THE ALKALINE ROCKS OF PORT CYGNET, TASMANIA

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APPENDIX VOLUME

- C O N T E N T S -

APPENDIX 1	SOME TYPICAL SYENITE ASSOCIATIONS AND OCCURRENCES
APPENDIX 2	X-RAY FLUORESCENCE ANALYTICAL DATA
APPENDIX 3	NORMATIVE DATA
APPENDIX 4	ELECTRON MICROPROBE DATA
APPENDIX 5	SPECIMEN LIST
APPENDIX 6	GEOLOGICAL AND LOCALITY MAPS

APPENDIX I

SOME TYPICAL SYENITE ASSOCIATIONS AND OCCURRENCES

Syenites, and their related rock types show a diversity of occurrences and associations in nature. In this section it is proposed to summarize their characteristics, particularly with respect to those which might have origins comparable with the Port Cygnet alkaline rocks.

GNEISSOSE SYENITES AND SYENITES ASSOCIATED WITH METAMORPHIC ROCKS

Alkaline syenites can form in metamorphic terranes as granular, foliated or gneissic rocks, which may in fact represent earlier igneous rocks subsequently metamorphosed by later events.

Some of the more important metamorphic gneisses from the following areas are generally representative of these rocks.

Haliburton-Bancroft Area of Canada

Gittins (1961), Appleyard (1967, 1969) have described these rocks as being metasomatically recrystallized Grenville metasediments. Transformations were caused by a nepheline syenite magma which according to Appleyard was synchronous with the deformation and recrystallization. Payne (1968) considers most of the rocks as intrusive masses with foliation in the rocks being produced by flow alignment of minerals in the original intrusion. The syenites have higher soda than potash (approximately 2:1). Trace element concentrations are as follows:- Rb: 33-85 ppm, Sr: 23-88 ppm, Ba: 19-84 ppm, Zr: 5.6-88 ppm, which makes them unique when compared with other groups of alkaline rocks.

Gittins (1961) considered the rocks of the area to be regionally metamorphosed metasomatic (nephelinized) rocks and also igneous rocks. Gittins showed specifically a reciprocal relationship of ($Na_2O + K_2O$) with CaO for metasomatized igneous rocks, but no relationship for the metasomatic nepheline rocks.

Syn-Orogenic Rocks of Eastern Ontario and Northern Norway

In discussin the occurrence of both gneissic and massively textured alkaline rocks in linear belts within the Grenville tectonic province of eastern Ontario and the Caledonian fold belt of west Finmark, northern Norway, Appleyard (1974) came to the conclusion that the magmas of both regions were miaskitic suggesting a common genetic mode but with independent evolution of magmas at a number of localities. Appleyard thought that the Ontario rocks may have formed from anatexis of supra-crustal metasediments including marble quartzo-feldspathic gneisses and para-amphibolites with evaporites in the assemblage acting as a fluxing agent.

Appleyard does not rule out a mantle origin but prefers the former model. With regard to the west Finmark complex, because of the high barium and strontium coupled with a relatively low rubidium value, Appleyard prefers a mantle origin for these with the initial process being anatexis within the mantle, followed by a complex process of fractionation of a miaskitic magma.

Mbozi, Tanzania

This is a two feldspar gneiss with aegirine-augite, amphibole and quartz or nepheline. It is associated with the Mbozi syenite-gabbro complex and was considered by Brock (1968) to be formed by volatiles and solutions from the nepheline syenite metasomatizing

quartzo-feldspathic metasediments of the Ubendian gneisses.

Analysis of marginal rocks:

	Syenite from Mbozi	Late Syenite Dyke
SiO_2	61.97	56.90
TiO_2	0.90	0.27
Al_2O_3	18.06	20.41
Fe_2O_3	1.54	2.96
FeO	1.54	2.75
MnO	0.10	0.27
MgO	0.95	0.24
CaO	1.51	1.20
Na_2O	6.57	8.16
K_2O	6.22	6.20
P_2O_5	0.39	0.05
H_2O^+	0.23	0.36
H_2O^-	0.11	0.06
	100.09	99.83

Brock came to the conclusion that because of the spread of values for the A.F.M. plot of the Mbozi syenites, they did not represent a simple differentiation series.

The Kilonwa Syenite, Tanzania

This syenite is a gneissose syenite occurring on Waswankha Hill, northeast of Chilonwa in central Tanzania and has been briefly described by Kempe (1968). The hill north of this locality consists of sheared syn-orogenic granite, amphibolite and hornblende-epidote-biotite schists. Kempe considers the syenite to be of igneous origin and of interest as a gneissose syenite occurring as a small isolated mass in a highly metamorphic terrane, with the gneissose structure being the result of shearing and cataclasis. According to Kempe there is evidence of other small syenitic bodies throughout the region.

The typical mineralogy is of large perthitic alkali feldspars in a groundmass of granulated albite and perthite with bands of ferromagnesian and accessory minerals. The ferromagnesian minerals vary with dark brown biotite always present. This may or may not be sub-

ordinate to pale green aegirine and alkali amphibole. The rocks are slightly oversaturated and soda always exceeds potash. The range of analyses is represented by the following:

SiO_2	64.28	61.65
Al_2O_3	17.33	14.73
Fe_2O_3	2.63	4.56
FeO	1.16	3.68
MnO	0.03	0.20
MgO	0.22	0.70
CaO	0.03	1.87
Na_2O	7.36	6.69
K_2O	5.47	4.65
H_2O^+	0.73	0.58
TiO_2	0.38	0.52
P_2O_5	0.18	0.17
	99.80	100.00

Kishangarh, India

At Kishangarh are banded amphibolite-nepheline two feldspar gneisses. These are enclosed by metasediments and diorite-gneiss and were formed by metasomatic transformation of gabbro. The process was one primarily of addition of soda and alumina plus some potash. Niyogi (1966) claims the process at Kisangarh was essentially one of alkalinization akin to granitization. The alkali gneisses are highly alumina oversaturated. The following is a typical analysis of alkali gneiss from this locality.

SiO_2	54.52
TiO_2	0.00
Al_2O_3	24.32
Fe_2O_3	6.62
FeO	0.00
CaO	1.71
MgO	0.43
Na_2O	10.62
K_2O	1.60
	99.82

The alkaline syenite gneisses are characterized by variable trace elements, however where a more albite-rich plagioclase and a potash

mica phase are present the values for strontium and barium could increase. Chemical trends are not clearly defined as for "more normal" igneous rocks.

Shaki, Nigeria

Oyawoye (1967) has described the petrology of a potassic syenite and its associated biotite pyroxenite, from Shaki in western Nigeria. A syenite gneiss with oval outcrop, about 14 miles long is elongated nearly parallel to the north-south structural trend of the surrounding country rock which is a biotite-muscovite gneiss. The biotite pyroxenite occurs as patches of varying sizes widely distributed throughout the syenite. Trace elements are characteristic of both magnesian ultrabasic rocks and granitic rocks. The trace element concentrations are remarkably uniform in both rock types except for zirconium and strontium which show a strong antipathetic correlation with each other.

Some trace elements of interest are strontium (1000 ppm), barium (2000-3000 ppm), lanthanum (200-300 ppm), nobium (0-20 ppm), yttrium (20 ppm). Oyawoye believes both rocks were formed by two metasomatic processes, one involving Ca+FeO+MgO and the other K_2O in a process akin to fenitization. Pyroxenes are identical in both rock types with some degree of development of amphibole.

Oyawoye states that chemically the syenite is between the biotite pyroxenite and the surrounding biotite muscovite gneiss with the chemical character being largely derived from the biotite pyroxenite. The zoned distribution of pyroxene and amphibole in the syenite with pyroxene in the core and amphibole on the outside is consistent with the influence of chemical or temperature gradients. In the intermediate zone where pyroxene and amphibole occur together the amphibole

in many cases has crystallized first to be followed later by pyroxene. This would indicate a rising temperature gradient such as would occur where there is a flow of heat from a centre. The inference is that the Shaki syenite had an origin resembling the process of contact metasomatism and essentially formed by feldspathization of the basement gneiss.

Analyses of Shaki syenite:

	Amphibole-rich syenite	Pyroxene-rich syenite
SiO	60.80	59.10
TiO	0.80	0.80
Al O	14.30	13.50
Fe O	1.10	1.30
FeO	3.30	2.90
MnO	0.10	0.10
MgO	3.80	4.70
CaO	4.00	5.30
Na O	2.50	1.90
K O	8.30	9.10
P O	0.40	0.40
H O$^+$	0.60	0.60
Total	100.00	99.70

Kunararam, India

The Kunararam series is a group of alkaline rocks from the Khammam district, Andhra Pradesh, India. These have been described by Subbarao (1971). Syenite and nepheline syenites have been emplaced in highly folded metamorphosed igneous and sedimentary rocks of the eastern Ghats of south India. The syenites originated from two independent magmas each of which had its own fractional crystallization series. They were subsequently metamorphosed and also caused metasomatic action on the country rocks. Soda is greater than potash. The nepheline syenites are associated with pyroxene-, hornblende-, and biotite-nepheline-syenite variants. The syenites have pyroxene-, amphibolite-, and biotite-syenite and syenodiorites.

Granite gneisses and amphibolites also occur. The syenites occur as irregular patches and often show gneissic banding. Biotite melteigite patches in the nepheline syenite are interpreted as indicating that the melteigite was a primary magma. Subbarao also suggests that some of the nepheline-bearing syenodiorites and syenites have formed from the metasomatism of pre-existing rocks such as the garnetiferous biotite gneiss.

Glen Dessary Area, Scotland

Described by Richardson (1968), and thought by him to be a pre- or synmetamorphic intrusion with Caledonian age metamorphism, the features of this complex, which has an oval shape with the minor axis about one mile and the major axis about two miles, are a leucocratic syenite surrounded by a more mafic syenite with an association of ultramafic rocks whose precise field relationship to the syenites is not obvious from the map. The mafic syenites have been intruded in a complex way, by granitic pegmatites whose time sequence has not been determined. The contacts of the various rock units are very sharp and are considered igneous intrusions on this basis.

There is evidence of some feldspathic rocks intermediate between the ultramafic rocks and the mafic syenites. The syenites are very slightly oversaturated with free quartz rare and feldspathoids are absent. Richardson considers the sequence to be one of differentiation beginning with the ultramafic rocks through the mafic syenites to the leucocratic syenites. The main differences between the two syenites is the relative amounts of alkali feldspar to the dark minerals (principally biotite, pyroxene, hornblende and magnetite). The ultramafic rocks are composed mainly of pyroxene and hornblende. No complete gradation to mafic syenite can be seen but up to 25% feldspar may be

present in some ultramafic rocks. Pyroxene and hornblende occur in the syenites. Pyroxenes are aegirine augites.

Typical analyses of rocks from Glen Dessary:

	Mafic Syenite	Leucocratic Syenite	Ultramafic Rocks
SiO_2	56.23	59.82	43.72
Al_2O_3	15.50	16.77	7.00
TiO_2	1.03	0.80	1.40
Fe_2O_3	2.59	2.38	5.62
FeO	4.80	1.89	10.95
MnO	0.15	0.04	0.34
MgO	3.20	1.06	10.88
CaO	6.03	2.44	15.08
Na_2O	3.10	5.52	2.04
K_2O	5.49	6.16	1.03
P_2O_5	0.63	0.16	0.98
H_2O^+	0.39	-	1.00
	99.14	97.04	100.14

SYENITES IN LAYERED INTRUSIONS

Klokken Gabbro-Syenite Complex, South Greenland

This complex is part of the Gardar Province of southwestern Greenland. It is a small stock, about 4 km in diameter and is described in part by Parsons (1979). Essentially the syenites have had a relatively complex history but nevertheless represent a differentiated gabbroic parent. The initial ratio for strontium isotopes of this complex is 0.7031 ± 0.003 which is considered to be consistent with an origin from primitive mantle material. The age of this complex is given at 1159 ± 11 Ma (Rb-Sr isochron, Blaxland and Parsons, 1975). The liquid line of descent suggested by Parsons for these rocks, is shown in Fig. VI-

Kiglapait Layered Intrusion, Labrador

Morse (1969) describes this as a Precambrian layered intrusion of probably lopolithic form. The rocks are mainly gabbroic types

with differentiates to ferromonzonite, ferrosyenite and ferrodiorite.

Kangerdlugssuaq Alkaline Intrusions, East Greenland

There is little rhythmic layering here but igneous lamination, due to platy feldspars in the rocks, is present (Wager, 1965). The age is 50 Ma and represents a differentiation sequence in which both oversaturated and undersaturated rocks have evolved. This may be due to increase in P_{H_2O} in the evolution of the residual liquids. Soda is greater than potash in this intrusion. The intrusion is about 33 km in diameter with series of regular rings comprising its structure. The sequence from the periphery to core begins with nordmarkite passing gradually into syenite free from quartz, syenite with feldspathoids to an innermost foyaite. The intrusion is layered and formed probably by crystal fractionation.

Average composition of Kangerdlugssuaq alkaline intrusion:

SiO_2	65.4		
TiO_2	0.71		
Al_2O_3	16.99	C.I.P.W.	Norm:
Fe_2O_3	1.40		
FeO	1.83	Qtz	5.33
MnO	0.12	Or	30.74
MgO	0.54	Ab	54.83
CaO	0.86	An	1.92
Na_2O	6.48	Di	1.02
K_2O	5.20	Hy	2.10
H_2O^+	0.22	Mt	2.03
H_2O^-	0.08	Il	1.35
P_2O_5	0.17	Ap	0.40
	100.00		

Ilimaussaq, Greenland

This complex has both oversaturated and undersaturated types with gabbros, syenogabbros and augite syenites occurring with both types (Ferguson, 1970). Once again the evidence of volatiles, particularly fluorine is probably significant in the production of

both sequences. Rare and complex silicates occur in these rocks also. Soda is greater than potash with pyroxene enrichment of zirconium, gallium and niobium. Barium occurs at 1490 ppm in the augite syenite but is highly depleted in the other rocks. Rubidium is not significantly fractionated ranging from 109 ppm to 220 ppm for all rock types. The augite syenite has 19.5 ppm Rb although the K/Rb ratio shows a decrease consistent with a differentiation trend.

Kungnat

Kungnat (Upton et al., 1960, 1971) shows a sequence from olivine gabbro-ferrosyenogabbro-augite syenite-quartz syenite-alkali granite. Na_2O is equal or greater than K_2O. This is a central complex with dimensions about 5 x 2 km.

The above are part of the Gardar Province and are agpaitic type syenites.

Khibiha and Lovozero Massifs, Kola Peninsula

These are described by Kogarko and Polyakov (1967) who show that in common with most of the nepheline syenites of the Kola Peninsula, there is a definite relationship with ultramafic and mafic rocks. The ages range from 400 Ma to 200 Ma. Kogarko and Polyakov claim that the rocks formed as differentiation crystallization of an alkali basaltic magma with formation of oversaturation of alkalies relative to aluminium as a result of the plagioclase effect and formation of Tschermak's molecule in the pyroxenes.

Stjernøy, Northern Norway

The nepheline syenite on Stjernøy, described by Heier (1961, 1964) is part of a sequence in which occur layered gabbro, hornblendite,

carbonate, and nepheline syenite. The gabbros are gneissic and layered or banded. One of the gneissic gabbros is associated with syenitic and quartz-rich gneisses. The layering of the gabbros is produced by concentrations of dark minerals in streaks and bands and indistinct and gradual contacts with adjacent leucocratic bands. The gabbro has no definite side walls and extends without a clear break into the contiguous and analogously layered amphibolite-gneiss complex.

To the south the gabbros have been intruded by a carbonatite body, and have been altered to pyroxenite and hornblendites. Periodotitic rocks occur within the gabbros and gneisses and these have had their outer parts serpentinized. All gradations between hornblendite and gabbro gneiss occur and the contacts are always transitional. The carbonatite was potash-rich and was considered to have altered and metasomatized the gabbros. The carbonatite contains biotite in the central area. Nepheline syenite is later than the carbonatite. Syenite occurs within the layered gabbros. Heier suggests the syenite magma formed as a rest magma by accumulation of aluminium and alkalis with the volatiles responsible for the formation of carbonatite and syenite and metasomatizing of the earlier gabbros. The later layered gabbro represented the basic fraction of the crystallizing magma.

The outstanding features of the nepheline syenite here are the extreme enrichment of strontium and barium and the extreme impoverishment of zirconium, scandium, and rare earths (La and Nd), yttrium and rubidium. The potassium/rubidium ratio is about 577 indicating a rubidium depletion. The initial strontium isotope ratio is 0.7036 for the associated carbonatite. Heier regards the rocks as having a deep-seated origin with an associated vapour phase removing volatile elements such as rubidium, cesium, lead and thallium.

Analysis of nepheline syenite from Stjernøy (Heier, 1964):

	Nepheline Syenite	CY19	CY123
SiO_2	52.73	58.95	58.63
TiO_2	0.51	0.29	0.21
Al_2O_3	23.71	18.92	20.91
Fe_2O_3	1.89	2.33	1.23
FeO	1.04	0.71	1.11
MgO	0.24	0.13	0.32
MnO	0.06	0.15	0.10
CaO	2.54	3.59	2.74
Na_2O	7.78	4.71	6.74
K_2O	8.08	7.88	7.95
P_2O_5	0.05	0.02	0.06
CO_2	0.77	-	-
H_2O^+	0.26	2.52	0.20
	99.66	100.20	100.20

The Stjernøy nepheline syenite has excess alumina and deficient silica when compared with the Port Cygnet rocks otherwise they are very similar with respect to the other major elements. With zirconium less than 10 ppm in most specimens with a maximum of 80 ppm, this element is very depleted in the rock. The rare earth elements are much more abundant at Cygnet (Table V-1). Thus with respect to Stjernøy there is greater rubidium however the K/Rb value of 258 (for Cygnet) suggests a slight depletion of rubidium when compared with the crustal average of about 230. The values of scandium and yttrium for Stjernøy were below the detection limits at 1 ppm and 5 ppm respectively whereas the Port Cygnet rocks have an average of 7 ppm for scandium and 25 ppm for yttrium.

The trace element data for the Stjernøy nepheline syenite show some significant differences from the Port Cygnet rocks and while the Port Cygnet rocks are not obviously directly associated with the same rocks as at Stjernøy it does not seem impossible that the latter might well have been produced by the partial melting of gabbroic rocks due to an associated intrusion.

SMALL VOLCANIC AND INTRUSIVE STRUCTURES

Kila-Warji Ring-Complex, Nigeria

This complex which has been described by Turner (1968), is of Jurassic age, occurring in the basement rocks of northern Nigeria and consists of two distinct parts. The northern part (Kila) is a ring complex of almost superimposed ring structures. The Kila ring complex is about 8 km in diameter and consists of four centres of steep sided ring structures of which the sequence is: 1 - porphyritic trachyte, and aegirine-arfvedsenite granite, 2 - syenite and rhyolite core sheets, 3 - quartz syenite porphyry, quartz porphyry, feldspar porphyry, and microgranite, and 4 - aegirine granite.

The southern part of the structure is named the Warji ring complex. This complex is composed of acid and intermediate volcanic rocks succeeeded by intrusions of syenite and granite. The sequences here are: 1 - early volcanic rocks, mainly welded tuffs, agglomerates, rhyolites and trachytes, 2 - a plutonic cycle including porphyritic syenite, hornblende, granite prophyry and riebeckite granite, 3 - the final volcanic episode consisted of two small trachytic plugs, about 2000 feet in diameter having an outer ring of porphyritic syenite and a core of fine variable trachyte which contains xenoliths of basalt and basement rocks.

The association here is with granitic rocks although the presence of basaltic xenoliths in the trachyte of the final volcanic episode may indicate a different mode of formation for those rocks.

The Rainey Creek Alkaline-Ultramafic Igneous Complex, Northwest Montana

The Rainey Creek complex is an approximately circular stock-like intrusion, about 3 miles in diameter, consisting of concentric zones of magnetite pyroxenite, biotite pyroxenite and biotite arranged in inward succession. An irregularly shaped syenite body, approximately 1.5 miles maximum dimension, lies on the southwest side of the ultramafic complex. A further small body of nepheline syenite lies southwest of the larger mass. The complex has intruded Precambrian basement rocks and is Cretaceous in age (84 Ma). The geology is described by Boettcher (1967). The succession began with the replacement of coarse grained biotite pyroxenite having a core of biotite caused by the accumulation of alkalies and volatiles near the roof of the pyroxenite-pluton. Following this phase a boundary ring dyke of magnetite pyroxenite was formed. The ultramafic rocks were formed by fractional crystallization of a parent magma. No chemical details of the syenite are given by Boettcher.

Girnar, India

The Girnar igneous complex from the Deccan volcanic province, India, was described originally by Bose (1973) and also by Paul et al. (1977). The complex consists of an outermost gabbro with diorites occurring towards the centre and having syenite and lamprophyric rocks occurring as minor intrusions in the form of dykes and veins. The complex is surrounded by silicic porphyritic rocks which have a regional distribution throughout western India. Strontium initial ratios are variable and indicate mixing or contamination as part of the history of crystallization of the rocks. The gabbro-diorite-syenite-lamprophyre form a cogenetic relationship distinct from the silicic porphyry. The K-Ar ages range from 63.6 Ma for the gabbros to

56.7 Ma for the lamprophyric rocks whereas the Deccan basalts are older than 64 Ma in this area, thus the Girnar complex rocks were emplaced immediately after the Deccan basalts in this region.

Aden Volcanic Suite

The peralkaline rocks of Aden (Cox et al., 1970) forming the Aden volcanic suite are interpreted as having an alkaline olivine basalt as a parental magma which fractionated producing a series terminating with trachytes and rhyolites. The trace elements produced by this differentiation can be compared to the Port Cygnet trachytic rocks. In the Aden rocks lanthanum, niobium, yttrium and zirconium are greatly enriched relative to the Port Cygnet rocks whereas barium, strontium, and to a lesser extent, rubidium are depleted. This is a typical situation with respect to a well evolved, highly fractionated sequence produced from a mafic parental magma. The K-Ar age for these rocks is about 5.0 ± 0.5 Ma but the strontium-rubidium isochron plot suggests an age of 30-40 Ma with initial ratios varying 0.7088 to 0.7072. The interpretation of these data is that the Aden rocks could be related to a thermal event which occurred some time (i.e. 30-35 Ma) before the eruption of the magmas.

Loch Ailsh, Scotland

The Loch Ailsh intrusion, Assynt, Scotland (Phemister, 1926; Parsons, 1965) forms an approximately rectangular complex covering about 5 square miles. Phemister interpreted the complex as a stratified laccolite which had differentiated prior to intrusion but had a downward stratigraphic sequence beginning with an ultra-leucocratic alkali feldspar rock (perthosite), leucocratic alkali feldspar rock with from 3 to 30 percent mafic minerals (including aegirine augite

biotite and riebeckite), shonkinites and hybrid rocks (basic diopside-biotite-alkali feldspar rocks) and ultrabasic biotite-pyroxenite and hornblendite. The whole group was cut by a later plug of aegirine melanite syenite. The age is pre-Caledonian and the rocks intrude Cambrian succession. The syenites are exceedingly feldspathic and there is evidence of multiple intrusion of the syenite. The intrusions are regarded as a differentiated series crystallizing between 1060°C at 1 kb and 750°C at 3 kb pressure. Later work by Sabine (1953) interprets the diversity of composition of the syenites as being due to two distinct phases of differentiation. Tilley (1958) also recognized four main rock groups on the basis of chemical analyses, from all the Assynt alkaline intrusions.

Square Top, Australia

The Square Top intrusion at Nundle, New South Wales, is a plug-like body showing a differentiation sequence from analcime-olivine theralite to analcime tinguaite. The mafic variants are confined to the lower third of the intrusion. Felsic differentiates and alkali enrichment predominate in the petrochemical trend and crystallization history. The intrusion is a representative of the northeast New South Wales Tertiary volcanic province in which alkali olivine basalts and related types and their derivatives predominate. The tinguaite is described by Wilkinson (1965) as being porphyritic with phenocrysts of diopsidic clinopyroxene, olivine and nepheline. Alkali feldspar laths in the groundmass frequently have a trachoid texture with anhedral grains of green clinopyroxene occurring interstitial to the feldspars in the groundmass. Phenocrysts of calcic anorthoclase may also be present. The tinguaite does not have the more typical felted needle-

like green pyroxenes of the classic tinguaites.

Magnet Cove, U.S.A.

Magnet Cove, Arkansas (Erickson and Blade, 1963) is a ring dyke complex about 3 miles in diameter, post-Mississipian in age, intrusive into folded Palaeozoic sedimentary rocks of the Ouachita geosyncline. The igneous rocks of the complex consist of two major groups on the basis of the presence or absence of feldspar. The rock types containing feldspar are: phonolite, trachytes, tinguaite, syenites including pegmatites, alkali, gabbro and aplites. The igneous rocks in which feldspar is absent include jacuparingite, sphene, pyroxenites, ijolite, melteigite, fourchite and carbonatite which occurs as irregularly shaped bodies in the central part of the complex. A feature of the rocks is the high concentration of niobium in the syenite. Dykes outside the complex consist of pegmatite, aplite, syenite, trachyte porphyry, trachyte, tinguaite, andesite, diorite, monzonite and lamprophyre. The order of intrusion begins with phonolite and trachyte followed by jacuparingite, alkali syenites, ijolites, carbonatite dyke rocks and veins. Black titanium garnet in the syenites is observed to alter to sphene by release of iron which probably forms a deuteric green biotite in the rock. Inclusions in the rock include metamorphosed sediments, ijolite and melteigite fragments. The authors believe the complex was derived by differentiation and fractional crystallization of a residual magma of a mafic phonolite composition rich in alkali lime and volatiles. The residual magma is thought to have been derived by fractional crystallization from a regional undersaturated olivine basalt magma. Some analytical data for the rocks from this complex are:

	Tinguaite	Nepheline syenite	Trachyte
SiO_2	52.85	52.00	53.89
Al_2O_3	19.44	20.80	21.63
Fe_2O_3	4.82	2.36	1.74
FeO	0.57	1.15	1.82
MnO	0.37	0.22	0.15
MgO	0.13	0.28	0.43
CaO	2.53	2.86	3.08
BaO	0.35	1.52	0.08
Na_2O	8.87	7.87	6.62
K_2O	7.96	8.18	7.80
H_2O^+	0.78	1.00	1.09
TiO_2	0.33	0.24	0.60
P_2O_5	0.04	0.05	0.08
	99.62	98.78	99.34

Litchfield, U.S.A.

Barker (1965) described the alkaline rocks from Litchfield, Maine. These form a composite pluton emplaced by forceful intrusion and stoping. There are five alkaline rock types here, which have been intruded in the order: sugary-textured leucosyenite, magnetite-biotite syenite, nepheline syenite, foliated mafic syenite and albitite pegmatite. The rocks were partly differentiated at their time of intrusion and there had been some assimilation of the country rock with the production of quartz syenite. The country rock consists of biotite-quartz schists, gneisses and calc-silicate plagioclase-quartz granulite, however there is no evidence as to the nature of the parental material from which the nepheline syenite has evolved although the White Mountain magma series, of which these rocks are thought to be part, do show a series from gabbros through granites to syenites (Chapman and Williams, 1935). Streaks of nepheline syenite occur in the biotite schist. The albitite pegmatite is interesting in that it may have formed by partial melting of the gneiss. Epidote forms small clusters of prismatic crystals around the albite. A small dyke of olivine basalt cuts metasediments, granitic rocks and nepheline syenite.

Diablo Plateau, U.S.A.

The Diablo Plateau area of the northern Trans-Pecos magmatic province of Texas and New Mexico has shallow intrusive bodies consisting of quartz-bearing and feldspathoidal syenite, trachyte and phonolite. The age is 35 ± 2 Ma. Barker et al. (1977) claim that all intrusive rocks are derived from one magma reservoir. The intrusives are divisible into two groups: the older one consisting mainly of sills and laccoliths is fine to coarse grained with virtually no flow structure, low Rb, high Sr and initial $^{87}Sr/^{86}Sr$ of 0.703-0.709, while the younger one is porphyritic, forms discordant sheets, has a flow structure and high Rb and low Sr. Overall there are about 22 intrusions. The variation of strontium is interpreted as being due to deuteric alteration by the action of groundwater. On the basis of gaps in the differentiation indices, it is considered both saturated and undersaturated magmas were present in the magma reservoir. These rocks show no direct evidence of the parent magma. The trace element data for strontium suggest that the rocks are part of a highly fractionated sequence. The maximum whole rock strontium is 880 ppm, but the range for all the others is from 22 ppm to 338 ppm with most values below 200 ppm. The normative compositions for the rocks plot on the thermal divide for feldspars-feldspathoids with the ultimate evolutionary trends being split by this.

Phalaborwa Complex, Tzaneen, N.E. Transvaal

The Phalaborwa complex consist of a central volcanic complex of carbonatite, phlogopite-bearing pegmatoids, phoscorite, pyroxenite, feldspathic pyroxenite and a large number of satellite plugs of feldspathic pyroxenites and syenites. It is dated at 2060 Ma. Frick

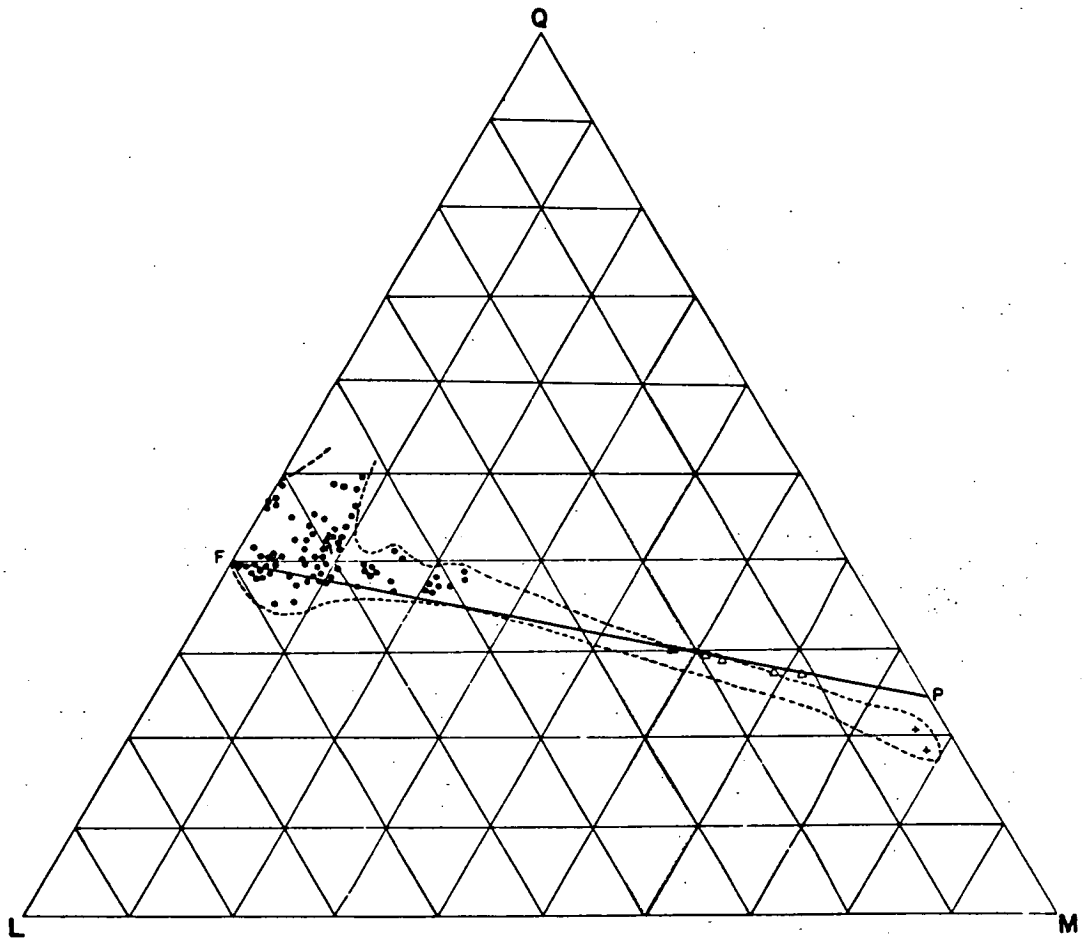


Figure AI-1 Niggli Q-L-M plot for the Phalaborwa Complex showing the relation between syenite (o), feldspathic pyroxenite (Δ) and pyroxenite (+) (from Frick, 1975).

(1975) has described small satellite syenite intrusions associated with the above complex. The association of syenites rather than ijolites with the carbonatite is regarded as unusual. It is considered that the magmatic lineage at Phalaborwa became K-enriched rather than Na and consequently fractionated to a trachytic end point rather than to a phonolitic one. A Q.L.M. plot for the Phalaborwa rocks (Fig. AI-1) shows a distinct relationship between the pyroxenite, feldspathic pyroxenite and the syenites. Within the syenite plugs Frick has described the common occurrence of mafic xenoliths consisting predominantly of biotite and amphibole which are interpreted as of original migmatite from which the quartz and feldspars have been melted out and incorporated into the syenite magma.

The trend plotted for the pyroxenites, feldspathic pyroxenites and syenites by Frick on the Niggli-Burri Q.L.M. diagram show a similar trend to the Port Cygnet syenites and their associated amphibolite inclusions (Fig. AI-2). Frick notes the trend and observes the discontinuities between the three main rock types. However, because of the association of the plug shaped vents around the periphery of Phalaborwa province with feldspathic pyroxenite and an outer layer of this material around the main pyroxenite body, Frick considers this to be similar to the primary magma from which the syenites crystallized. The apparent order of emplacement at Phalaborwa began with the pyroxenite and was succeeded by phlogopite pegmatoids, phoscorite, carbonatites and the syenites. A brecciated halo occurs around some of the syenites and contains fragments of various rock types such as leucogranite, biotite granite, granulites and amphibolites. Towards the centres of the plugs the contacts with the granite blocks become more diffuse and these become progressively more mafic. Frick considers the syenites to represent a

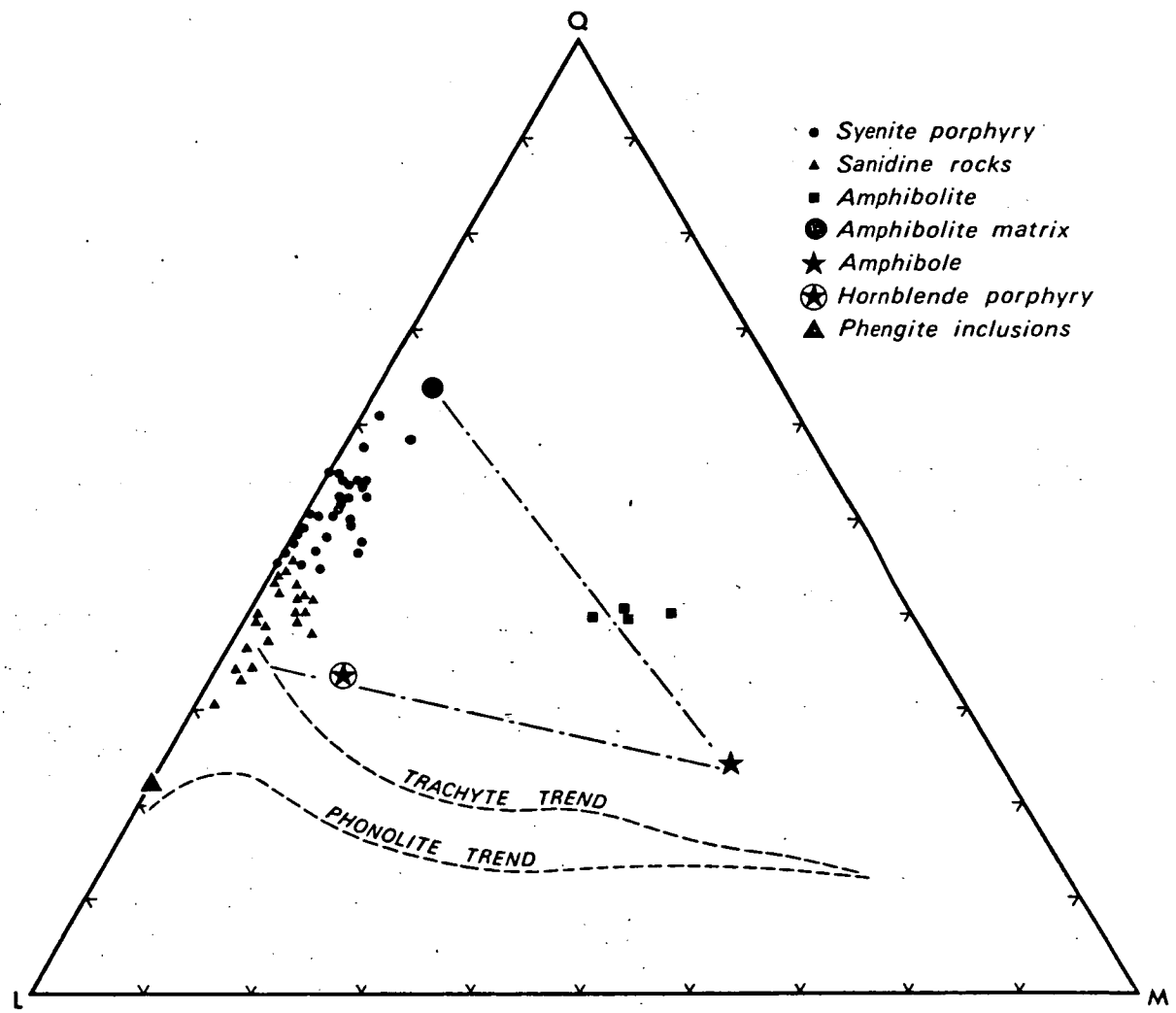


Figure AI-2 Niggli Q-L-M plot for the Port Cygnet alkaline rocks and their inclusions.

derivative of an original alkaline basalt which fractionated towards a trachytic rest magma. The feldspathic pyroxenite or a volcanic equivalent thereof such as shonkinite is considered to be the non-volatile phase of the parent magma that successively crystallized pyroxenites and syenites. The carbonatite of the complex is said by Frick to have an alternative origin which must be sought in another mechanism.

LARGE CENTRAL VOLCANIC COMPLEXES

Mt. Suswa, Kenya

This is a Quaternary volcano in the Rift Valley of Kenya, composed of mainly mildly peralkaline sodalite-trachytes, sodalite-phenolites. The mineralogy and petrology is described by Nash et al. (1969). These are lavas of large volume which the above authors considered to have been the products of at least three parental magmas. The lavas of the final episode show an order of eruption corresponding to increasing peralkalinity and undersaturation with respect to silica indicating that these were tapping a differentiating magma.

The trace elements from these lavas show great enrichment of zirconium (480-1630 ppm), niobium (1975-420 ppm), yttrium (60-175 ppm). Barium and strontium are depleted varying from 180 ppm to 1145 ppm and 10 ppm to 280 ppm respectively. Zinc concentrations vary from 135 ppm to 410 ppm. The strong depletion of barium and strontium together with the enrichment in the other elements is indicative of strong fractionation of the parent magma.

These lavas are from some depth in the mantle because of their widespread nature, recurring production and an environment not subject to crustal heterogeneities. The peralkaline characteristics of the

rocks do not favour an origin by fusion or major assimilation of normal crustal material which is alumina-rich and would be expected to lead to greater alumina in the resulting rocks. These lavas have soda greater than potash.

Eastern Uganda

In summarizing the petrogenesis of the alkaline igneous rock suites of eastern Uganda, King (1965) recognized a younger Tertiary group of extrusives and an older (Cretaceous) group of equivalent intrusive rocks. The complexes range in size from about $\frac{1}{2}$ mile across up to 60 miles for the Elgon volcano. The magnitude of these rocks particularly the lavas indicates a substantial upper mantle origin at least in part, for these rocks. King has the volcanic rocks forming by differentiation from nephelinites but following divergent trends. The syenites and nepheline syenites have formed as fenites by metasomatic processes and mobilization of these could have also produced corresponding trachytes and phonolites. Nepheline syenite and syenites have also formed from feldspathization of ijolites. The nephelinites might also have been derived from olivine basalts. The carbonatites associated with these rocks have high strontium (4000-5000 ppm) and low initial strontium isotope which King regarded as indicative of extreme differentiation from a basaltic parent.

South Kenya

In 1965 Wright recognized three sub-provinces in the volcanics of the southern half of Kenya. These were: (a) Miocene phonolite sub-province; (b) Mt. Kenya phonolite/basanite sub-province; and (c) rift valley trachyte/olivine basalt sub-province.

The lavas of these regions covered such a very large area (3°

latitude) that they must have a primary origin within the mantle, however, Wright considers there is too much salic material present to have been formed only by a normal differentiation process hence he comes to the conclusion that there must be progressive changes in the magmas brought about by assimilation.

Bearpaw Mountains (Hearn, Pecora and Swadley, 1964)

Many intrusive rocks occurring as dykes, plugs, sills, stocks, laccoliths or bysmaliths. Stages: shonkonite first (augite, K-feldspar, orthoclase and sanidine, microperthite) biotite inversely proportional to olivine. Nepheline is diagnostic of hyperalkalic varieties. Shonkonite older than porphyritic latite and porphyritic syenite is a late variety.

Many shonkonites have syenitic segregations. Rafted fragments of igneous and metamorphic rocks from the Precambrian basement are abundant in the eastern Bearpaw Mountains. The syenite and mafic syenite are gradational with the shonkonite. Potash feldspar and augite are the diagnostic minerals.

OCEANIC ISLAND ASSOCIATION

The oceanic island differentiates show an evolved fractional crystallization sequence ending with trachytic rocks, phonolites or other relatively silicic types. The details of these have been summarized by Burley (in Sorensen, 1974). For purposes of comparison it is only necessary to compare those of trachytic type with Port Cygnet. In Fig. AI-3 are shown trends for the Hawaiian Islands, St. Helena and Tristan da Cunha as these represent the most frequent differentiation trends for the oceanic islands. These show the

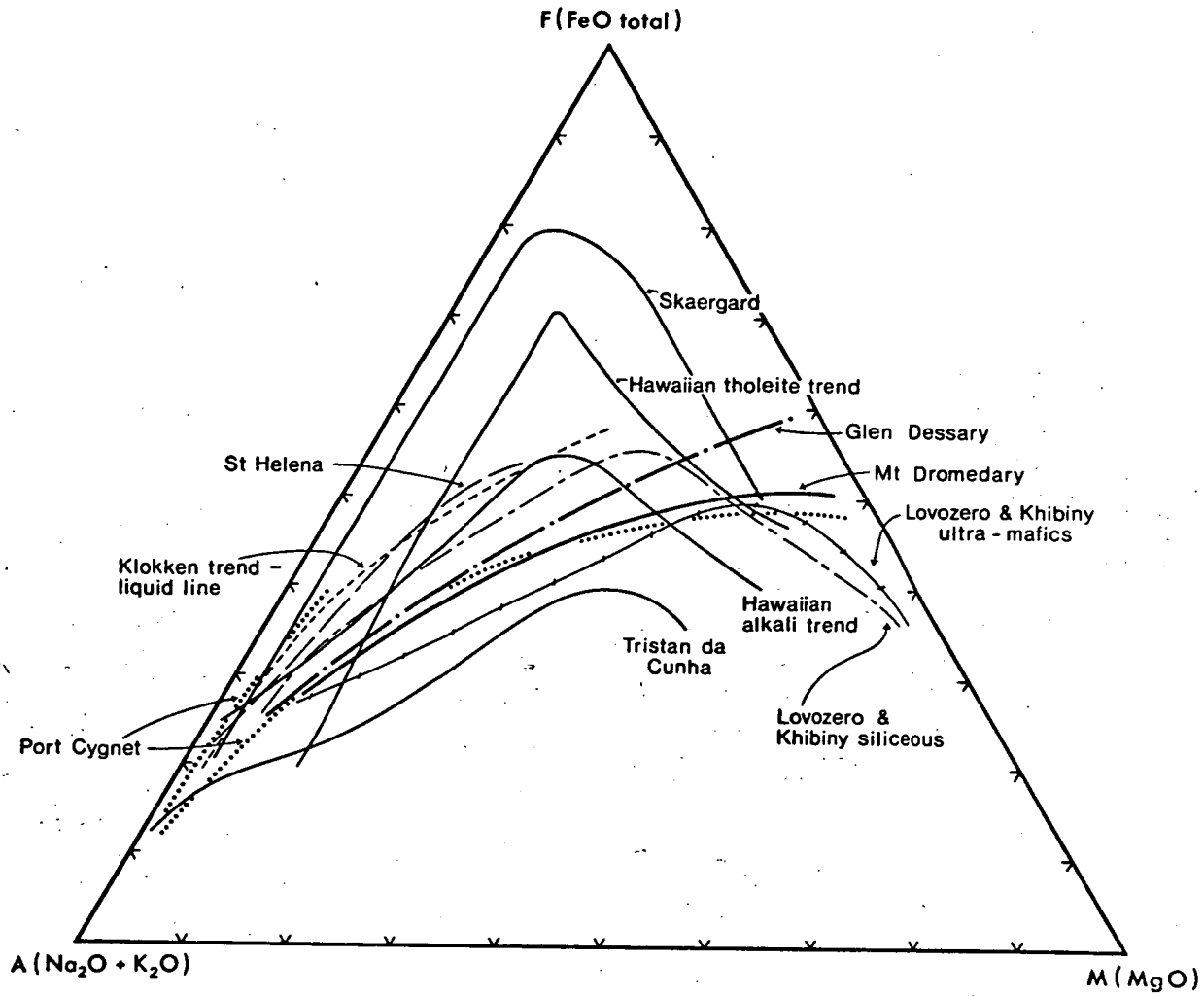


Figure AI-3 Comparative AFM plots for other areas with Port Cygnet plot added. Note the similarity of Port Cygnet (syenite porphyry) to Glen Dessary and Mt. Dromedary.

following trends: for Tristan da Cunha the trend is alkali basalt-trachybasalt-trachyandesite-trachyte (Baker et al., 1974). At St. Helena the sequence is alkali basalt-trachybasalt-trachyandesite-trachyte/phonolite with an undersaturated trend (Baker, 1968). For the Hawaiian Islands the alkali basalt trends to hawaiite-mugearite-trachyte (Yoder and Tilley, 1962). Tholeiite and nephelinite series (MacDonald and Katsura, 1964, 1968). When comparing the trachytic derivatives in the above sequences the outstanding features to be compared with Port Cygnet are that Na_2O is invariably greater than K_2O (Burley, in Sorensen, 1974) and usually but not always, the oceanic trachytes may contain more magnesia. The trace elements trends and concentrations particularly barium, strontium, and rubidium show typical evolutionary depletion in the oceanic rocks (e.g. Le Maitre, 1962), with these trends being influenced by the crystallization and removal of plagioclase. The initial strontium ratios for these rocks are usually less than 0.704.

UNUSUAL MINOR SYENITIC ROCK OCCURRENCES

Certain minor occurrences of syenitic rocks have been recorded in relatively unusual situations. Some of these are briefly described and a comparison made with the Port Cygnet rocks.

Mt. Elephant

Le Maitre (1974) showed that small patches of brown glass found in blocks of granite erupted, in basaltic scoria at Mt. Elephant, Victoria, were formed by the partial fusion of biotite and quartz. A typical electron microprobe analysis from Le Maitre's sample E3 is as follows and is compared with a syenite from Cooma (Joplin, 1964) and Port Cygnet examples (CY120 and CY70).

			Cooma		CY120	CY70
SiO_2	63.70		63.02		65.31	65.89
TiO_2	0.05		0.35		0.39	0.34
Al_2O_3	18.40		16.73		18.00	17.56
FeO	4.90	$FeO+Fe_2O_3$	5.15	$FeO+Fe_2O_3$	2.70	3.62
MgO	0.90		0.49		0.94	0.59
CaO	1.10		2.32		4.37	2.49
Na_2O	3.70		4.74		4.62	4.82
K_2O	7.00		5.79		3.42	3.71
	99.75		98.59		99.75	99.02

Brookville, New Jersey

Barker and Long (1969) described an unusual occurrence of feldspathoidal (nepheline and analcime) syenite in a quartz diabase sill from Brookville, New Jersey, U.S.A. The syenite is mixed with a granophyre which formed by fractional crystallization of a basaltic magma and accumulated near the top of the sill. The syenite contains inclusions of hornfelsed argillite showing no obvious preferred orientation. The diabase sill has intruded a fine grained argillite country rock. These authors consider that the granophyre formed in the usual way as a residual melt from the crystallization of the diabase and that this caused melting of the argillite which then assimilated some of the granophyre to produce the feldspathoidal syenite. This is an unusual occurrence and Barker and Long make the point that their enivsaged mechanism for the Brookville syenite is not necessarily applicable to other alkaline rocks. The outstanding feature of the Brookville syenite is its high soda content. The analysis is as follows and is comparable with CY44 which is one of the grey, groundmass rocks.

	Brookville Syenite	CY94
SiO_2	54.68	56.41
TiO_2	0.79	0.27
Al_2O_3	21.63	20.42
Fe_2O_3	2.22	2.16
FeO	2.00	0.56
MnO		0.13
MgO	1.25	0.50
CaO	2.86	3.36
Na_2O	7.03	6.33
K_2O	4.58	7.17
P_2O_5	0.28	0.11
loss	2.37	1.48
	99.69	98.90

The outstanding feature of the Brookville syenite is the high soda and relatively low potash contents of the rock. Once again it is to be noted that although this is a restricted occurrence there are numerous inclusions of the parent argillite in the syenite and some sign of these should appear if the Port Cygnet rocks had a similar origin. Also, of course, there should be some evidence for the original magma from which the process began.

Berkshire Valley, New Jersey

In another part of New Jersey to the east of the area detailed above, Young (1972), has described a sheet of quartz syenite intruding gneisses, metamorphosed to hornblende granulite subfacies in the Precambrian highlands. The unit immediately surrounding the quartz syenite is composed chiefly of pinkish well-foliated, medium grained hornblende granitic gneiss. Young came to the conclusion that the syenite was probably formed by anatexis of deep crustal rocks. However he did not rule out the possibility that it may represent the extreme fractionation product of a basic magma. The latter suggestion is based on the association of an olivine (Fa_{95}) with quartz which by analogy with the Red Hills intrusion (McDougal, 1962) indicates an

extreme type of fractionation. Young does not present suitable data to unequivocally resolve the above alternative. An analysis of this syenite is:

SiO_2	63.10
TiO_2	1.00
Al_2O_3	14.90
Fe_2O_3	0.80
FeO	5.30
MnO	0.18
MgO	0.21
CaO	2.90
Na_2O	4.50
K_2O	5.60
P_2O_5	0.11
loss	1.05
	99.30

When compared with Port Cygnet syenite porphyries the alumina is low and the iron oxides high. Titania and potash are also slightly higher.

Parjarito Mountain, New Mexico

Kelley (1964) described Precambrian (1155-1190 Ma) alkaline rocks at Parjarito Mountain, New Mexico. At this locality there is an old dark coloured hornblende syenite having schistosity in some parts. After metamorphism this was subjected to granitizing or recrystallization processes which invaded the mass widely and variably. In some places small feldspar metacrysts and veinlets developed in the hornblende-rich host. In other places large areas were conerted to a pinkish or greenish hornblende syenite. Contacts between this and the host rock are gradational through zones of incipient and scattered metacrysts. The hornblende syenite apparently displays a reverse order of crystallization with euhedral feldspars against interstitial amphibole. The old dark syenite has yellow-brown-green amphibole and blue-green riebecktite with orthoclase and plagioclase (An_{32} = andesine) with

occasional quartz. The invading syenite has plagioclase (An_{30} = andesine-oligoclase), microperthite-rare quartz and brown-green hornblende. Some pagmetitic phases have also been developed. While Kelley appeals to a granitizing process for the formation of the hornblende syenite and pegmatite, it does not seem unreasonable to postulate that a feldspar matrix of the old dark coloured hornblende syenite may have been remobilized and recrystallized by metamorphism.

At the end of the process, pegmatite dykes filled fractures due to late stage mobility with a build-up of fluids. Kelley has not published any analyses of the rocks of this area.

Rattlesnake Mountain, Texas

Carmen et al. (1975) described the petrology of the Rattlesnake Mountain sill, in the Big Bend National Park, Texas.

This feature is an early Tertiary analcime-bearing monzonite sill which underwent differentiation in situ such that there was a resultant systematic distribution of irregular masses of syenite throughout the body. Crystal settling was not a cause of the syenite because the central portion of the intrusion consists of a relatively mafic monzonite which is complementary in composition and amount to the enclosed bodies of syenite analyses.

	Plagioclase-rich syenite	Plagioclase-poor syenite
SiO_2	56.63	61.16
TiO_2	1.86	0.91
Al_2O_3	17.49	17.08
Fe_2O_3	3.51	2.45
FeO	3.22	2.25
MnO	0.14	0.11
MgO	1.60	0.74
CaO	3.59	2.14
Na_2O	6.41	6.71
K_2O	5.19	6.31
P_2O_5	0.39	0.18
	100.03	100.03

The feldspars in these rocks all show a normal crystallization trend. These are undersaturated syenites being nepheline normative with the main differences from Port Cygnet due to greater potash soda, and lime.

Jombo Hill, Kenya

An unusual feldspathoidal syenite associated with analkaline intrusion occurs at Jombo Hill, Kenya, and has been described by Nyambok (1980). Jombo Hill is an intrusive plug about 3 km in diameter. The intrusion consists of a core of ijolite surrounded by a feldspathoidal syenite with an inner zone of albite nepheline syenite and an outer zone of orthoclase nepheline syenite grading outwards with decreasing nepheline content. Nyambok interpreted the formation of the feldspathoidal syenite as due to fenitization of the country rock about the ijolite core with preferential sodium metasomatism at higher temperatures and potassium at lower temperatures.

Analyses of Jombo Hill Syenites

	Albite nepheline syenite	Orthoclase nepheline syenite
SiO_2	54.84	56.36
TiO_2	0.26	0.50
Al_2O_3	21.21	19.28
Fe_2O_3	2.94	3.99
FeO	1.45	1.68
MnO	0.06	0.03
MgO	0.24	0.27
CaO	1.25	1.92
Na_2O	8.05	8.99
K_2O	6.07	5.16
P_2O_5	0.03	0.09
H_2O^+	2.79	1.69
Total	99.19	99.96

Mt. Dromedary, New South Wales

The complex most nearly resembling the Port Cygnet rocks in eastern Australia occurs at Mt. Dromedary in southeastern New South Wales near the coastal town of Narooma. This is middle Cretaceous with the same age as the Port Cygnet rocks (Evernden and Richards, 1962). The definitive studies so far concerning this complex have been by Brown (1930) and Boesen (1964) with the essential findings of both summarized in Joplin (1964). Brown recognized both saturated and undersaturated rock types at Mt. Dromedary and considered the complex a differentiated sequence.

Boesen has shown that there are apparently three stock-like intrusions comprising the main body of the complex with a sequence commencing with pyroxenite stock and subsequently followed by a monzonite and then a banatite stock. The trend for these rocks has been plotted in Fig. AI-3 where it parallels a similar trend which can be followed from the Port Cygnet syenites through to the amphibolite and the amphibole. This ends on the pyroxenite which grows into a gabbro, that is, where there is a calcic plagioclase present. Lamprophyric dykes are also associated with the complex and Boesen has also recorded a dyke similar to the Port Cygnet rocks with a trachytic texture, zoned phenocrysts of plagioclase (An_{12}-An_{50}) and having brown melanite and green aegirine in a groundmass of potash feldspar and fine grains of augite. Some undersaturated rocks occur at Little Dromedary with the appearance of nepheline. Boesen considered some of these could be hybrids formed by alkali reaction with the earlier pyroxenite. The A.F.M. plot trend suggests that Mt. Dromedary and Port Cygnet have had a similar evolution.

Other Mineral Localities in New South Wales

Mount Canoblas near Dubbo has trachyte associated with basaltic rocks. Also near Dubbo there is a soda syenite recorded at Bushrangers Hill. A boss of syenite near Cooma contains hornblende which is not typical of syenite. It was thought this syenite might be related to the Cooma granite (Browne, 1914).

A laccolith of microsyenite occurs at Mt. Gibraltar near Bowral. Some pegmatitic phases occur in this rock. The age has been determined at 178 Ma by Evernden and Richards (1962).

SUMMARY

From the preceding discussion it is apparent, particularly for smaller complexes, that there is usually an association of the syenite type rocks with sialic or mafic rocks. Since there is little likelihood of granitic rocks in the Cygnet district (Leaman et al., 1980), then a parental mafic association could be anticipated for the Port Cygnet rocks. The A.F.M. plots of Figs. AI-3 shows the similarity of trends for the Port Cygnet syenite porphyries, Mt. Dromedary, Glen Dessary and Phalaborwa if the amphibolite inclusions from the Cygnet rocks are included on the plot.

For the total alkali plot (Fig. AI-4) the Port Cygnet rocks do not show the clear trends of the comparative areas plotted, but tend to occur as two groups. These may be compared with the Finmark and East Ontario rocks of Appleyard (1974) (Figs. AI-5 and AI-6) to which the potassium-rich rocks from Port Cygnet have been added for comparison.

In the total alkali diagram (Fig. AI-5) the Cygnet rocks are closer to the Finmark example than to those of Eastern Ontario by

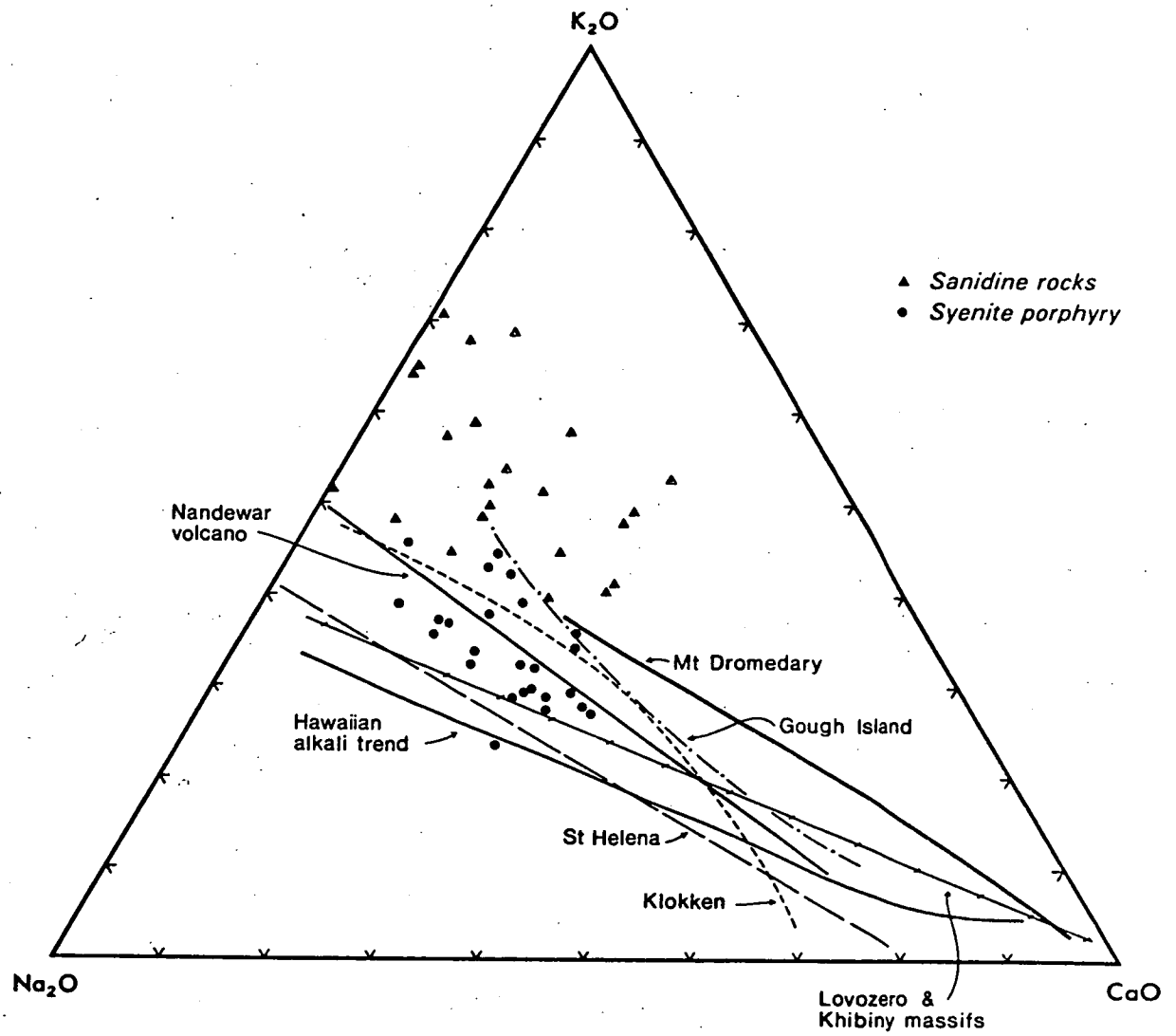


Figure AI-4 Total alkali plot for all rocks with trends for other areas added.

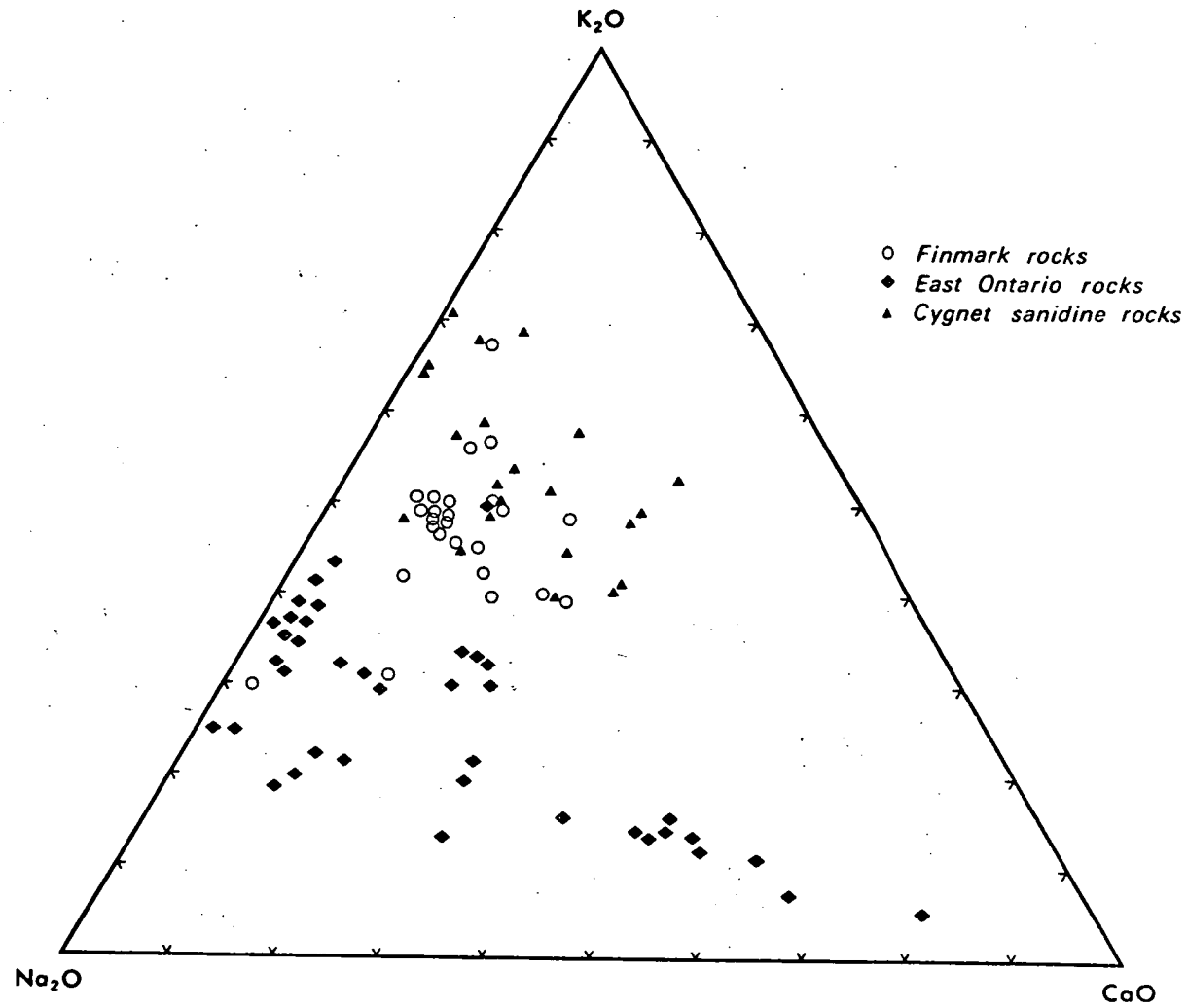


Figure AI-5 Total alkali plot comparing the Port Cygnet potassium-rich rocks with those of Finmark and eastern Ontario (after Appleyard, 1974).

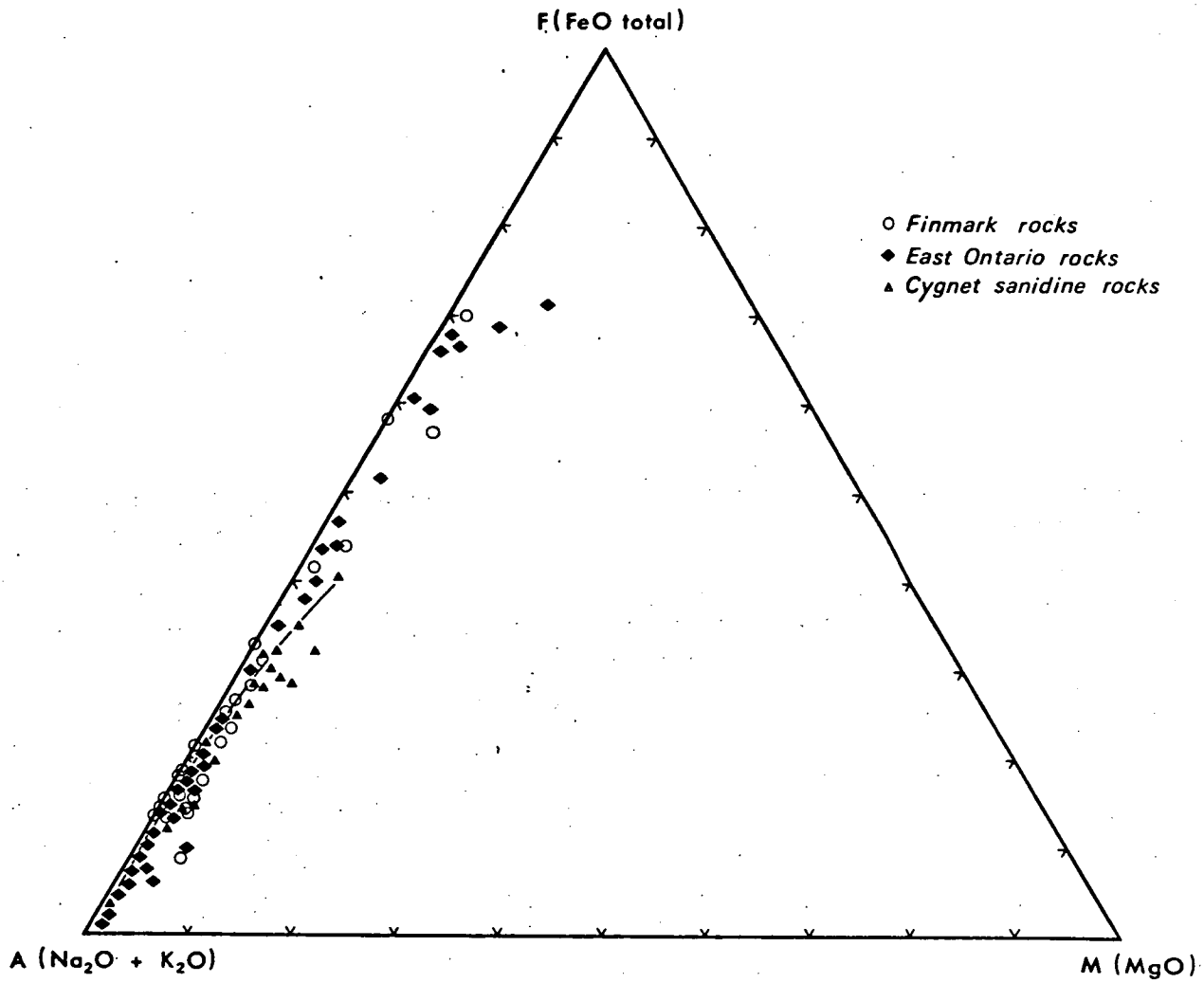


Figure AI-6 AFM plot comparing the Port Cygnet potassium-rich rocks with those of Finmark and eastern Ontario (after Appleyard, 1974).

virtue of their greater potash content.

For the A.F.M. plot (Fig. AI-6) there is a greater range in FeO due to the diversity of rock types present at Finmark and East Ontario.

The requirement of more than one source for alkaline rocks in a complex for some of the examples discussed above may be noted, as well as the tendency for separate trends for the sanidine porphyries and syenite porphyries on the A.F.M. plot for the Port Cygnet alkaline rocks.

Appendix 2

X-RAY FLUORESCENCE ANALYTICAL DATA

Most analytical data, unless specifically stated, were obtained using the technique of X-ray fluorescent spectrometry. The instrument used was a Philips PW1410 manual spectrometer equipped with both gas flow proportional and scintillation detectors connected to a counting unit via a single channel automatic discriminator. P_{10} gas (10% methane in argon) was used as the gas flow counter gas for all determinations. A choice of analysing crystals was available from the following: LiF_{220}, LiF_{200}, Penta-erithrytol$_{001}$ (P.E.), Ge_{111} and Thallium hydrogen phthallate (TlHP). The use of the TlHP crystal enabled the determination of sodium, as a major element, with sufficient precision.

The major elements were determined using the method of Norrish & Hutton (1969). Because sodium was being analysed on the fused lithium borate-lanthanum oxide discs the sodium nitrate oxidizing agent, recommended by the above authors was replaced by lithium nitrate. Total iron was reported as Fe_2O_3 by this method. FeO was determined independently by the colorimetric method of Shapiro & Brannock (1962). This technique was chosen because of the presence of small amounts of sulphide in some of the rocks which could have otherwise interfered with the FeO determinations.

Trace element data were collected by measuring the net intensities of the elements on compressed powders produced by fine grinding in a Siebtechnik swing mill containing a tungsten carbide vessel, and subsequently compressed at 12500 lbs/sq.inch in a press and having a boric acid backing added to stabilise the specimen. Since the major element concentrations were known for the specimens a mass absorption correction was calculated to correct the net intensities when measured against trace

Table A2.1

INSTRUMENT SETTINGS FOR TRACE ELEMENTS

Element	Tube	KV	mA	Coll.	Vacuum	Counter**	Crystal	Angle	Background	Counting Time*
Scandium ($K\alpha_1$)	Cr	50	50	coarse	yes	gfpc	LiF_{200}	97.67°	96°	20,20
Chromium ($K\alpha_1$)	Au	50	50	fine	yes	gfpc	LiF_{200}	69.34°	±1°	50,50,50
Nickel ($K\alpha_1$)	Au	50	30	fine	no	gfpc+scint	LiF_{200}	48.65°	49.65°	50,50
Copper ($K\alpha_1$)	Au	50	40	fine	no	gfpc+scint	LiF_{200}	45°	44.0,46.5°	20,20,20
Zinc ($K\alpha_1$)	Au	50	30	fine	no	gfpc+scint	LiF_{200}	41.81°	41.11,43.21°	20,20,20
Rubidium ($K\alpha_1$)	Mo	50	30	fine	no	scint	LiF_{220}	38.00°	±0.6°	20,20,20
Strontium ($K\alpha_1$)	Au	60	40	fine	no	scint	LiF_{220}	35.87°	±0.7°	20,20,20
Zirconium ($K\alpha_1$)	Au	60	40	fine	no	scint	LiF_{220}	32.12°	±1.0°	20,20,20
Yttrium ($K\alpha_1$)	Mo	50	30	fine	no	scint	LiF_{220}	33.93°	±1.0°	20,20,20
Niobium ($K\alpha_1$)	Au	60	40	fine	no	scint	LiF_{220}	30.45°	±0.5°	100,100,100
Barium ($K\alpha_1$)	Cr	50	50	fine	yes	gfpc	LiF_{200}	87.14°	±2.5°	100,100,100
Lead ($K\beta_1$)	Mo	60	40	fine	no	scint	LiF_{220}	40.34°	±0.8°	50,50
Cesium ($L\alpha_1$)	Cr	50	50	fine	yes	gfpc	LiF_{200}	91.85°	±0.85°	100,100
Germanium ($K\alpha_1$)	Mo	50	40	fine	yes	gfpc+scint	LiF_{200}	38.87°	-0.5,+1.0°	20,40,20

* seconds

** scint = scintillation counter, gfpc = gas flow proportional counter

element standards which were prepared by incorporating appropriate quantities of the elements in silica or kaolin matrices.

The instrumental settings used for the trace element determinations are presented in Table A2.1.

Cygnet Samples

25/11/85 R.R. RJF

	CYX44	CY 44	CY 49	CY74	CY91	CY130		
SiO_2	59.71	55.49	65.15	53.86	55.12	63.16		
TiO_2	0.29	0.43	0.30	0.54	0.78	0.38		
Al_2O_3	18.02	19.28	17.90	17.77	17.06	18.20		
Fe_2O_3	3.36	4.81	2.13	5.29	8.03	3.15		
MnO	0.17	0.35	0.07	0.22	0.21	0.10		
MgO	0.15	0.41	0.66	0.48	1.74	0.55		
CaO	1.54	4.50	3.68	4.63	5.14	4.52		
Na_2O	7.42	3.45	4.99	6.07	3.39	5.33		
K_2O	7.78	7.24	4.31	7.10	6.60	3.87		
P_2O_5	0.03	0.07	0.11	0.09	0.48	0.12		
LOSS	0.96	3.16	0.73	3.68"	1.07	0.65		
TOTAL	99.43	99.19	100.03	99.73	99.62	100.03		
Sulphur	0.13	1.05	0.04	0.15	0.09	0.11		

LOSS is loss at 1000°C overnight (including sulphur)

(1)

APPENDIX 2 - ANALYSED SPECIMENS

Specimen no. 60146
Analysis no. CY5D0L

	Oxide %	Element %	Nominal %
Fe_2O_3	1.13	7.87	11.19
FeO	9.12		
MnO	0.20	0.15	0.20
TiO_2	0.64	0.38	0.64
CaO	9.87	7.05	10.03
K_2O	1.04	0.87	1.05
P_2O_5	0.10	0.04	0.10
SiO_2	54.32	25.39	53.94
Al_2O_3	14.76	7.81	14.60
MgO	4.86	2.93	4.82
Na_2O	0.55	0.41	0.55
Loss	1.81	0.00	0.79
TOTAL	98.38		

ZrKα	39	RbKα	2	ppm
SrKα	121	BaLα	222	

K_2O/MgO= 0.917; FeO/Fe_2O_3=4.262; CaO/Na_2O=19.833; K_2O/Na_2O=1.244; Sr/Ba=0.55; K/Ba=38.9;Ba/Rb=111

Specimen no. 60147
Analysis no. CY5-1

	Oxide %	Element %	Nominal %
Fe_2O_3	3.13	4.12	5.91
FeO	2.48		
MnO	0.22	0.17	0.23
TiO_2	0.59	0.35	0.59
CaO	4.87	3.48	4.86
K_2O	3.68	3.06	3.69
P_2O_5	0.31	0.14	0.31
SiO_2	59.75	27.93	59.61
Al_2O_3	16.80	8.89	16.83
MgO	1.85	1.11	1.84
Na_2O	5.01	3.72	5.01
Loss	0.98	0.00	0.70
TOTAL	99.68		

ZrKα	157	RbKα	100	ppm
SrKα	2026	ZnKα	61	
ScKα	13	BaLα	991	
GaKα	23	NbKα	11	
CsLα	0	PbLα	0	
YKα	18	CuKα	45	

K_2O/MgO=0.851; FeO/Fe_2O_3=0.727; CaO/Na_2O=1.074; K_2O/Na_2O=0.483; Sr/Rb=20.25; Sr/Ba=2.04; K/Rb=305.5; K/Ba=30.83; Al/Ga=3865; Ba/Rb=9.91; Cu/Sr=17.18; K/Sr=15.10

Specimen no. 60148
Analysis no. CY7A-1

	Oxide %	Element %	Nominal %
Fe_2O_3	1.35	1.02	1.48
FeO	0.09		
MnO	0.00	0.00	0.00
TiO_2	0.36	0.21	0.36
CaO	2.28	1.63	2.26
K_2O	4.46	3.70	4.45
P_2O_5	0.09	0.04	0.09
SiO_2	67.09	31.36	67.52
Al_2O_3	17.89	9.47	18.19
MgO	0.00	0.00	0.00
Na_2O	5.25	3.90	5.25
Loss	1.46	0.00	1.36
TOTAL	100.23		

ZrKα	166	RbKα	122	ppm
SrKα	1598	ZnKα	101	
ScKα	8	BaLα	1311	
GaKα	19	NbKα	10	
CsLα	1	PbLα	9	
YKα	36	CuKα	46	

K_2O/MgO=∞; FeO/Fe_2O_3=0.065; CaO/Na_2O=0.480; K_2O/Na_2O=0.559; Sr/Rb=13.10; Sr/Ba=1.22; K/Rb=303.5; K/Ba=28.24; Al/Ga=4984; Ba/Rb=10.75; Ca/Sr=10.20; K/Sr=23.17

Specimen no.60149
Analysis no. CY7D-1

	Oxide %	Element %	Nominal %
Fe_2O_3	2.15	1.57	2.26
FeO	0.09		
MnO	0.00	0.00	0.00
TiO_2	0.35	0.21	0.36
CaO	2.38	1.70	2.35
K_2O	5.43	4.51	5.43
P_2O_5	0.08	0.04	0.08
SiO_2	66.46	31.07	66.97
Al_2O_3	17.51	9.27	17.81
MgO	0.01	0.01	0.01
Na_2O	3.79	2.81	3.79
Loss	1.60	0.00	1.59
TOTAL	99.86		

ZrKα	159	RbKα	148	ppm
SrKα	1505	ZnKα	124	
NiKα	38	BaLα	1585	
ScKα	7.5	NbKα	10	
GaKα	21	PbLα	6	
CsLα	0	CuKα	58	
YKα	43			

K_2O/MgO=231.06; FeO/Fe_2O_3=0.042; CaO/Na_2O=0.694; K_2O/Na_2O=0.943; Sr/Rb=10.17; Sr/Ba=0.950; K/Rb=305; K/Ba=28.44; Al/Ga=4414;Ba/Rb=10.71; Ca/Sr=11.30; K/Sr=30

Specimen no. 60150
Analysis no.CY7E-1

	Oxide %	Element %	Nominal %
Fe_2O_3	2.16	1.81	2.61
FeO	0.39		
MnO	0.01	0.01	0.01
TiO_2	0.34	0.20	0.34
CaO	3.01	2.15	2.99
K_2O	4.66	3.87	4.66
P_2O_5	0.10	0.04	0.10
SiO_2	65.44	30.59	65.79
Al_2O_3	18.12	9.59	18.40
MgO	0.14	0.09	0.14
Na_2O	4.36	3.24	4.36
Loss	1.68	0.00	1.64
TOTAL	100.42		

ZrKα	139	RbKα	123	ppm
SrKα	1647	ZnKα	74	
NiKα	41	BaLα	1193	
GaKα	19	NbKα	11	
CsLα	0	PbLα	0	
YKα	65	CuKα	36	

K_2O/MgO=14.164; FeO/Fe_2O_3=0.181; CaO/Na_2O=0.763; K_2O/Na_2O=0.703; Sr/Rb=13.39; Sr/Ba=1.38; K/Rb=315; K/Ba=32.43; Al/Ga=5047; Ba/Rb=9.70; Ca/Sr=13.06; K/Sr=23.50

Specimen no. 60151
Analysis no. CY8-1

	Oxide %	Element %	Nominal %
Fe_2O_3	2.22	2.46	3.54
FeO	1.18		
MnO	0.18	0.14	0.18
TiO_2	0.43	0.26	0.43
CaO	4.49	3.21	4.47
K_2O	3.97	3.30	3.98
P_2O_5	0.09	0.04	0.09
SiO_2	62.83	29.37	62.91
Al_2O_3	17.75	9.39	17.92
MgO	0.66	0.40	0.66
Na_2O	5.11	3.79	5.11
Loss	0.87	0.00	0.74
TOTAL	99.77		

ZrKα	217	RbKα	119	ppm
SrKα	2171	ZnKα	47	
NiKα	2	BaLα	1071	
GaKα	23	NbKα	13	
CsLα	0	PbLα	0	
YKα	27	CuKα	0	

K_2O/MgO=2.560; FeO/Fe_2O_3=0.527; CaO/Na_2O=0.971; K_2O/Na_2O=0.511; Sr/Rb=18.24; Sr/Ba=2.03; K/Rb=277; K/Ba=30.77; Al/Ga=4083; Ba/Rb=9; Ca/Sr=148; K/Sr=15.20

Specimen no. 60152
Analysis no. CY10-1

	Oxide %	Element %	Nominal %
Fe_2O_3	1.80	1.41	2.05
FeO	0.19		
MnO	0.00	0.00	0.00
TiO_2	0.40	0.24	0.41
CaO	1.27	0.91	1.27
K_2O	3.84	3.18	3.83
P_2O_5	0.03	0.01	0.03
SiO_2	68.90	32.21	69.35
Al_2O_3	18.12	9.59	18.45
MgO	0.14	0.08	0.14
Na_2O	4.72	3.50	4.72
Loss	1.65	0.00	1.63
TOTAL	101.07		

ZrKα	184	RbKα	93	ppm
SrKα	1213	ZnKα	26	
NiKα	0	BaLα	1303	
ScKα	7.5	NbKα	11	
GaKα	20	PbLα	9	
CsLα	2.2	CuKα	1	
YKα	27			

K_2O/MgO=11.70; FeO/Fe_2O_3=0.108; CaO/Na_2O=0.297; K_2O/Na_2O=0.535; Sr/Rb=13.04; Sr/Ba=0.931; K/Rb=343; K/Ba=24.47; Al/Ga=4795; Ba/Rb=14.01

Specimen no. 60153
Analysis no. CY11-1

	Oxide %	Element %	Nominal %
Fe_2O_3	1.57	2.45	3.54
FeO	1.74		
MnO	0.12	0.09	0.12
TiO_2	0.37	0.22	0.38
CaO	4.11	2.93	4.14
K_2O	3.06	2.54	3.09
P_2O_5	0.10	0.05	0.10
SiO_2	63.81	29.83	64.39
Al_2O_3	16.70	8.84	16.96
MgO	0.72	0.44	0.73
Na_2O	4.20	3.12	4.20
Loss	4.73	0.00	4.54
TOTAL	101.23		

ZrKα	116	YKα	20	ppm
SrKα	932	RbKα	83	
NiKα	2	ZnKα	52	
CoKα	9	BaLα	1965	
GaKα	18	NbKα	10	
CsLα	2.8	PbLα	0	

K_2O/MgO=1.795; FeO/Fe_2O_3=1.108; CaO/Na_2O=1.082; K_2O/Na_2O=0.479; Sr/Rb=11.23; Sr/Ba=0.47; K/Rb=306; K/Ba=12.93; Al/Ga=4911; Ba/Rb=23.67; Ca/Sr=31.52; K/Sr=27.3

Specimen no. 60154
Analysis no. CY13-2

	Oxide %	Element %	Nominal %
Fe_2O_3	4.45	3.89	5.56
FeO	1.10		
MnO	0.16	0.12	0.16
TiO_2	0.66	0.40	0.66
CaO	2.42	1.73	2.37
K_2O	8.03	6.66	8.09
P_2O_5	0.16	0.07	0.16
SiO_2	56.37	26.35	56.44
Al_2O_3	17.38	9.20	17.48
MgO	0.84	0.51	0.84
Na_2O	4.49	3.33	4.49
Loss	3.03	0.00	2.91
TOTAL	98.96		

ZrKα	187	RbKα	234	ppm
SrKα	1922	ZnKα	100	
NiKα	11	BaLα	2338	
GaKα	26	NbKα	15	
CsLα	13.6	PbLα	6	
YKα	19	CuKα	26	

K_2O/MgO=4.035; FeO/Fe_2O_3=0.247; CaO/Na_2O=0.596; K_2O/Na_2O=1.177; Sr/Rb=8.21; Sr/Ba=0.822; K/Rb=285; K/Ba=28.51; Ba/Rb=9.99; Ca/Sr=9.00; K/Sr=34.70; Al/Ga=3538

Specimen no. 60155
Analysis no. CY14-1

	Oxide %	Element %	Nominal %
Fe_2O_3	0.83	0.61	0.88
FeO	0.04		
MnO	0.00	0.00	0.00
TiO_2	0.34	0.20	0.34
CaO	2.08	1.49	2.07
K_2O	4.26	3.54	4.25
P_2O_5	0.05	0.02	0.05
SiO_2	68.62	32.08	69.12
Al_2O_3	18.22	9.64	18.57
MgO	0.09	0.05	0.09
Na_2O	5.15	3.82	5.15
Loss	1.49	0.00	1.49
TOTAL	101.18		

ZrKα	292	RbKα	127	ppm
SrKα	1623	ZnKα	9	
NiKα	2	BaLα	2597	
ScKα	8	NbKα	9	
GaKα	20	PbLα	0	
CsLα	1.4	CuKα	0	
YKα	20			

K_2O/MgO=20.14; FeO/Fe_2O_3=0.048; CaO/Na_2O=0.446; K_2O/Na_2O=0.544; Sr/Rb=12.78; Sr/Ba=0.625; K/Rb=279; K/Ba=13.65; Ba/Rb=20.45; Al/Ga=4820

Specimen no. 60156
Analysis no. CY16-1

	Oxide %	Element %	Nominal %
Fe_2O_3	0.59	0.41	0.60
FeO	0.0		
MnO	0.00	0.00	0.00
TiO_2	0.37	0.22	0.38
CaO	2.26	1.61	2.25
K_2O	4.34	3.61	4.35
P_2O_5	0.01	0.00	0.01
SiO_2	66.22	30.96	66.56
Al_2O_3	19.20	10.16	19.56
MgO	0.00	0.00	0.00
Na_2O	4.49	3.33	4.49
Loss	1.30	0.00	1.30
TOTAL	98.79		

ZrKα	200	ZnKα	19	ppm
SrKα	2384	BaLα	1475	
NiKα	3	NbKα	11	
GaKα	21	PbLα	67	
CsLα	0	CuKα	10	
YKα	11	ScKα	7	
RbKα	104			

K_2O/MgO= ; FeO/Fe_2O_3=0; CaO/Na_2O=0.556; K_2O/Na_2O=0.636; Sr/Rb=22.9; Sr/Ba=1.62; K/Ba=24/43; K/Rb=346; Al/Ga=4838; Ca/Sr=6.8; K/Sr=15.11

Specimen no. 60157
Analysis no. CY18-1

	Oxide %	Element %	Nominal %
Fe_2O_3	2.95	3.68	5.30
FeO	2.31		
MnO	0.17	0.13	0.17
TiO_2	0.51	0.30	0.51
CaO	4.40	3.14	4.41
K_2O	3.24	2.69	3.25
P_2O_5	0.21	0.09	0.21
SiO_2	62.02	28.99	62.13
Al_2O_3	16.99	8.99	17.12
MgO	1.80	1.08	1.80
Na_2O	3.81	2.82	3.81
Loss	2.32	0.00	2.06
TOTAL	100.46		

ZrKα	160	RbKα	81	ppm
SrKα	1517	ZnKα	95	
NiKα	12	BaLα	1125	
ScKα	13.7	NbKα	8	
GaKα	20	PbLα	0	
CsLα	0	CuKα	0	
YKα	45			

K_2O/MgO=0.768; FeO/Fe_2O_3=0.783; CaO/Na_2O=1.276; K_2O/Na_2O=0.559; Sr/Rb=18.73; Sr/Ba=1.35; K/Rb=332; K/Ba=23.9; Al/Ga=4495; Ba/Rb=13.89; Ca/Sr=20.73; K/Sr=17.73

	Oxide %	Element %	Nominal %
Specimen no. 60158			
Analysis no. CY19-2			
Fe_2O_3	2.33	2.18	3.12
FeO	0.71		
MnO	0.15	0.11	0.15
TiO_2	0.29	0.18	0.29
CaO	3.58	2.56	3.50
K_2O	7.85	6.51	7.89
P_2O_5	0.02	0.01	0.02
SiO_2	56.72	27.45	58.89
Al_2O_3	18.85	9.97	19.08
MgO	0.13	0.08	0.13
Na_2O	4.71	3.50	4.71
Loss	2.52	0.00	2.44
TOTAL	99.86		

ZrKα	245	RbKα	213 ppm
SrKα	3091	ZnKα	85
ScKα	2.4	BaLα	2288
GaKα	23	NbKα	18
CsLα	3.6	PbLα	14
YKα	4	CuKα	0

K_2O/MgO=25.794; FeO/Fe_2O_3=0.295; CaO/Na_2O=0.840; K_2O/Na_2O=1.097; Sr/Rb=14.54; Sr/Ba=1.35; K/Rb=306; K/Ba=28.48; Al/Ga=4335; Ba/Rb=10.74; Ca/Sr=8.3; K/Sr=21.2

	Oxide %	Element %	Nominal %
Specimen no. 60159			
Analysis no. CY21-1			
Fe_2O_3	2.03	2.81	4.04
FeO	1.79		
MnO	0.07	0.05	0.07
TiO_2	0.57	0.34	0.57
CaO	3.68	2.63	3.63
K_2O	5.23	4.34	5.23
P_2O_5	0.16	0.07	0.16
SiO_2	66.49	31.08	67.00
Al_2O_3	13.85	7.33	13.96
MgO	2.34	1.41	2.35
Na_2O	3.78	2.80	3.78
Loss	0.98	0.00	0.78
TOTAL	100.96		

ZrKα	168	RbKα	241 ppm
SrKα	408	ZnKα	47
NiKα	24	BaLα	927
ScKα	13	NbKα	11
GaKα	17	PbLα	0
CsLα	6.46	CuKα	16
YKα	38		

K_2O/MgO=0.953; FeO/Fe_2O_3=0.881; CaO/Na_2O=1.076; K_2O/Na_2O=0.910; Sr/Rb=1.69; Sr/Ba=0.44; K/Rb=180; K/Ba=46.84; Ba/Rb=3.85; Ca/Sr=64.5; K/Sr=106

	Oxide %	Element %	Nominal %
Specimen no. 60160			
Analysis no. CY22wR			
Fe_2O_3	2.74	3.25	4.63
FeO	1.67		
MnO	0.09	0.07	0.09
TiO_2	0.74	0.44	0.72
CaO	4.54	3.24	4.41
K_2O	7.87	6.54	7.89
P_2O_5	0.19	0.08	0.19
SiO_2	61.42	28.71	61.77
Al_2O_3	14.06	7.44	14.13
MgO	2.61	1.57	2.61
Na_2O	2.95	2.19	2.95
Loss	0.83	0.00	0.64
TOTAL	99.75		

ZrKα	366	BaLα	1015 ppm
SrKα	646		

K_2O/MgO=1.285; FeO/Fe_2O_3=0.599; CaO/Na_2O=1.700; K_2O/Na_2O=1.755; Sr/Ba=0.64; K/Ba=64.4; Ca/Sr=48; K/Sr=101.1

	Oxide %	Element %	Nominal %
Specimen no. 60161			
Analysis no. CY23-1			
Fe_2O_3	2.47	3.31	4.72
FeO	2.03		
MnO	0.08	0.06	0.08
TiO_2	0.65	0.39	0.65
CaO	2.64	1.89	2.57
K_2O	8.18	6.79	8.19
P_2O_5	0.19	0.08	0.19
SiO_2	60.02	28.06	60.09
Al_2O_3	17.49	9.26	17.62
MgO	0.66	0.40	0.66
Na_2O	3.30	2.45	3.30
Loss	0.65	0.00	0.42
TOTAL	98.36		

ZrKα	230	RbKα	250 ppm
SrKα	2900	ZnKα	53
NiKα	7	BaLα	2333
ScKα	5	NbKα	12
GaKα	21	PbLα	0
CsLα	0.7	CuKα	41
YKα	19		

K_2O/MgO=5.274; FeO/Fe_2O_3=0.822; CaO/Na_2O=0.884; K_2O/Na_2O=1.631; Sr/Rb=11.5; Sr/Ba=1.24; K/Rb=272; K/Ba=29.11; Al/Ga=4409; Ba/Rb=9.33; Ca/Sr=6.5; K/Sr=23.42

	Oxide %	Element %	Nominal %
Specimen no. 60162			
Analysis no. CY25-1			
Fe_2O_3	2.44	3.30	4.74
FeO	2.04		
MnO	0.17	0.14	0.18
TiO_2	0.49	0.29	0.49
CaO	4.31	3.08	4.31
K_2O	4.08	3.39	4.10
P_2O_5	0.23	0.10	0.24
SiO_2	60.58	28.32	60.72
Al_2O_3	16.45	8.70	16.56
MgO	1.68	1.02	1.69
Na_2O	4.54	3.37	4.54
Loss	2.51	0.00	2.28
TOTAL	99.52		

ZrKα	14	ZnKα	70 ppm
SrKα	1504	BaLα	1122
ScKα	11.5	NbKα	10
GaKα	20	PbLα	0
CsLα	0.2	CuKα	39
RbKα	138	YKα	17

K_2O/MgO=1.033; FeO/Fe_2O_3=0.764; CaO/Na_2O=1.049; K_2O/Na_2O=0.591; Sr/Rb=10.90; Sr/Ba=1.34; K/Rb=24.5; K/Ba=30.19; Al/Ga=4350; Ba/Rb=8.13; Ca/Sr=20.5; K/Sr=22.50

	Oxide %	Element %	Nominal %
Specimen no. 60163			
Analysis no. CY26-1			
Fe_2O_3	2.14	1.64	2.35
FeO	0.18		
MnO	0.08	0.06	0.08
TiO_2	0.21	0.13	0.21
CaO	1.66	1.19	1.62
K_2O	7.14	5.93	7.14
P_2O_5	0.00	0.00	0.00
SiO_2	62.95	29.43	63.07
Al_2O_3	18.43	9.75	18.64
MgO	0.01	0.01	0.01
Na_2O	5.13	3.81	5.13
Loss	0.31	0.00	0.29
TOTAL	98.25		

ZrKα	270	RbKα	88 ppm
SrKα	3622	ZnKα	66
NiKα	2	BaLα	2298
ScKα	3.4	NbKα	16
GaKα	21	PbLα	12
CsLα	0	CuKα	121
YKα	12		

K_2O/MgO=303.83; FeO/Fe_2O_3=0.084; CaO/Na_2O=0.358; K_2O/Na_2O=0.916; Sr/Rb=416; Sr/Ba=1.58; K/Rb=674; K/Ba=25.79; Al/Ga=4643; Ba/Rb=26.11; Ca/Sr=3.28; K/Sr=16.36

	Oxide %	Element %	Nominal %
Specimen no. 60164			
Analysis no. CY27-1			
Fe_2O_3	2.52	1.87	2.67
FeO	0.14		
MnO	0.05	0.04	0.05
TiO_2	0.23	0.14	0.23
CaO	0.11	0.08	0.11
K_2O	10.94	9.09	10.94
P_2O_5	0.00	0.00	0.00
SiO_2	62.15	29.06	62.47
Al_2O_3	18.25	9.66	18.50
MgO	0.13	0.08	0.13
Na_2O	2.21	1.64	2.21
Loss	0.67	0.00	0.65
TOTAL	97.41		

ZrKα	143	RbKα	203 ppm
SrKα	3576	ZnKα	157
ScKα	3	BaLα	3336
GaKα	23	NbKα	11
CsLα	0	PbLα	29
YKα	8	CuKα	25

K_2O/MgO=35.81; CaO/Na_2O=0.055; K_2O/Na_2O=3.257; FeO/Fe_2O_3=0.056; Sr/Rb=17.62; Sr/Ba=1.072; K/Rb=447; K/Ba=27.22; Al/Ga=4200; Ba/Rb=16.43; Ca/Sr=0.22; K/Sr=25.40

	Oxide %	Element %	Nominal %
Specimen no. 60165			
Analysis no. CY28-1			
Fe_2O_3	1.27	1.23	1.76
FeO	0.44		
MnO	0.01	0.00	0.01
TiO_2	0.13	0.08	0.13
CaO	0.53	0.38	0.51
K_2O	8.59	7.13	8.57
P_2O_5	0.00	0.00	0.00
SiO_2	67.84	31.71	68.55
Al_2O_3	15.81	8.37	16.08
MgO	0.05	0.03	0.05
Na_2O	3.14	2.33	3.14
Loss	0.56	0.00	0.51
TOTAL	98.36		

ZrKα	54	RbKα	140 ppm
SrKα	957	ZnKα	43
NiKα	2	BaLα	1208
ScKα	5	NbKα	8
GaKα	18	PbLα	2
CsLα	0	CuKα	45
YKα	7		

K_2O/MgO=73.191; FeO/Fe_2O_3=0.346; CaO/Na_2O=0.187; K_2O/Na_2O=1.800; Sr/Rb=6.83; Sr/Ba=0.79; K/Rb=509; K/Ba=59.03; Al/Ga=4650; Ba/Rb=8.63; Ca/Sr=3.96; K/Sr=74.5

	Oxide %	Element %	Nominal %
Specimen no. 60166			
Analysis no. CY29-3			
Fe_2O_3	4.61	4.70	6.66
FeO	1.90		
MnO	0.18	0.14	0.17
TiO_2	1.01	0.60	0.98
CaO	5.41	3.86	5.25
K_2O	8.75	7.26	8.81
P_2O_5	0.20	0.09	0.20
SiO_2	53.19	24.86	53.04
Al_2O_3	18.21	9.64	18.25
MgO	0.95	0.57	0.95
Na_2O	3.32	2.46	3.32
Loss	1.59	0.00	1.38
TOTAL	99.30		

ZrKα	86	RbKα	191 ppm
SrKα	2552	ZnKα	60
ScKα	3	BaLα	3863
GaKα	24	NbKα	12
CsLα	1.4	PbLα	0
YKα	10	CuKα	61

K_2O/MgO=3.919; FeO/Fe_2O_3=0.412; K_2O/Na_2O=1.734; Sr/Rb=13.36; Sr/Ba=0.661; K/Rb=380; K/Ba=18.80; Al/Ga=4017; Ba/Rb=20.23; Ca/Sr=15.15; K/Sr=28.5

	Oxide %	Element %	Nominal %
Specimen no. 60167			
Analysis no. CY30-1			
Fe_2O_3	1.90	1.41	2.03
FeO	0.11		
MnO	0.30	0.23	0.30
TiO_2	0.14	0.09	0.14
CaO	1.31	0.94	1.27
K_2O	7.61	6.32	7.59
P_2O_5	0.00	0.00	0.00
SiO_2	67.72	31.66	68.35
Al_2O_3	15.70	8.31	15.94
MgO	0.18	0.11	0.18
Na_2O	3.84	2.84	3.83
Loss	0.44	0.00	0.44
TOTAL	99.25		

ZrKα	157	ZnKα	69 ppm
SrKα	902	BaLα	856
NiKα	2	NbKα	7
ScKα	3	PbLα	0
GaKα	19	CuKα	29
YKα	10		
RbKα	127		

K_2O/MgO=17.991; FeO/Fe_2O_3=0.058; CaO/Na_2O=0.378; K_2O/Na_2O=1.307; Sr/Rb=7.10; Sr/Ba=1.05; K/Rb=497; K/Ba=73.8; Al/Ga=4374; K/Sr=70; Ba/Rb=6.74; Ca/Sr=10.40

	Oxide %	Element %	Nominal %
Specimen no. 60168			
Analysis no. CY31-1			
Fe_2O_3	1.41	1.11	1.57
FeO	0.16		
MnO	0.06	0.04	0.06
TiO_2	0.31	0.19	0.31
CaO	1.36	0.97	1.29
K_2O	11.26	9.35	11.26
P_2O_5	0.04	0.02	0.04
SiO_2	63.57	29.72	64.07
Al_2O_3	17.47	9.25	17.75
MgO	0.33	0.20	0.33
Na_2O	2.15	1.60	2.15
Loss	0.38	0.00	0.36
TOTAL	98.49		

ZrKα	104	RbKα	305 ppm
SrKα	1293	MoKα	0.87
NiKα	2	ZnKα	37
ScKα	3	BaLα	1106
GaKα	25	NbKα	8
CsLα	1.8	PbLα	1
YKα	0	CuKα	140

K_2O/MgO=14.52; FeO/Fe_2O_3=0.111; CaO/Na_2O=0.699; K_2O/Na_2O=3.446; Sr/Ba=4.24; Sr/Ba=1.17; K/Rb=306; K/Ba=84.51; Al/Ga=3700; K/Sr=72.30; Ba/Rb=3.63; Ca/Sr=7.52

	Oxide %	Element %	Nominal %
Specimen no. 60169			
Analysis no. CY32-1			
Fe_2O_3	3.09	2.31	3.31
FeO	0.20		
MnO	0.03	0.02	0.03
TiO_2	0.25	0.15	0.25
CaO	0.43	0.31	0.42
K_2O	9.23	7.66	9.23
P_2O_5	0.00	0.00	0.00
SiO_2	62.39	29.17	62.61
Al_2O_3	17.88	9.46	18.09
MgO	0.01	0.00	0.01
Na_2O	3.42	2.54	3.42
Loss	0.55	0.00	0.53
TOTAL	97.48		

ZrKα	228	RbKα	133
SrKα	4801	ZnKα	76
NiKα	3	BaLα	3107
ScKα	3	NbKα	8
GaKα	27	PbLα	15
CsLα	0	CuKα	47
YKα	34		

K_2O/MgO=393.2; FeO/Fe_2O_3=0.065; CaO/Na_2O=0.139; K_2O/Na_2O=1.776; Sr/Rb=36.10; Sr/Ba=1.55; K/Rb=576; K/Ba=24.66; Al/Ga=3504; K/Sr=16; Ba/Rb=23.36; Ca/Sr=0.64

APPENDIX 2 - ANALYSED SPECIMENS cont.

Specimen no. 60170
Analysis no. CY33B

	Oxide %	Element %	Nominal %
Fe_2O_3	5.72	5.39	7.64
FeO	1.79		
MnO	0.12	0.09	0.12
TiO_2	1.23	0.74	1.21
CaO	6.41	4.58	6.27
K_2O	7.00	5.81	7.05
P_2O_5	0.48	0.21	0.49
SiO_2	55.30	25.85	55.29
Al_2O_3	15.26	8.07	15.24
MgO	2.27	1.37	2.26
Na_2O	2.31	1.71	2.31
Loss	1.11	0.00	0.92
TOTAL	99.02		

ZrKα	142	RbKα	202
SrKα	2260	ZnKα	78
NiKα	6	BaLα	2465
ScKα	12.5	NbKα	19
GaKα	21	PbLα	0
CsLα	0	CuKα	0
YKα	30		

K_2O/MgO=1.312; FeO/Fe_2O_3=0.311; CaO/Na_2O=3.067; K_2O/Na_2O=1.994; Al/Ga=3843; Ba/Rb=12.20; Ca/Sr=20.27; K/Sr=25.71

Specimen no. 60171
Analysis no. CY34

	Oxide %	Element %	Nominal %
Fe_2O_3	4.52	5.28	7.50
FeO	2.76		
MnO	0.22	0.17	0.22
TiO_2	0.96	0.57	0.93
CaO	5.89	4.21	5.73
K_2O	8.15	6.76	8.19
P_2O_5	0.31	0.14	0.31
SiO_2	53.31	24.92	53.08
Al_2O_3	17.93	9.49	17.92
MgO	1.40	0.84	1.39
Na_2O	4.14	3.07	4.14
Loss	1.46	0.00	1.15
TOTAL	101.01		

ZrKα	101	ZnKα	84 ppm
SrKα	3164	BaLα	2906
NiKα	6	NbKα	13
GaKα	24	PbLα	0
ScKα	7	CuKα	81
YKα	21	CsLα	5
RbKα	216		

K_2O/MgO=2.480; FeO/Fe_2O_3=0.611; CaO/Na_2O=1.575; K_2O/Na_2O=1.297; Sr/Rb=14.65; Sr/Ba=1.07; K/Rb=313; K/Ba=22.81; Al/Ga=3954; Ba/Rb=13.45; Ca/Sr=13.3; K/Sr=21.41

Specimen no. 60172
Analysis no. CY35-1

	Oxide %	Element %	Nominal %
Fe_2O_3	2.39	2.31	3.28
FeO	0.82		
MnO	0.07	0.05	0.07
TiO_2	0.39	0.24	0.38
CaO	2.21	1.58	2.11
K_2O	10.73	8.90	10.74
P_2O_5	0.08	0.03	0.08
SiO_2	62.00	28.99	62.45
Al_2O_3	16.29	8.62	16.48
MgO	0.67	0.41	0.68
Na_2O	1.71	1.27	1.71
Loss	0.49	0.00	0.40
TOTAL	97.86		

ZrKα	145	RbKα	241 ppm
SrKα	2818	ZnKα	42
NiKα	6	BaLα	2172
GaKα	24	NbKα	12
CsLα	2.36	PbLα	0
YKα	11	CuKα	194

K_2O/MgO=6.815; FeO/Fe_2O_3=0.343; CaO/Na_2O=1.428; K_2O/Na_2O=4.128; Sr/Rb=11.69; Sr/Ba=1.30; K/Rb=370; K/Ba=41; Al/Ga=3592; Ba/Rb=9.01; Ca/Sr=5.6; K/Sr=31.61

Specimen no. 60173
Analysis no. CY36-3

	Oxide %	Element %	Nominal %
Fe_2O_3	4.90	7.38	10.39
FeO	5.10		
MnO	0.23	0.18	0.22
TiO_2	1.07	0.64	1.04
CaO	10.32	7.37	10.18
K_2O	5.79	4.81	5.85
P_2O_5	1.16	0.51	1.18
SiO_2	51.16	23.92	51.08
Al_2O_3	12.11	6.41	11.97
MgO	5.39	3.25	5.35
Na_2O	0.39	0.29	0.39
Loss	1.52	0.00	0.95
TOTAL	99.13		

ZrKα	94	YKα	31 ppm
SrKα	1746	RbKα	165
NiKα	19	ZnKα	134
ScKα	22	BaLα	1221
GaKα	18	NbKα	5
CsLα	1.46	PbLα	0
		CuKα	141

K_2O/MgO=0.457; CaO/Na_2O=29.245; K_2O/Na_2O=9.768; Sr/Rb=10.58; Sr/Ba=1.43; K/Rb=291; K/Ba=39.37; Ba/Rb=7.4; Ca/Sr=42.2; K/Sr=27.5

Specimen no. 60174
Analysis no. CY40-1

	Oxide %	Element %	Nominal %
Fe_2O_3	3.65	5.66	8.03
FeO	3.99		
MnO	0.15	0.12	0.15
TiO_2	0.94	0.57	0.93
CaO	3.11	2.22	3.00
K_2O	9.16	7.61	9.20
P_2O_5	0.22	0.10	0.22
SiO_2	56.43	26.38	56.41
Al_2O_3	17.38	9.20	17.43
MgO	0.86	0.52	0.86
Na_2O	1.20	0.89	1.20
Loss	1.63	0.00	1.19
TOTAL	98.72		

ZrKα	192	RbKα	287 ppm
SrKα	2273	ZnKα	106
NiKα	6	BaLα	3190
ScKα	7	NbKα	20
GaKα	27	PbLα	0
CsLα	1.4	CuKα	59
YKα	36		

K_2O/MgO=4.532; FeO/Fe_2O_3=1.093; CaO/Na_2O=2.864; K_2O/Na_2O=5.022; Sr/Rb=7.19; Sr/Ba=0.74; K/Rb=265; K/Ba=23.84; Al/Ga=3407; Ba/Rb=11.11; Ca/Sr=9.37; K/Sr=33.45

Specimen no. 60175
Analysis no. CY44-1

	Oxide %	Element %	Nominal %
Fe_2O_3	3.90	3.47	4.95
FeO	0.95		
MnO	0.36	0.28	0.35
TiO_2	0.46	0.27	0.45
CaO	4.64	3.32	4.53
K_2O	7.67	6.37	7.71
P_2O_5	0.05	0.02	0.05
SiO_2	56.64	26.48	56.54
Al_2O_3	21.73	11.50	21.98
MgO	0.25	0.15	0.25
Na_2O	2.48	1.84	2.48
Loss	2.60	0.00	2.49
TOTAL	101.73		

ZrKα	240	RbKα	217 ppm
SrKα	3825	ZnKα	268
NiKα	5	BaLα	2482
ScKα	3	NbKα	23
GaKα	24	PbLα	30
CsLα	20.8	CuKα	0
YKα	25		

K_2O/MgO=13.055; FeO/Fe_2O_3=0.244; CaO/Na_2O=2.068; K_2O/Na_2O=2.035; Sr/Rb=17.63; Sr/Ba=1.54; K/Rb=293; K/Ba=25.65; Al/Ga=4792; Ba/Rb=11.44; Ca/Sr=8.67; K/Sr=16.65

Specimen no. 60176
Analysis no. CY44CM-1

	Oxide %	Element %	Nominal %
Fe_2O_3	2.22	1.76	2.5
FeO	0.27		
MnO	0.04	0.03	0.04
TiO_2	0.41	0.24	0.41
CaO	2.68	1.91	2.61
K_2O	7.86	6.53	7.88
P_2O_5	0.05	0.02	0.05
SiO_2	60.12	28.10	60.19
Al_2O_3	20.87	11.04	21.18
MgO	0.01	0.00	0.01
Na_2O	3.10	2.30	3.10
Loss	1.60	0.00	1.57
TOTAL	99.20		

ZrKα	263	RbKα	228 ppm
SrKα	3987	ZnKα	25
NiKα	3	BaLα	3336
ScKα	4	NbKα	23
GaKα	26	PbLα	15
CsLα	10.8	CuKα	4
YKα	25		

K_2O/MgO=334.47; FeO/Fe_2O_3=0.122; CaO/Na_2O=0.955; K_2O/Na_2O=1.668; Sr/Rb=17.49; Sr/Ba=1.20; K/Rb=286; K/Ba=19.56; Al/Ga=4246; Ba/Rb=14.63; Ca/Sr=4.80; K/Sr=16.37

Specimen no. 61077
Analysis no. CY45-1

	Oxide %	Element %	Nominal %
Fe_2O_3	2.57	1.82	2.63
FeO	0.04		
MnO	0.04	0.03	0.04
TiO_2	0.26	0.16	0.27
CaO	0.18	0.13	0.18
K_2O	7.97	6.62	7.98
P_2O_5	0.00	0.00	0.00
SiO_2	62.46	29.20	62.63
Al_2O_3	19.86	10.51	20.17
MgO	0.00	0.00	0.00
Na_2O	4.25	3.16	4.25
Loss	2.08	0.00	2.08
TOTAL	99.72		

ZrKα	249	RbKα	256 ppm
SrKα	1787	ZnKα	146
NiKα	2	BaLα	1528
ScKα	4	NbKα	17
GaKα	26	PbLα	226
CsLα	0.7	CuKα	41
YKα	24		

K_2O/MgO=∞; FeO/Fe_2O_3=0.014; CaO/Na_2O=0.047; K_2O/Na_2O=1.234; Sr/Rb=6.98; Sr/Ba=1.17; K/Rb=258.5; K/Ba=43.3; Al/Ga=4042; Ba/Rb=5.97; Ca/Sr=0.72; K/Sr=37.03

Specimen no. 60178
Analysis no. CY45A-1

	Oxide %	Element %	Nominal %
Fe_2O_3	3.34	3.49	5.01
FeO	1.44		
MnO	0.04	0.03	0.04
TiO_2	0.57	0.34	0.58
CaO	3.91	2.79	3.88
K_2O	4.61	3.82	4.62
P_2O_5	0.13	0.06	0.13
SiO_2	59.49	27.81	59.31
Al_2O_3	18.59	9.84	18.69
MgO	0.59	0.36	0.59
Na_2O	5.62	4.17	5.62
Loss	0.86	0.00	0.70
TOTAL	99.22		

ZrKα	186	RbKα	112 ppm
SrKα	2434	ZnKα	27
NiKα	1	BaLα	1063
ScKα	8	NbKα	18
GaKα	24	PbLα	0
CsLα	0	CuKα	14

K_2O/MgO=3.325; FeO/Fe_2O_3=0.425; CaO/Na_2O=0.769; K_2O/Na_2O=0.540; Sr/Rb=21.7; Sr/Ba=2.29; K/Rb=342; K/Ba=36; Al/Ga=4100; Ba/Rb=9.49; Ca/Sr=11.48; K/Sr=15.72

Specimen no. 60179
Analysis no. CY45B-1

	Oxide %	Element %	Nominal %
Fe_2O_3	3.11	2.39	3.44
FeO	0.27		
MnO	0.00	0.00	0.00
TiO_2	0.28	0.17	0.28
CaO	2.40	1.72	2.37
K_2O	5.43	4.51	5.43
P_2O_5	0.01	0.00	0.01
SiO_2	64.26	30.04	64.49
Al_2O_3	17.71	9.37	17.93
MgO	0.27	0.16	0.27
Na_2O	4.84	3.59	4.84
Loss	1.29	0.00	1.26
TOTAL	99.87		

K_2O/MgO=8.558; FeO/Fe_2O_3=0.087; CaO/Na_2O=0.548; K_2O/Na_2O=0.738; Sr/Rb=17.16; Sr/Ba=1.92; K/Rb=334; K/Ba=37.38; Al/Ga=4685; Ba/Rb=8.93; Ca/Sr=7.41; K//Sr=19.46.

Specimen no. 60180
Analysis no. CY45C-1

	Oxide %	Element %	Nominal %
Fe_2O_3	1.76	2.05	2.95
FeO	1.05		
MnO	0.06	0.04	0.05
TiO_2	0.36	0.22	0.37
CaO	3.70	2.65	3.68
K_2O	4.02	3.34	4.02
P_2O_5	0.09	0.04	0.09
SiO_2	65.11	30.44	65.35
Al_2O_3	17.33	9.17	17.53
MgO	0.58	0.35	0.58
Na_2O	4.92	3.65	4.92
Loss	0.88	0.00	0.76
TOTAL	99.84		

K_2O/MgO=2.949; FeO/Fe_2O_3=0.597; CaO/Na_2O=0.831; K_2O/Na_2O=0.538; Sr/Rb=18.27; Sr/Ba=1.99; K/Ba=34.9; Al/Ga=4367; Ba/Rb=9.20; Ca/Sr=13.92; K/Sr=17.56; K/Rb=321.

Specimen no. 60181
Analysis no. CY46-2

	Oxide %	Element %	Nominal %
Fe_2O_3	3.98	3.26	4.66
FeO	0.60		
MnO	0.00	0.15	0.19
TiO_2	0.61	0.37	0.60
CaO	3.40	2.43	3.31
K_2O	8.50	7.06	8.55
P_2O_5	0.08	0.04	0.08
SiO_2	55.58	25.98	55.49
Al_2O_3	18.89	10.00	19.00
MgO	0.42	0.25	0.42
Na_2O	4.88	3.62	4.88
Loss	1.82	0.00	1.75
TOTAL	98.96		

K_2O/MgO=8.612; FeO/Fe_2O_3=0.151; CaO/Na_2O=0.770; K_2O/Na_2O=1.146; Sr/Rb=13.04; Sr/Ba=1.63; K/Rb=254; K/Ba=31.8; Al/Ga=3125; Ba/Rb=7.99; Ca/Sr=6.70; K/Sr=19.46.

	Oxide %	Element %	Nominal %
Specimen no. 60182			
Analysis no. CY47A-1			
Fe_2O_3	1.15	1.08	1.56
FeO	0.36		
MnO	0.01	0.01	0.02
TiO_2	0.57	0.34	0.58
CaO	1.79	1.28	1.75
K_2O	6.60	5.48	6.61
P_2O_5	0.07	0.03	0.07
SiO_2	63.79	29.82	64.10
Al_2O_3	19.60	10.37	19.95
MgO	0.18	0.11	0.18
Na_2O	4.55	3.37	4.55
Loss	2.32	0.00	2.28
TOTAL	100.97		

ZrKα	207	YKα	178 ppm
SrKα	1616	RbKα	195
NiKα	5	ZnKα	125
ScKα	10	NbKα	14
GaKα	23	PbLα	26
CsLα	1.55	BaLα	988

K_2O/MgO=15.650; FeO/Fe_2O_3=0.313; CaO/Na_2O=0.435; K_2O/Na_2O=0.954; Sr/Rb=8.29; Sr/Ba=1.64; K/Ba=55.46; Al/Ga=4509; Ba/Rb=5.07; Ca/Sr=7.92; K/Sr=33.91; K/Rb=281

	Oxide %	Element %	Nominal %
Specimen no. 68183			
Analysis no. CY47B-1			
Fe_2O_3	3.00	2.24	3.21
FeO	0.18		
MnO	0.04	0.03	0.04
TiO_2	0.58	0.35	0.58
CaO	2.71	1.93	2.68
K_2O	5.81	4.83	5.84
P_2O_5	0.19	0.08	0.19
SiO_2	60.42	28.24	60.53
Al_2O_3	18.99	10.05	19.22
MgO	0.10	0.06	0.10
Na_2O	4.99	3.71	4.99
Loss	2.16	0.00	2.14
TOTAL	99.16		

ZrKα	211	RbKα	179 ppm
SrKα	1859	ZnKα	92
ScKα	10.5	BaLα	1206
GaKα	21	NbKα	12
CsLα	3.77	PbLα	28
YKα	398	CuKα	57

K_2O/MgO=24.809; FeO/Fe_2O_3=0.060; CaO/Na_2O=0.600; K_2O/Na_2O=0.766; Sr/Rb=10.39; Sr/Ba=1.54; K/Rb=40; Al/Ga=4786; Ba/Rb=6.74; Ca/Sr=10.42; K/Sr=25.95

	Oxide %	Element %	Nominal %
Specimen no. 68184			
Analysis no. CY47C-1			
Fe_2O_3	2.01	2.40	3.44
FeO	1.28		
MnO	0.19	0.15	0.19
TiO_2	0.53	0.32	0.53
CaO	3.62	2.59	3.56
K_2O	6.36	5.28	6.38
P_2O_5	0.10	0.04	0.10
SiO_2	61.14	28.58	61.29
Al_2O_3	17.83	9.44	18.01
MgO	0.58	0.35	0.58
Na_2O	4.28	3.17	4.28
Loss	1.32	0.00	1.18
TOTAL	99.24		

ZrKα	198	YKα	37 ppm
SrKα	1820	RbKα	180
NiKα	9	ZnKα	453
ScKα	7.25	NbKα	16
GaKα	22	BaLα	1107
CsLα	1.6	PbLα	54
		CuKα	0

K_2O/MgO=4674; FeO/Fe_2O_3=0.637; CaO/Na_2O=0.935; K_2O/Na_2O=0.978; Sr/Rb=10.11; Sr/Ba=1.64; K/Rb=293.3; K/Ba=47.7; Al/Ga=4291; Ba/Rb=6.15; Ga/Sr=14.21; K/Sr=29

	Oxide %	Element %	Nominal %
Specimen no. 68185			
Analysis no. CY48-1			
Fe_2O_3	1.68	1.46	2.10
FeO	0.36		
MnO	0.02	0.02	0.02
TiO_2	0.28	0.17	0.28
CaO	1.93	1.38	1.90
K_2O	5.89	4.89	5.89
P_2O_5	0.03	0.01	0.03
SiO_2	65.71	30.72	66.10
Al_2O_3	16.85	8.92	17.08
MgO	0.23	0.14	0.23
Na_2O	4.25	3.15	4.25
Loss	0.59	0.00	0.55
TOTAL	97.81		

ZrKα	183	RbKα	110 ppm
SrKα	2145	ZnKα	5
NiKα	1	BaLα	988
GaKα	22	NbKα	16
CsLα	0	PbLα	0
YKα	25	CuKα	36

K_2O/MgO=10.897; FeO/Fe_2O_3=0.214; CaO/Na_2O=0.502; K_2O/Na_2O=0.912; Sr/Rb=19.5; Sr/Ba=2.17; K/Rb=445; K/Ba=49.5; Al/Ga=4055; Ba/Rb=8.98; Ca/Sr=6.43; K/Sr=22.80

	Oxide %	Element %	Nominal %
Specimen no. 68186			
Analysis no. CY49-1			
Fe_2O_3	1.16	1.52	2.19
FeO	0.91		
MnO	0.05	0.04	0.05
TiO_2	0.28	0.17	0.29
CaO	3.64	2.60	3.61
K_2O	4.22	3.51	4.23
P_2O_5	0.05	0.02	0.05
SiO_2	65.00	30.39	65.27
Al_2O_3	17.35	9.18	17.56
MgO	0.44	0.26	0.44
Na_2O	4.69	3.48	4.69
Loss	0.61	0.00	0.51
TOTAL	98.39		

ZrKα	142	RbKα	80 ppm
SrKα	2113	BaLα	1058
ScKα	3	ZnKα	11
GaKα	20	NbKα	9
CsLα	0	PbLα	0
YKα	22	CuKα	0

K_2O/MgO=4.091; FeO/Fe_2O_3=0.784; CaO/Na_2O=0.858; K_2O/Na_2O= Sr/Rb=26.4; Sr/Ba=2.0; K/Rb=438; K/Ba=33.11; Al/Ga=4590; Ba/Rb=13.23; Ca/Sr=12.31; K/Sr=16.58

	Oxide %	Element %	Nominal %
Specimen no. 68187			
Analysis no. CY50			
Fe_2O_3	3.85	6.21	8.82
FeO	4.51		
MnO	0.18	0.14	0.18
TiO_2	0.46	0.27	0.45
CaO	11.26	8.05	11.46
K_2O	0.99	0.83	1.01
P_2O_5	0.09	0.04	0.09
SiO_2	53.78	25.14	53.49
Al_2O_3	12.80	6.77	12.63
MgO	9.16	5.52	9.14
Na_2O	0.21	0.16	0.21
Loss	1.69	0.00	1.19
TOTAL	99.00		

ZrKα	5	ZnKα	48
SrKα	135	BaLα	201
NiKα	85	NbKα	4
ScKα	48	PbLα	0
GaKα	15	CuKα	68
CsLα	0	YKα	32

K_2O/MgO=0.0464; FeO/Fe_2O_3=1.171; CaO/Na_2O=59.26; K_2O/Na_2O=3.102; Sr/Rb=1.71; Sr/Ba=0.67; K/Rb=104; K/Ba=40.9; Al/Ga=4513; Ba/Rb=2.54; Ca/Sr=596; K/Sr=60.88

	Oxide %	Element %	Nominal %
Specimen no. 68188			
Analysis no. CY52-1			
Fe_2O_3	2.68	3.40	4.89
FeO	1.96		
MnO	0.09	0.07	0.09
TiO_2	0.50	0.30	0.50
CaO	3.70	2.65	3.69
K_2O	4.17	3.46	4.18
P_2O_5	0.26	0.11	0.26
SiO_2	61.61	28.80	61.68
Al_2O_3	16.98	8.99	17.10
MgO	1.50	0.91	1.51
Na_2O	4.35	3.23	4.35
Loss	1.73	0.00	1.51
TOTAL	99.52		

ZrKα	120	BaLα	1352 ppm
SrKα	1692	NbKα	10
NiKα	9	PbLα	0
ScKα	10	CuKα	12
GaKα	26	RbKα	160
CsLα	1		

K_2O/MgO=1.178; FeO/Fe_2O_3=0.731; CaO/Na_2O=0.940; K_2O/Na_2O=0.631; Sr/Rb=10.58; Sr/Ba=1.25; K/Rb=216; K/Ba=25.60; Al/Ga=3458; Ba/Rb=8.45; Ca/Sr=15.63; K/Sr=20.5

	Oxide %	Element %	Nominal %
Specimen no.68189			
Analysis no. CY52D			
Fe_2O_3	0.32	6.50	9.25
FeO	8.11		
MnO	0.17	0.13	0.17
TiO_2	0.47	0.28	0.47
CaO	10.45	7.47	10.63
K_2O	1.20	1.00	1.22
P_2O_5	0.08	0.04	0.09
SiO_2	53.11	24.83	52.74
Al_2O_3	14.37	7.60	14.20
MgO	7.64	4.61	7.61
Na_2O	1.11	0.82	1.11
Loss	2.43	0.00	1.53
TOTAL	99.43		

ZrKα	19	YKα	23
SrKα	163	RbKα	41
NiKα	80	ZnKα	75
ScKα	36	BaLα	210
GaKα	16	NbKα	4
CsLα	1.1	PbLα	0
		CuKα	15

K_2O/MgO=0.0673; FeO/Fe_2O_3=25.34; CaO/Na_2O=10.405; K_2O/Na_2O=0.711; Sr/Rb=3.98; Sr/Ba=0.776; K/Rb=243; K/Ba=47.44; Al/Ga=4750; Ba/Rb=5.12; Ca/Sr=458; K/Sr=61

	Oxide %	Element %	Nominal %
Specimen no. 60190			
Analysis no. CY53-1			
Fe_2O_3	2.14	2.28	3.29
FeO	1.00		
MnO	0.10	0.08	0.10
TiO_2	0.38	0.23	0.38
CaO	3.79	2.71	3.79
K_2O	3.68	3.05	3.69
P_2O_5	0.10	0.04	0.10
SiO_2	64.92	30.35	65.27
Al_2O_3	16.94	8.97	17.16
MgO	0.72	0.43	0.72
Na_2O	5.59	4.15	5.59
Loss	2.36	0.00	2.25
TOTAL	101.72		

ZrKα	187	YKα	27 ppm
SrKα	1716	RbKα	92
NiKα	5	ZnKα	60
ScLα	10	BaLα	1016
GaKα	24	NbKα	11
CsLα	1.08	PbLα	0
		CuKα	0

K_2O/MgO=2.181; FeO/Fe_2O_3=0.467; CaO/Na_2O=0.749; K_2O/Na_2O=0.433; Sr/Rb=18.65; Sr/Ba=1.69; K/Rb=332; K/Ba=30.07; Al/Ga=3738; Ba/Rb=11.04; Cu/Sr=15.79; K/Sr=17.80

	Oxide %	Element %	Nominal %
Specimen no.60191			
Analysis no. CY55-1			
Fe_2O_3	1.72	2.53	3.65
FeO	1.71		
MnO	0.14	0.11	0.14
TiO_2	0.38	0.23	0.39
CaO	3.53	2.52	3.53
K_2O	3.06	2.54	3.06
P_2O_5	0.15	0.07	0.15
SiO_2	66.57	31.12	66.89
Al_2O_3	17.12	9.06	17.34
MgO	1.12	0.68	1.13
Na_2O	4.62	3.42	4.62
Loss	1.94	0.00	1.75
TOTAL	102.05		

ZrKα	156	YKα	32 ppm
SrKα	1569	RbKα	85
NiKα	3	ZnKα	67
ScKα	8	BaLα	1241
GaKα	20	NbKα	12
CsLα	0	PbLα	0
		CuKα	0

K_2O/MgO=1.166; Sr/Rb=18.46; Sr/Ba=1.26; K/Rb=239; K/Ba=20.47; Al/Ga=4530 FeO/Fe_2O =0.997; CaO/Na_2O=0.847; K_2O/Na_2O=0.437; Ba/Rb=14.6; Ca/Sr=16.13; K/Sr=16.24

	Oxide %	Element %	Nominal %
Specimen no. 60192			
Analysis no. CY56-2			
Fe_2O_3	3.20	3.56	5.09
FeO	1.72		
MnO	0.21	0.17	0.21
TiO_2	0.60	0.36	0.60
CaO	5.12	3.66	5.04
K_2O	6.49	5.39	6.54
P_2O_5	0.14	0.06	0.14
SiO_2	56.74	26.53	56.80
Al_2O_3	18.71	9.90	18.87
MgO	1.08	0.65	1.08
Na_2O	4.46	3.31	4.46
Loss	3.65	0.00	3.46
TOTAL	102.09		

ZrKα	199	YKα	41 ppm
SrKα	1512	RBKα	195
NiKα	27	ZnKα	221
ScLα	4	BaLα	1719
GaKα	23	NbKα	19
CsLα	12	PbLα	0
		CuKα	0

K_2O/MgO=2.573; FeO/Fe_2O_3=0.539; CaO/Na_2O=1.274; K_2O/Na_2O=0.963; Sr/Rb=8.06; Sr/Ba=0.91; K/Rb=278; K/Ba=31.54; Al/Ga=4326; Ba/Rb=8.82; Ca/Sr=24.30; K/Sr=35.85

	Oxide %	Element %	Nominal %
Specimen no. 60193			
Analysis no. CY57			
Fe_2O_3	1.27	6.01	8.55
FeO	6.59		
MnO	0.14	0.11	0.14
TiO_2	0.67	0.40	0.67
CaO	9.93	7.10	10.09
K_2O	1.03	0.86	1.04
P_2O_5	0.09	0.04	0.09
SiO_2	55.53	25.96	55.23
Al_2O_3	14.74	7.80	14.62
MgO	5.55	3.35	5.52
Na_2O	1.31	0.97	1.31
Loss	1.18	0.00	0.45
TOTAL	98.04		

ZrKα	66		
SrKα	112		
YKα	32		
RbKα	42		
BaLα	222		
CuKα	0		

K_2O/MgO=0.0797; FeO/Fe_2O_3=5.204; CaO/Na_2O=8.378; K_2O/Na_2O=0.517;

APPENDIX 2 - ANALYSED SPECIMENS cont.

	Oxide %	Element %	Nominal %
Specimen no. 60194			
Analysis no. CY60-1			
Fe_2O_3	2.50	3.43	4.95
FeO	2.17		
MnO	0.11	0.08	0.11
TiO_2	0.40	0.24	0.41
CaO	3.73	2.67	3.72
K_2O	3.57	2.96	3.57
P_2O_5	0.17	0.07	0.17
SiO_2	64.42	30.12	64.51
Al_2O_3	17.21	9.11	17.35
MgO	0.97	0.59	0.98
Na_2O	5.14	3.81	5.14
Loss	1.25	0.00	1.01
TOTAL	101.64		
ZrKα	222	RbKα	98 ppm
SrKα	1405	ZnKα	39
NiKα	4	BaLα	1011
ScKα	10.5	NbKα	12
GaKα	21	PbLα	0
CsLα	0	CuKα	16
YKα	35		
K_2O/MgO=1.554; FeO/Fe_2O_3=0.865; CaO/Na_2O=0.802; Sr/Rb=14.34; Sr/Ba=1.39; K/Rb=302; K/Ba=29.30; Al/Ga=4338; Ba/Rb=10.32; Ca/Sr=18.97; K/Sr=21.10			

	Oxide %	Element %	Nominal %
Specimen no. 60195			
Analysis no. CY61-1			
Fe_2O_3	1.82	1.34	1.95
FeO	0.09		
MnO	0.05	0.04	0.05
TiO_2	0.13	0.08	0.13
CaO	0.53	0.38	0.52
K_2O	6.17	5.12	6.17
P_2O_5	0.02	0.01	0.02
SiO_2	63.99	29.92	64.09
Al_2O_3	19.87	10.51	20.16
MgO	0.27	0.16	0.27
Na_2O	6.19	4.59	6.19
Loss	1.79	0.00	1.78
TOTAL	100.92		
ZrKα	396	YKα	0 ppm
SrKα	676	RbKα	260
NiKα	9	ZnKα	52
ScKα	2	BaLα	462
GaKα	30	NbKα	13
CsLα	5.86	PnLα	20
		CuKα	0
K_2O/MgO=9.756; FeO/Fe_2O_3=0.051; CaO/Na_2O=0.095; K_2O/Na_2O=0.656; Sr/Rb=2.58; Sr/Ba=1.45; K/Rb=197; K/Ba=111; Al/Ga=3503; Ba/Rb=1.78; Ca/Sr=5.65; K/Sr=76.5			

	Oxide %	Element %	Nominal %
Specimen no.60196			
Analysis no. CY62-3			
Fe_2O_3	3.83	4.57	6.53
FeO	2.48		
MnO	0.22	0.17	0.22
TiO_2	0.80	0.48	0.79
CaO	5.11	3.65	5.01
K_2O	7.94	6.59	8.04
P_2O_5	0.21	0.09	0.21
SiO_2	54.22	25.35	54.41
Al_2O_3	17.84	9.44	17.99
MgO	1.23	0.74	1.23
Na_2O	3.54	2.63	3.54
Loss	5.44	0.00	5.16
TOTAL	102.80		
ZrKα	201	RbKα	226 ppm
SrKα	2803	ZnKα	99
NiKα	3	BaLα	1942
ScKα	10	NbKα	15
GaKα	30	PbLα	10
CsLα	12	CuKα	86
YKα	102		
K_2O/MgO=2.749; Sr/Rb=12.40; Sr/Ba=1.44; K/Rb=292; K/Ba=33.9; Al/Ga=3147; Ba/Rb=8.59; Ca/Sr=13.03; K/Sr=23.52			

	Oxide %	Element %	Nominal %
Specimen no.60197			
Analysis no. CY63-1			
Fe_2O_3	1.38	0.96	1.39
FeO	0		
MnO	0.01	0.01	0.01
TiO_2	0.42	0.25	0.43
CaO	2.67	1.91	2.67
K_2O	3.63	3.01	3.62
P_2O_5	0.14	0.06	0.14
SiO_2	67.47	31.54	67.92
Al_2O_3	18.36	9.72	18.70
MgO	0.15	0.09	0.15
Na_2O	5.02	3.73	5.02
Loss	1.90	0.00	1.90
TOTAL	101.13		
ZrKα	165	RbKα	114 ppm
SrKα	1545	ZnKα	224
NiKα	25	BaLα	1217
ScKα	7.5	NbKα	12
GaKα	21	PbLα	255
CsLα	3.08	CuKα	2260
YKα	45		
K_2O/MgO=10.33; FeO/Fe_2O_3=0; CaO/Na_2O=0.588; K_2O/Na_2O=0.476; Sr/Rb=13.55; Sr/Ba=1.27; K/Rb=265; K/Ba=24.8; Al/Ga=4638; Ba/Rb=10.68; Ca/Sr=12.40; K/Sr=19.56			

	Oxide %	Element %	Nominal %
Specimen no. 60198			
Analysis no. CY64-1			
Fe_2O_3	2.78	4.04	5.79
FeO	2.70		
MnO	0.09	0.07	0.09
TiO_2	0.53	0.32	0.53
CaO	4.67	3.34	4.62
K_2O	5.06	4.20	5.06
P_2O_5	0.30	0.13	0.30
SiO_2	59.55	27.84	59.41
Al_2O_3	18.27	9.67	18.36
MgO	1.24	0.75	1.24
Na_2O	4.96	3.68	4.96
Loss	1.27	0.00	0.97
TOTAL	101.41		
ZrKα	138	YKα	29 ppm
SrKα	1648	RbKα	173
NiKα	5	ZnKα	29
ScKα	11	BaLα	1097
GaKα	23	NbKα	9
CsLα	0	PbLα	0
		CuKα	0
K_2O/MgO=1.723; FeO/Fe_2O_3=0.973; CaO/Na_2O=1.043; K_2O/Na_2O=0.671; Sr/Rb=9.5; Sr/Ba=1.50; K/Rb=292.5; K/Ba=46.13; Al/Ga=4209; Ba/Rb=6.34; Ca/Sr=20.3; K/Sr=25.5			

	Oxide %	Element %	Nominal %
Specimen no. 60199			
Analysis no. CY67-1			
Fe_2O_3	2.07	2.47	3.56
FeO	1.32		
MnO	0.04	0.03	0.04
TiO_2	0.42	0.25	0.43
CaO	3.82	2.73	3.80
K_2O	4.14	3.44	4.14
P_2O_5	0.15	0.07	0.15
SiO_2	64.91	30.55	65.18
Al_2O_3	17.45	9.23	17.66
MgO	0.73	0.44	0.73
Na_2O	4.20	3.11	4.20
Loss	1.32	0.00	1.17
TOTAL	100.57		
ZrKα	142	YKα	41 ppm
SrKα	1559	RbKα	111
NiKα	29	ZnKα	133
ScKα	7	BaLα	1173
GaKα	19	NbKα	10
CsLα	0	PbLα	0
		CuKα	23
K_2O/MgO=2.419; FeO/Fe_2O_3=0.638; CaO/Na_2O=1.005; K_2O/Na_2O=0.649; Sr/Rb=14.05; Sr/Ba=1.33; K/Rb=373; K/Ba=35.3; Al/Ga=4858; Ba/Rb=10.57; Ca/Sr=17.51; K/Sr=22.05			

	Oxide %	Element %	Nominal %
Specimen no. 60200			
Analysis no. CY69-1			
Fe_2O_3	3.42	2.74	3.99
FeO	0.47		
MnO	0.01	0.01	0.01
TiO_2	0.37	0.22	0.37
CaO	0.88	0.63	0.88
K_2O	4.16	3.45	4.15
P_2O_5	0.17	0.07	0.17
SiO_2	65.69	30.71	65.82
Al_2O_3	19.49	10.32	19.78
MgO	0.56	0.34	0.57
Na_2O	5.27	3.91	5.27
Loss	2.98	0.00	2.46
TOTAL	102.99		
ZrKα	143	RbKα	146 ppm
SrKα	1278	ZnKα	101
NiKα	9	BaLα	934
GaKα	20	NbKα	9
CsLα	0	PbLα	16
YKα	27	CuKα	0
K_2O/MgO=3.121; FeO/Fe_2O_3=0.138; CaO/Na_2O=0.185; K_2O/Na_2O=0.522; Sr/Rb=8.75; Sr/Ba=1.37; K/Ba=37.15; Al/Ga=5180; K/Rb=238; Ba/Rb=6.40; Ca/Sr=4.92; K/Sr=27.15			

	Oxide %	Element %	Nominal %
Specimen no. 60201			
Analysis no. CY70-1			
Fe_2O_3	2.14	2.64	3.82
FeO	1.48		
MnO	0.02	0.01	0.02
TiO_2	0.34	0.20	0.34
CaO	2.49	1.78	2.48
K_2O	3.71	3.08	3.71
P_2O_5	0.11	0.05	0.11
SiO_2	65.89	30.80	66.15
Al_2O_3	17.56	9.29	17.78
MgO	0.59	0.36	0.60
Na_2O	4.82	3.57	4.82
Loss	1.83	0.00	1.67
TOTAL	100.97		
ZrKα	153	YKα	58 ppm
SrKα	1755	RbKα	139
NiKα	4	ZnKα	34
ScKα	7.5	BaLα	1108
GaKα	22	NbKα	6
CsLα	0.82	PbLα	0
		CuKα	3
K_2O/MgO=2.683; FeO/Fe_2O_3=0.693; CaO/Na_2O=0.571; K_2O/Na_2O=0.506; Sr/Rb=12.63; Sr/Ba=1.58; K/Rb=322; K/Ba=27.8; Al/Ga=4222; Ba/Rb=7.97; Ca/Sr-10.14; K/Sr=17.55			

	Oxide %	Element %	Nominal %
Specimen no. 60201			
Analysis no. CY71-1			
Fe_2O_3	4.46	4.51	6.45
FeO	1.78		
MnO	0.09	0.07	0.09
TiO_2	0.62	0.37	0.62
CaO	4.38	3.13	4.33
K_2O	5.19	4.31	5.19
P_2O_5	0.37	0.16	0.37
SiO_2	58.71	27.45	58.42
Al_2O_3	18.03	9.54	18.05
MgO	1.62	0.98	0.61
Na_2O	4.85	3.60	4.85
Loss	1.44	0.00	0.00
TOTAL	100.32		
ZrKα	109	RbKα	181 ppm
SrKα	2110	ZnKα	39
NiKα	13	BaLα	1639
ScKα	15	NbKα	11
GaKα	20	PbLα	0
CsLα	1.99	CuKα	0
YKα	37		
K_2O/MgO=1.363; FeO/Fe_2O_3=0.400; CaO/Na_2O=0.998; K_2O/Na_2O=0.704; Sr/Rb=11.66; Sr/Ba=1.29; K/Rb=238; K/Ba=26.3; Al/Ga=4770; Ba/Rb=9.06; Ca/Sr=14.84; K/Sr=-20.42			

	Oxide %	Element %	Nominal %
Specimen no. 60202			
Analysis no. CY73-1			
Fe_2O_3	3.15	2.59	3.72
FeO	0.50		
MnO	0.13	0.10	0.13
TiO_2	0.33	0.20	0.33
CaO	2.75	1.96	2.68
K_2O	7.93	6.58	7.97
P_2O_5	0.05	0.02	0.05
SiO_2	57.04	26.67	56.96
Al_2O_3	19.76	10.46	19.93
MgO	0.24	0.14	0.24
Na_2O	7.08	5.25	7.08
Loss	2.60	0.00	2.54
TOTAL	101.55		
ZrKα	253	RbKα	239 ppm
SrKα	2740	ZnKα	98
NiKα	2	BaLα	1843
ScKα	3.25	NbKα	18-21
GaKα	29	PbLα	28
CsLα	6.59	CuKα	0
YKα	4		
K_2O/MgO=14.113; FeO/Fe_2O_3=0.157; CaO/Na_2O=0.429; K_2O/Na_2O=0.737; Sr/Rb=11.46; Sr/Ba=1.49; K/Rb=276; K/Ba=36; Al/Ga=3607; Ba/Rb=7.71; Ca/Sr=7.17; K/Sr=24			

	Oxide %	Element %	Nominal %
Specimen no. 60203			
Analysis no. CY74-2			
Fe_2O_3	4.35	4.01	5.74
FeO	1.27		
MnO	0.21	0.16	0.21
TiO_2	0.57	0.34	0.57
CaO	4.70	3.36	4.61
K_2O	7.36	6.11	7.42
P_2O_5	0.09	0.04	0.09
SiO_2	55.78	26.07	55.80
Al_2O_3	17.95	9.50	18.06
MgO	0.54	0.32	0.54
Na_2O	6.52	4.84	6.52
Loss	3.65	0.00	3.51
TOTAL	102.94		
ZrKα	273	RbKα	220 ppm
SrKα	3240	ZnKα	113
NiKα	3	BaLα	2086
ScKα	4.6	NbKα	24-32
GaKα	27	PbLα	0
CsLα	9.73	CuKα	2
YKα	11		
K_2O/MgO=5.831; FeO/Fe_2O_3=0.291; CaO/Na_2O=0.800; K_2O/Na_2O=0.747; Sr/Rb=14.73; Sr/Ba=1.55; K/Rb=33.64; K/Ba=29.45; Al/Ga=3519; Ba/Rb=9.48; Ca/Sr=10.41; K/Sr=18.96			

	Oxide %	Element %	Nominal %
Specimen no. 60204			
Analysis no. CY75-1			
Fe_2O_3	2.17	1.88	2.70
FeO	0.47		
MnO	0.12	0.09	0.12
TiO_2	0.50	0.30	0.50
CaO	2.97	2.12	2.92
K_2O	5.71	4.74	5.71
P_2O_5	0.17	0.07	0.17
SiO_2	62.08	29.02	62.11
Al_2O_3	19.55	10.34	19.78
MgO	0.65	0.39	0.65
Na_2O	4.99	3.70	4.99
Loss	1.23	0.00	1.18
TOTAL	100.59		
ZrKα	223	RbKα	189 ppm
SrKα	1887	ZnKα	116
NiKα	5	BaLα	1317
ScKα	9	NbKα	16
GaKα	21	PbLα	44
CsLα	0	CuKα	9
YKα	59		
K_2O/MgO=3.745; FeO/Fe_2O_3=0.215; CaO/Na_2O=0.658; K_2O/Na_2O=0.753; Sr/Rb=9.98; Sr/Ba=1.43; K/Rb=251; K/Ba=36; Al/Ga=4924; Ba/Rb=6.97; Ca/Sr=11.25; K/Sr=25.12			

	Oxide %	Element %	Nominal %
Specimen no. 60205			
Analysis no. CY76-1			
Fe_2O_3	1.63	2.67	3.82
FeO	1.96		
MnO	0.18	0.14	0.18
TiO_2	0.39	0.23	0.39
CaO	4.17	2.98	4.13
K_2O	5.13	4.26	5.15
P_2O_5	0.12	0.05	0.12
SiO_2	61.78	28.88	61.91
Al_2O_3	17.71	9.37	17.87
MgO	0.81	0.49	0.82
Na_2O	3.92	2.90	3.92
Loss	1.23	0.00	1.01
TOTAL	99.04		
ZrKα	165	RbKα	165 ppm
SrKα	1614	ZnKα	89
NiKα	1	BaLα	1440
ScKα	5.5	PbLα	24
GaKα	21	CuKα	0
CsLα	1.5	NbKα	13
YKα	29		

K_2O/MgO=2.700; FeO/Fe_2O_3=1.120; K_2O/Na_2O=0.861; Sr/Rb=9.78; K/Rb=311; K/Ba=35.63; Al/Ga=4462; Ba/Rb=8.73; Ca/Sr=18.47; K/Sr=26.4 CaO/Na_2O=1.176; Sr/Ba=1.12

	Oxide %	Element %	Nominal %
Specimen no. 60206			
Analysis no. CY78-1			
Fe_2O_3	2.74	4.60	6.64
FeO	3.49		
MnO	0.35	0.27	0.35
TiO_2	0.37	0.22	0.38
CaO	2.02	1.45	1.99
K_2O	6.66	5.53	6.69
P_2O_5	0.07	0.03	0.07
SiO_2	59.59	27.86	59.62
Al_2O_3	19.33	10.23	19.52
MgO	0.60	0.36	0.60
Na_2O	4.33	3.22	4.33
Loss	4.16	0.00	3.77
TOTAL	103.69		
ZrKα	220	RbKα	223 ppm
SrKα	1829	ZnKα	61
NiKα	7	BaLα	1353
GaKα	26	NbKα	14
CsLα	1.83	PbLα	0
YKα	20	CuKα	0

K_2O/MgO=4.752; FeO/Fe_2O_3=1.273; CaO/Na_2O=0.521; K_2O/Na_2O=1.018; Sr/Rb=8.20; Sr/Ba=1.35; K/Rb=249; K/Ba=41; Al/Ga=3958; Ba/Rb=6.07; Ca/Sr=7.97; K/Sr=30.41

	Oxide %	Element %	Nominal %
Specimen no. 60207			
Analysis no. CY79-2			
Fe_2O_3	6.70	4.78	6.89
FeO	0.16		
MnO	0.01	0.01	0.01
TiO_2	0.61	0.36	0.61
CaO	0.56	0.40	0.55
K_2O	8.58	7.12	8.61
P_2O_5	0.04	0.02	0.04
SiO_2	58.84	27.51	58.90
Al_2O_3	19.39	10.26	19.59
MgO	0.39	0.23	0.39
NaO_2	4.28	3.17	4.28
Loss	4.24	0.00	4.06
TOTAL	103.58		
ZrKα	162	RbKα	235 ppm
SrKα	3562	ZnKα	17
NiKα	5	BaLα	4808
GaKα	28	NbKα	24
CsLα	0	PbLα	0
YKα	47	CuKα	64

K_2O/MgO=9.416; FeO/Fe_2O_3=0.024; CaO/Na_2O=0.145; K_2O/Na_2O=1.327; Sr/Rb=15.16; Sr/Ba=0.74; K/Rb=305; K/Ba=14.90; Al/Ga=3686; Ba/Rb=20.46; Ca/Sr=1.12; K/Sr=20.11

	Oxide %	Element %	Nominal %
Specimen no. 60208			
Analysis no. CY80-2			
Fe_2O_3	1.73	3.71	5.31
FeO	3.21		
MnO	0.06	0.05	0.07
TiO_2	0.95	0.57	0.95
CaO	0.66	0.47	0.64
K_2O	8.73	7.25	8.73
P_2O_5	0.19	0.08	0.19
SiO_2	59.91	28.01	59.89
Al_2O_3	19.00	10.06	19.17
MgO	0.60	0.36	0.60
Na_2O	3.45	2.56	3.45
Loss	1.52	0.00	1.16
TOTAL	100.01		
ZrKα	186	YKα	46 ppm
SrKα	2012	RbKα	258
NiKα	6	ZnKα	143
ScKα	6.5	BaLα	3785
GaKα	28	NbKα	24
CsLα	9.8	PbLα	0
		CuKα	52

K_2O/MgO=6.199; FeO/Fe_2O_3=1.853; CaO/Na_2O=0.211; K_2O/Na_2O=1.665; Sr/Rb=7.8; Sr/Ba=0.532; K/Rb=338; K/Ba=23; Al/Ga=3593; Ba/Rb=14.67; Ca/Sr=2.34; K/Sr=36

	Oxide %	Element %	Nominal %
Specimen no. 60209			
Analysis no. CY81-2			
Fe_2O_3	0.37	0.33	0.48
FeO	0.10		
MnO	0.00	0.00	0.00
TiO_2	0.72	0.43	0.72
CaO	0.17	0.12	0.16
K_2O	9.66	8.02	9.63
P_2O_5	0.01	0.00	0.01
SiO_2	66.12	30.91	66.58
Al_2O_3	19.27	10.20	19.65
MgO	0.16	0.09	0.16
Na_2O	3.87	2.87	3.87
Loss	0.97	0.00	0.96
TOTAL	101.41		
ZrKα	200	RbKα	272 ppm
SrKα	1616	ZnKα	9
NiKα	0.44	BaLα	1917
ScKα	4.5	NbKα	18
GaKα	28	PbLα	0
CsLα	0	CuKα	0
YKα	17		

K_2O/MgO=25.691; FeO/Fe_2O_3=0.261; CaO/Na_2O=0.049; K_2O/Na_2O=1.642; Sr/Rb=5.94; Sr/Ba=0.8430; K/Rb=355; K/Ba=50.39; Al/Ga=3643; Ba/Rb=7.05; Ca/Sr=0.75; K/Sr=49.62

	Oxide %	Element %	Nominal %
Specimen no. 60210			
Analysis no. CY82			
Fe_2O_3	0.67	0.59	0.86
FeO	0.16		
MnO	0.01	0.01	0.01
TiO_2	0.26	0.15	0.27
CaO	0.13	0.09	0.13
K_2O	1.23	1.02	1.22
P_2O_5	0.05	0.02	0.05
SiO_2	86.07	40.24	88.71
Al_2O_3	7.33	3.88	7.52
MgO	0.47	0.29	0.48
Na_2O	2.31	1.71	2.31
Loss	1.21	0.00	1.19
TOTAL	99.90		
Zrkα	83	YKα	33 ppm
SrKα	124	RbKα	50
NiKα	3	ZnKα	12
ScKα	9	BaLα	171
GaKα	7	PbLα	5
CsLα	1.56	CuKα	7

K_2O/MgO=1.114; FeO/Fe_2O_3=0.234; CaO/Na_2O=0.062; K_2O/Na_2O=0.350; Sr/Rb=3.48; Sr/Ba=1.013; K/Rb=204; K/Ba=59.71; Al/Ga=5543; Ba/Rb=3.42; Ca/Sr=5.34; K/Sr=58.68

	Oxide %	Element %	Nominal %
Specimen no. 60211			
Analysis no. CY83-1			
Fe_2O_3	2.42	2.80	4.04
FeO	1.42		
MnO	0.12	0.10	0.12
TiO_2	0.43	0.26	0.44
CaO	4.17	2.98	4.16
K_2O	3.54	2.94	3.54
P_2O_5	0.16	0.07	0.16
SiO_2	64.41	30.11	64.75
Al_2O_3	17.12	9.06	17.34
MgO	0.31	0.18	0.31
Na_2O	5.06	3.75	5.06
Loss	2.50	0.00	2.34
TOTAL	101.66		
ZrKα	129	RbKα	102 ppm
SrKα	1491	ZnKα	42
NiKα	2	BaLα	1214
ScKα	9	NbKα	12
GaKα	20	PbLα	0
CsLα	0.86	CuKα	0
YKα	25		

K_2O/MgO=4.859; FeO/Fe_2O_3=0.586; CaO/Na_2O=0.911; K_2O/Na_2O=0.460; Sr/Rb=14.62; Sr/Ba=1.228; K/Rb=288; K/Ba=24.21; Al/Ga=4530; Ba/Rb=11.90; Ca/Sr=20; K/Sr=19.71

	Oxide %	Element %	Nominal %
Specimen no.60212			
Analysis no.CY84-2			
Fe_2O_3	3.77	4.82	6.93
FeO	2.81		
MnO	0.03	0.02	0.03
TiO_2	1.02	0.61	1.04
CaO	0.04	0.03	0.03
K_2O	7.15	5.94	7.15
P_2O_5	0.02	0.01	0.02
SiO_2	57.82	27.03	57.48
Al_2O_3	18.27	9.67	18.28
MgO	0.65	0.39	0.64
Na_2O	6.72	4.99	6.72
Loss	1.09	0.00	0.78
TOTAL	99.39		
ZrKα	161	RbKα	237 ppm
SrKα	578	ZnKα	185
ScKα	5	BaLα	2130
GaKα	29	NbKα	22
CsLα	2.98	PbLα	65
YKα	29	CuKα	0

K_2O/MgO=4.681; FeO/Fe_2O_3=0.746; CaO/Na_2O=0.007; K_2O/Na_2O=0.700; Sr/Rb=2.43; Sr/Ba=0.271; K/Rb=250; K/Ba=28; Al/Ga=3334; Ba/Rb=8.99; Ca/Sr=0.49; K/Sr=103

	Oxide %	Element %	Nominal %
Specimen no. 60213			
Analysis no. CY85A-2			
Fe_2O_3	3.75	3.20	4.57
FeO	0.74		
MnO	0.16	0.12	0.16
TiO_2	0.35	0.21	0.35
CaO	1.51	1.08	1.45
K_2O	10.31	8.56	10.32
P_2O_5	0.02	0.01	0.02
SiO_2	55.78	26.08	55.51
Al_2O_3	20.15	10.67	20.26
MgO	0.20	0.12	0.20
Na_2O	6.31	4.68	6.31
Loss	0.92	0.00	0.84
TOTAL	100.20		
ZrKα	150	RbKα	238 ppm
SrKα	4279	ZnKα	178
NiKα	1	BaLα	2825
ScKα	3	NbKα	23
GaKα	31	PbLα	30
CsLα	3.8	CuKα	0
YKα	0		

K_2O/MgO=21.936; FeO/Fe_2O_3=0.197; CaO/Na_2O=0.264; K_2O/Na_2O=1.075; Sr/Rb=17.98; Sr/Ba=1.51; K/Rb=360; K/Ba=30.30; Al/Ga=3442; Ba/Rb=11.87; Ca/Sr=2.52; K/Sr=20

	Oxide %	Element %	Nominal %
Specimen no. 60214			
Analysis no. CY85B-2			
Fe_2O_3	3.93	3.33	4.76
FeO	0.75		
MnO	0.20	0.15	0.20
TiO_2	0.41	0.25	0.41
CaO	1.82	1.30	1.75
K_2O	10.09	8.38	10.12
P_2O_5	0.04	0.02	0.04
SiO_2	54.89	25.66	54.62
Al_2O_3	19.62	10.38	19.70
MgO	0.25	0.15	0.25
Na_2O	6.01	4.46	6.01
Loss	0.73	0.00	0.65
TOTAL	98.75		
ZrKα	149	RbKα	226 ppm
SrKα	4479	ZnKα	109
NiKα	2	BaLα	3313
ScKα	3	NbKα	26
GaKα	29	PbLα	21
CsLα	3.58	CuKα	0
YKα	0		

K_2O/MgO=17.174; FeO/Fe_2O_3=0.192; CaO/Na_2O=0.335; K_2O/Na_2O=1.105; Sr/Rb=19.82; Sr/Ba=1.35; K/Rb=371; K/Ba=25; Al/Ga=3579; Ba/Rb=14.66; Ca/Sr=2.90; K/Sr=18.70

	Oxide %	Element %	Nominal %
Specimen no. 60215			
Analysis no. CY85C-2			
Fe_2O_3	4.18	3.47	4.97
FeO	0.71		
MnO	0.13	0.10	0.13
TiO_2	0.42	0.25	0.42
CaO	1.40	1.00	1.35
K_2O	9.77	8.11	9.80
P_2O_5	0.08	0.04	0.08
SiO_2	56.22	26.28	56.09
Al_2O_3	19.77	10.46	19.91
MgO	0.54	0.33	0.55
Na_2O	4.77	3.54	4.77
Loss	1.99	0.00	1.91
TOTAL	99.99		
ZrKα	164	RbKα	197 ppm
SrKα	3508	ZnKα	175
NiKα	17	BaLα	3688
ScKα	2	PbLα	29
GaKα	33	CuKα	12
CsLα	7		
YKα	0		

K_2O/MgO=18.09; FeO/Fe_2O_3=0.170; CaO/Na_2O=0.298; Sr/Rb=17.81; Sr/Ba=0.951; K/Rb=412; K/Ba=22; Al/Ga=5990; Ba/Rb=18.72; Ca/Sr=2.85; K/Sr=23.12

	Oxide %	Element %	Nominal %
Specimen no. 60216			
Analysis no. CY86-2			
Fe_2O_3	3.10	3.33	4.77
FeO	1.49		
MnO	0.05	0.04	0.05
TiO_2	0.61	0.37	0.61
CaO	0.35	0.25	0.34
K_2O	9.45	7.85	9.48
P_2O_5	0.06	0.03	0.06
SiO_2	59.03	27.60	59.14
Al_2O_3	18.75	9.92	18.94
MgO	0.40	0.24	0.40
Na_2O	3.19	2.37	3.19
Loss	2.35	0.00	2.18
TOTAL	98.83		
ZrKα	143	RbKα	280 ppm
SrKα	2597	ZnKα	76
NiKα	2	BaLα	1959
ScKα	4.5	NbKα	25
GaKα	29	PbLα	33
CsLα	9	CuKα	9
YKα	8		

K_2O/MgO=10.063; FeO/Fe_2O_3=0.480; Sr/Rb=9.28; Sr/Ba=1.33; K/Rb=280; K/Ba=40; Al/Ga=3421; Ba/Rb=7.00; Ca/Sr=0.96; K/Sr=30.21

APPENDIX 2 - ANALYSED SPECIMENS cont.

	Oxide %	Element %	Nominal %

Specimen no. 60217
Analysis no. CY87-1

Fe_2O_3	0.99	3.25	4.70
FeO	3.29		
MnO	0.54	0.42	0.55
TiO_2	0.41	0.24	0.42
CaO	2.44	1.74	2.43
K_2O	4.15	3.45	4.17
P_2O_5	0.14	0.06	0.14
SiO_2	63.74	29.80	64.02
Al_2O_3	17.03	9.01	17.22
MgO	0.79	0.47	0.79
Na_2O	4.33	3.21	4.33
Loss	3.23	0.00	2.86
TOTAL	101.07		

ZrKα	150	RbKα	160 ppm
SrKα	1183	ZnKα	177
NiKα	23	BaLα	1674
ScKα	6.3	NbKα	12
GaKα	18	PbLα	1
CsLα	2.67	CuKα	0
YKα	37		

K_2O/MgO=2.245; FeO/Fe_2O_3=3.316;
CaO/Na_2O=0.623; K_2O/Na_2O=0.631;
Sr/Rb=7.39; Sr/Ba=0.707;
K/Rb=215; K/Ba=21;
Al/Ga=5006; Ba/Rb=10.46;
Ca/Sr=14.74; K/Sr=29.12

Specimen no. 60218
Analysis no. CY88-1

Fe_2O_3	1.71	2.18	3.15
FeO	1.26		
MnO	0.02	0.01	0.02
TiO_2	0.45	0.27	0.47
CaO	1.47	1.05	1.47
K_2O	2.97	2.46	2.96
P_2O_5	0.16	0.07	0.15
SiO_2	67.21	31.42	67.51
Al_2O_3	18.28	9.67	18.56
MgO	0.52	0.31	0.52
Na_2O	4.16	3.09	4.16
Loss	1.98	0.00	1.84
TOTAL	100.18		

ZrKα	210	RbKα	92 ppm
SrKα	1532	ZnKα	46
NiKα	2	BaLα	3873
ScKα	9	NbKα	11
GaKα	19	PbLα	0
CsLα	0	CuKα	0
YKα	65		

K_2O/MgO=2.430; FeO/Fe_2O_3=0.735;
CaO/Na_2O=0.391; K_2O/Na_2O=0.470;
Sr/Rb=16.65; Sr/Ba=0.396;
K/Rb=268; K/Ba=6.37;
Al/Ga=5089; Ba/Rb=42.1;
Ca/Sr=6.86; K/Sr=16.09

Specimen no. 60219
Analysis no. CY89-1

Fe_2O_3	1.58	2.40	3.46
FeO	1.67		
MnO	0.24	0.19	0.24
TiO_2	0.37	0.22	0.37
CaO	3.29	2.35	3.29
K_2O	3.23	2.68	3.24
P_2O_5	0.14	0.06	0.14
SiO_2	65.42	30.58	65.74
Al_2O_3	16.76	8.87	16.96
MgO	0.79	0.48	0.79
Na_2O	4.37	3.24	4.37
Loss	1.85	0.00	1.66
TOTAL	99.70		

ZrKα	120	ZnKα	208 ppm
SrKα	1507	BaLα	1288
ScKα	9.6	NbKα	10
GaKα	19	PbLα	0
CsLα	0		
YKα	36		
RbKα	73		

K_2O/MgO=1.745; FeO/Fe_2O_3=1.055;
CaO/Na_2O=0.832; K_2O/Na_2O=0.486;
Sr/Rb=20.64; Sr/Ba=1.17;
K/Rb=367; K/Ba=21;
Al/Ga=4668; Ba/Rb=17.64;
Ca/Sr=30.55; K/Sr=17.79

Specimen no. 60220
Analysis no. CY90-1

Fe_2O_3	1.67	2.62	3.78
FeO	1.86		
MnO	0.12	0.09	0.12
TiO_2	0.38	0.23	0.38
CaO	4.05	2.90	4.07
K_2O	3.24	2.69	3.25
P_2O_5	0.16	0.07	0.16
SiO_2	63.39	29.64	63.66
Al_2O_3	16.54	8.75	16.71
MgO	0.96	0.58	0.97
Na_2O	6.34	4.70	6.34
Loss	2.79	0.00	2.58
TOTAL	101.49		

ZrKα	366	RbKα	85 ppm
SrKα	1566	ZnKα	60
ScKα	7	BaLα	1181
GaKα	20	NbKα	9
CsLα	7	PbLα	3
YKα	22	CuKα	0

K_2O/MgO=1.426; FeO/Fe_2O_3=1.113;
CaO/Na_2O=0.706; K_2O/Na_2O=0.336;
Sr/Rb=18.4; Sr/Ba=1.33;
K/Rb=382; K/Ba=27.5;
Al/Ga=4375; Ba/Rb=13.89;
Ca/Sr=18.48; K/Sr=17.18

Specimen no. 60221
Analysis no. CY91-1

Fe_2O_3	2.28	5.73	8.17
FeO	5.32		
MnO	0.19	0.15	0.19
TiO_2	0.80	0.48	0.79
CaO	5.15	3.68	5.05
K_2O	6.75	5.61	6.78
P_2O_5	0.49	0.21	0.49
SiO_2	55.27	25.84	55.04
Al_2O_3	16.66	8.82	16.62
MgO	2.04	1.23	2.03
Na_2O	4.47	3.32	4.47
Loss	1.50	0.00	0.91
TOTAL	100.93		

ZrKα	320	RbKα	183 ppm
SrKα	2339	ZnKα	93
ScKα	14	BaLα	1910
GaKα	18	NbKα	9
CsLα	3.70	PbLα	0
YKα	42	CuKα	10

K_2O/MgO=1.410; FeO/Fe_2O_3=2.332;
CaO/Na_2O=1.273; K_2O/Na_2O=0.994;
Sr/Rb=12.78; Sr/Ba=1.23;
K/Rb=307; K/Ba=29.38;
Al/Ga=4900; Ba/Rb=10.44

Specimen no. 60222
Analysis no. CY92-1

Fe_2O_3	1.47	1.36	1.96
FeO	0.42		
MnO	0.13	0.10	0.13
TiO_2	0.12	0.07	0.12
CaO	1.39	1.00	1.37
K_2O	6.12	5.08	6.12
P_2O_5	0.03	0.01	0.03
SiO_2	63.30	29.59	63.35
Al_2O_3	19.68	10.41	19.94
MgO	0.29	0.17	0.29
Na_2O	5.82	4.31	5.82
Loss	1.16	0.00	1.11
TOTAL	99.93		

ZrKα	483	RbKα	226 ppm
SrKα	853	ZnKα	57
ScKα	2	BaLα	2207
GaKα	28	NbKα	19
CsLα	56	PbLα	18
YKα	23	CuKα	0

K_2O/MgO=8.98; FeO/Fe_2O_3=0.287;
Sr/Rb=3.77; Sr/Ba=0.386;
K/Rb=225; K/Ba=23; Al/Ga=3718;
Ba/Rb=9.77; Ca/Sr=11.72;
K/Sr=59.56

Specimen no. 60223
Analysis no. CY94-2

Fe_2O_3	2.16	1.94	2.79
FeO	0.56		
MnO	0.13	0.10	0.13
TiO_2	0.27	0.16	0.26
CaO	3.36	2.40	3.30
K_2O	7.17	5.95	7.21
P_2O_5	0.11	0.05	0.11
SiO_2	56.41	26.37	56.21
Al_2O_3	20.42	10.81	20.59
MgO	0.50	0.30	0.50
Na_2O	6.33	4.70	6.33
Loss	1.48	0.00	1.42
TOTAL	98.91		

ZrKα	221		
SrKα	3493		
YK α	2		
BaLα	2038		

K_2O/MgO=6.102; Sr/Rb=18.38;
Sr/Ba=1.71; K/Rb=313;
K/Ba=29; Al/Ga=4158;
Ba/Rb=10.73; Ca/Sr=6.87;
K/Sr=17.04

Specimen no. 60223
Analysis no. CY94

Fe_2O_3	2.05	1.86	2.67
FeO	0.56		
MnO	0.13	0.10	0.13
TiO_2	0.27	0.16	0.27
CaO	3.45	2.46	3.38
K_2O	7.39	6.14	7.45
P_2O_5	0.09	0.04	0.09
SiO	55.40	25.90	55.23
Al_2O_3	20.05	10.61	20.20
MgO	0.32	0.19	0.32
Na_2O	6.23	4.62	6.23
Loss	1.61	0.00	1.55
TOTAL	97.54		

ZrKα	251	YKα	2 ppm
SrKα	3411	RbKα	190
NiKα	0	ZnKα	96
ScKα	2.5	BaLα	2038
GaKα	26	NbKα	20
CsLα	4	PbLα	24
		CuKα	6

K_2O/MgO=6.102; FeO/Fe_2O_3=0.275;
Sr/Rb=17.95; Sr/Ba=1.67;
K/Rb=323; K/Ba=30; Ba/Rb=10.73;
Ca/Sr=7.23; K/Sr=18; Al/Ga=4081

Specimen no. 60224
Analysis no. CY95-1

Fe_2O_3	3.07	2.32	3.33
FeO	0.22		
MnO	0.05	0.04	0.06
TiO_2	0.33	0.20	0.33
CaO	0.32	0.23	0.31
K_2O	7.75	6.44	7.76
P_2O_5	0.06	0.03	0.06
SiO_2	60.49	28.28	60.39
Al_2O_3	20.52	10.86	20.75
MgO	0.34	0.20	0.34
Na_2O	4.43	3.28	4.43
Loss	1.20	0.00	1.18
TOTAL	98.79		

ZrKα	237	YKα	20 ppm
SrKα	2044	RbKα	215
NiKα	0	ZnKα	62
ScKα	4	BaLα	1197
GaKα	26	NbKα	19
CsLα	5.5	PbLα	29
		CuKα	12

K_2O/MgO=9.700; FeO/Fe_2O_3=0.071;
Sr/Rb=9.51; Sr/Ba=1.71;
K/Rb=299; K/Ba=54; Al/Ga=4177;
Ca/Sr=2.19; K/Sr=31.5

Specimen no. 60225
Analysis no. CY96-1

Fe_2O_3	2.98	2.56	3.70
FeO	0.61		
MnO	0.05	0.04	0.05
TiO_2	0.43	0.26	0.44
CaO	4.25	3.03	4.28
K_2O	2.24	1.86	2.24
P_2O_5	0.21	0.09	0.21
SiO_2	62.89	29.40	62.87
Al_2O_3	18.37	9.72	18.54
MgO	1.19	0.72	1.19
Na_2O	6.01	4.46	6.01
Loss	1.59	0.00	1.52
TOTAL	100.80		

ZrKα	206	YKα	19 ppm
SrKα	1980	RbKα	46
NiKα	0	ZnKα	14
ScKα	8	BaLα	869
CsLα	3.4	NbKα	25
GaKα	21	PbLα	0
		CuKα	17

K_2O/MgO=0.801; FeO/Fe_2O_3=0.205;
Sr/Rb=43.04; Sr/Ba=2.28;
K/Rb=404; K/Ba=21.40;
Al/Ga=4629; Ba/Rb=18.89,
Ca/Sr=15.34; K/Sr=9.39

Specimen no. 60226
Analysis no. CY97-2

Fe_2O_3	2.77	2.30	3.30
FeO	0.46		
MnO	0.05	0.04	0.05
TiO_2	0.20	0.12	0.20
CaO	0.84	0.60	0.81
K_2O	8.51	7.07	8.49
P_2O_5	0.05	0.02	0.05
SiO_2	62.91	29.41	62.95
Al_2O_3	19.43	10.28	19.66
MgO	0.32	0.19	0.32
Na_2O	4.44	3.30	4.44
Loss	0.54	0.00	0.49
TOTAL	100.51		

ZrKα	255	RbKα	126 ppm
SrKα	1552	ZnKα	36
NiKα	0	BaLα	815
ScKα	2.6	NbKα	10
GaKα	29	PbLα	6
CsLα	0.4	CuKα	72

K_2O/MgO=11.32; FeO/Fe_2O_3=0.167;
Sr/Rb=12.32; Sr/Ba=1.904;
K/Rb=561; K/Ba=87;
Al/Ga=3545; Ba/Rb=6.47;
Ca/Sr=3.87; K/Sr=45.52

Specimen no. 60227
Analysis no. CY98-2

Fe_2O_3	4.44	4.71	6.74
FeO	2.07		
MnO	0.12	0.09	0.12
TiO_2	0.90	0.54	0.90
CaO	1.46	1.05	1.43
K_2O	9.05	7.51	9.12
P_2O_5	0.19	0.08	0.19
SiO_2	55.32	25.86	55.36
Al_2O_3	18.02	9.54	18.13
MgO	1.17	0.71	1.17
Na_2O	2.61	1.94	2.61
Loss	3.63	0.00	3.40
TOTAL	98.99		

ZrKα	129	YKα	109 ppm
SrKα	872	RbKα	241
NiKα	1	ZnKα	173
ScKα	5	BaLα	6423
GaKα	24	NbKα	24
CsLα	28	PbLα	16
		CuKα	171

K_2O/MgO=3.29; FeO/Fe_2O_3=0.466;
Sr/Rb=3.62; Sr/Ba=0.136;
K/Rb=312; K/Ba=11.7;
Al/Ga=3975; Ca/Sr=11.97;
Ba/Rb=26.65; K/Sr=85.16

APPENDIX 2 - ANALYSED SPECIMENS cont.

	Oxide %	Element %	Nominal %
Specimen no. 60228			
Analysis no. CY99-1			
Fe_2O_3	2.60	2.04	2.96
FeO	0.33		
MnO	0.01	0.00	0.01
TiO_2	0.43	0.26	0.44
CaO	1.35	0.96	1.34
K_2O	3.93	3.26	3.93
P_2O_5	0.19	0.08	0.19
SiO_2	65.26	30.51	65.47
Al_2O_3	19.02	10.07	19.31
MgO	0.33	0.20	0.33
Na_2O	4.83	3.58	4.83
Loss	2.18	0.00	2.14
TOTAL	100.40		

ZrKα	162	RbKα	96 ppm
SrKα	1309	ZnKα	30
ScKα	9	BaLα	3237
GaKα	20	NbKα	11
CsLα	5	PbLα	12
YKα	100	CuKα	4

$K_2O/MgO=5.068$; $FeO/Fe_2O_3=0.125$;
Sr/Rb=13.64; Sr/Ba=0.404;
K/Rb=340; K/Ba=10;
Al/Ga=5035; Ba/Rb=33.72;
Ca/Sr=7.37; K/Sr=24.92

	Oxide %	Element %	Nominal %
Specimen no. 60229			
Analysis no. CY101-3			
Fe_2O_3	4.56	6.53	9.21
FeO	4.38		
MnO	0.17	0.13	0.17
TiO_2	1.15	0.69	1.11
CaO	9.00	6.43	8.85
K_2O	6.81	5.65	6.88
P_2O_5	0.66	0.29	0.67
SiO_2	51.15	23.91	51.08
Al_2O_3	13.71	7.26	13.61
MgO	3.86	2.33	3.83
Na_2O	1.84	1.36	1.84
Loss	2.03	0.00	1.54
TOTAL	99.23		

ZrKα	105	YKα	20 ppm
SrKα	2826	RbKα	194
NiKα	0	ZnKα	79
ScKα	13	BaLα	2131
GaKα	17	NbKα	12
CsLα	5	PbLα	0
		CuKα	97

$K_2O/MgO=0.751$; $FeO/Fe_2O_3=0.960$;
Sr/Rb=14.57; Sr/Ba=1.33;
K/Rb=291; K/Ba=27; Al/Ga=4271;
Ba/Rb=10.98; Ca/Sr=22.76;
K/Sr=20

	Oxide %	Element %	Nominal %
Specimen no. 60230			
Analysis no. CY102BLK-3			
Fe_2O_3	2.33	3.34	4.78
FeO	2.20		
MnO	0.13	0.10	0.13
TiO_2	0.31	0.19	0.31
CaO	4.60	3.29	4.56
K_2O	5.33	4.43	5.37
P_2O_5	0.07	0.03	0.07
SiO_2	56.59	26.46	56.36
Al_2O_3	18.26	9.66	18.31
MgO	2.17	1.31	2.17
Na_2O	5.55	4.12	5.55
Loss	1.67	0.00	1.43
TOTAL	99.22		

ZrKα	161	RbKα	170 ppm
SrKα	1261	ZnKα	68
NiKα	13	BaLα	253
ScKα	11	NbKα	8
GaKα	32	PbLα	9
CsLα	7.7	CuKα	19
YKα	4		

$K_2O/MgO=1.045$; $FeO/Fe_2O_3=0.942$;
Sr/Rb=7.42; Sr/Ba=4.98;
K/Rb=314; K/Ba=211;
Al/Ga=3019; Ba/Rb=1.49;
Ca/Sr=26.07; K/Sr=35.1

	Oxide %	Element %	Nominal %
Specimen no. 60231			
Analysis no. CY102WHT-1			
Fe_2O_3	1.36	1.56	2.23
FeO	0.78		
MnO	0.03	0.02	0.03
TiO_2	0.22	0.13	0.22
CaO	1.62	1.16	1.57
K_2O	8.43	7.00	8.43
P_2O_5	0.06	0.02	0.06
SiO_2	62.89	29.40	63.10
Al_2O_3	18.81	9.96	19.07
MgO	0.51	0.31	0.51
Na_2O	4.55	3.37	4.55
Loss	1.16	0.00	1.07
TOTAL	100.41		

ZrKα	197	ZnKα	18 ppm
SrKα	1971	BaLα	1277
ScKα	3.5	NbKα	4
GaKα	20	PbLα	7
CsLα	2	CuKα	19
RbKα	216	NiKα	2

$K_2O/MgO=7.034$; $FeO/Fe_2O_3=0.575$;
Sr/Rb=9.13; Sr/Ba=1.54;
K/Rb=390; K/Ba=66; Al/Ga=4980;
Ba/Rb=5.91; Ca/Sr=5.87;
K/Sr=35.51

	Oxide %	Element %	Nominal %
Specimen no. 60231			
Analysis no. CY103-1			
Fe_2O_3	1.42	2.35	3.37
FeO	1.75		
MnO	0.11	0.09	0.11
TiO_2	0.39	0.24	0.40
CaO	4.10	2.93	4.07
K_2O	4.46	3.71	4.48
P_2O_5	0.15	0.07	0.16
SiO_2	62.21	29.08	62.38
Al_2O_3	17.04	9.02	17.20
MgO	0.76	0.46	0.77
Na_2O	5.15	3.82	5.15
Loss	1.47	0.00	1.28
TOTAL	99.02		

ZrKα	189	RbKα	125 ppm
SrKα	1965	ZnKα	42
ScKα	5.4	BaLα	1417
GaKα	18	NbKα	13
CsLα	0.7	PbLα	0
YKα	23		

$K_2O/MgO=2.497$; $FeO/Fe_2O_3=1.228$;
Sr/Rb=15.39; Sr/Ba=1.39;
K/Rb=296; K/Ba=26;
Al/Ga=5011; Ba/Rb=11.34;
Ca/Sr=14.91; K/Sr=18.84

	Oxide %	Element %	Nominal %
Specimen no. 60232			
Analysis no. CY104-2			
Fe_2O_3	5.30	4.02	5.72
FeO	0.40		
MnO	0.11	0.09	0.11
TiO_2	0.40	0.24	0.40
CaO	3.37	2.41	3.26
K_2O	9.26	7.69	9.31
P_2O_5	0.09	0.04	0.09
SiO_2	55.30	25.85	55.18
Al_2O_3	20.59	10.90	20.76
MgO	0.41	0.25	0.41
Na_2O	2.16	1.60	2.16
Loss	2.00	0.00	1.96
TOTAL	99.41		

ZrKα	151	YKα	2 ppm
SrKα	3975	RbKα	205
NiKα	0	ZnKα	3320
ScKα	4	BaLα	3205
GaKα	27	NbKα	23.2
CsLα	8.34	PbLα	2
		CuKα	36

$K_2O/MgO=9.611$; $FeO/Fe_2O_3=0.076$;
Sr/Rb=19.39; Sr/Ba=1.24;
K/Rb=375; K/Ba=44;
Al/Ga=4037; Ba/Rb=15.63;
Ca/Sr=6.06; K/Sr=19.34

	Oxide %	Element %	Nominal %
Specimen no. 60233			
Analysis no. CY105-3			
Fe_2O_3	1.38	5.48	7.79
FeO	5.81		
MnO	0.16	0.13	0.16
TiO_2	0.54	0.33	0.53
CaO	10.10	7.22	10.12
K_2O	2.98	2.47	3.00
P_2O_5	0.12	0.05	0.12
SiO_2	54.42	25.44	54.12
Al_2O_3	14.76	7.81	14.64
MgO	5.48	3.31	5.45
Na_2O	3.72	2.76	3.72
Loss	1.28	0.00	0.63
TOTAL	100.76		

ZrKα	113	RbKα	116 ppm
SrKα	564	ZnKα	49
NiKα	29	BaLα	307
ScKα	27	NbKα	4
GaKα	16	PbLα	0
CsLα	2.7		
YKα	0		

$K_2O/MgO=0.231$; $FeO/Fe_2O_3=4.201$;
Sr/Rb=4.86; Sr/Ba=1.84;
K/Rb=257; K/Ba=97;
Al/Ga=4881; Ba/Rb=2.65;
Ca/Sr=128; K/Sr=43.86

	Oxide %	Element %	Nominal %
Specimen no. 60234			
Analysis no. CY106-3			
Fe_2O_3	2.97	2.62	3.74
FeO	0.69		
MnO	0.05	0.04	0.05
TiO_2	0.17	0.10	0.17
CaO	2.67	1.91	2.58
K_2O	9.64	8.00	9.69
P_2O_5	0.04	0.02	0.04
SiO_2	57.94	27.09	58.10
Al_2O_3	20.37	10.78	20.67
MgO	0.22	0.13	0.22
Na_2O	2.68	1.99	2.68
Loss	3.12	0.00	3.04
TOTAL	100.56		

ZrKα	35	RbKα	207 ppm
SrKα	2903	ZnKα	12
NiKα	0	BaLα	575
ScKα	4.4	NbKα	5
GaKα	28	PbLα	5
CsLα	1.4	CuKα	47
YKα	6		

$K_2O/MgO=18.65$; $FeO/Fe_2O_3=0.233$;
Sr/Rb=14.02; Sr/Ba=5.05;
K/Rb=387; K/Ba=139;
Al/Ga=3850; Ba/Rb=2.78;
Ca/Sr=6.57; K/Sr=27.57

	Oxide %	Element %	Nominal %
Specimen no. 60234			
Analysis no. CY106DK-3			
Fe_2O_3	5.67	6.09	8.61
FeO	2.74		
MnO	0.20	0.16	0.20
TiO_2	1.00	0.60	0.97
CaO	8.11	5.80	7.95
K_2O	7.00	5.81	7.07
P_2O_5	0.59	0.26	0.60
SiO_2	53.70	25.10	53.76
Al_2O_3	13.45	7.12	13.39
MgO	2.99	1.81	2.98
Na_2O	2.39	1.77	2.39
Loss	1.85	0.00	1.55
TOTAL	99.70		

ZrKα	150	RbKα	161 ppm
SrKα	2277	ZnKα	129
NiKα	0	NbKα	24
ScKα	15.5	PbLα	0
GaKα	22	CuKα	80
CsLα	6	BaLα	1537
YKα	36		

$K_2O/MgO=0.99$; $FeO/Fe_2O_3=0.483$;
Sr/Rb=14.14; Sr/Ba=1.48;
K/Rb=361; K/Ba=38;
Al/Ga=3236; Ba/Rb=9.55;
Ca/Sr=25.46; K/Sr=25.52

	Oxide %	Element %	Nominal %
Specimen no. 60235			
Analysis no. CY108-3			
Fe_2O_3	5.59	7.70	10.83
FeO	3.97		
MnO	0.21	0.16	0.20
TiO_2	1.13	0.68	1.10
CaO	11.06	7.90	10.99
K_2O	4.88	4.05	4.94
P_2O_5	0.82	0.36	0.83
SiO_2	48.84	22.83	48.61
Al_2O_3	12.62	6.60	12.44
MgO	4.80	2.90	4.74
Na_2O	2.18	1.61	2.18
Loss	1.44	0.00	1.00
TOTAL	98.54		

ZrKα	20	RbKα	110 ppm
SrKα	2706	ZnKα	126
NiKα	0	BaLα	1943
ScKα	25	NbKα	8
GaKα	19	PbLα	0
CsLα	31	CuKα	113

$K_2O/MgO=0.433$; $FeO/Fe_2O_3=0.602$;
Sr/Rb=24.6; Sr/Ba=1.39;
K/Rb=368; K/Ba=21;
Al/Ga=3516; Ba/Rb=17.66;
Ca/Sr=29.21; K/Sr=14.97

	Oxide %	Element %	Nominal %
Specimen no. 60236			
Analysis no. CY109-3			
Fe_2O_3	4.03	5.33	7.59
FeO	3.23		
MnO	0.13	0.10	0.12
TiO_2	0.84	0.51	0.84
CaO	4.52	3.23	4.44
K_2O	6.33	5.25	6.34
P_2O_5	0.36	0.15	0.36
SiO_2	57.69	26.97	57.52
Al_2O_3	16.57	8.77	16.56
MgO	1.58	0.95	1.57
Na_2O	3.93	2.91	3.93
Loss	0.69	0.00	0.33
TOTAL	99.89		

ZrKα	136	RbKα	140 ppm
SrKα	2784	ZnKα	52
NiKα	0	BaLα	1956
GaKα	21	NbKα	14
CsLα	0.5	PbLα	0
		CuKα	29

$K_2O/MgO=1.705$; $FeO/Fe_2O_3=0.800$;
Sr/Rb=20; Sr/Ba=1.42;
K/Rb=375; K/Ba=27;
Al/Ga=4176; Ba/Rb=13.97;
Ca/Sr=11.60; K/Sr=18.9

	Oxide %	Element %	Nominal %
Specimen no. 60237			
Analysis no. CY110-3			
Fe_2O_3	3.70	5.47	7.78
FeO	3.71		
MnO	0.16	0.13	0.16
TiO_2	0.52	0.31	0.51
CaO	9.08	6.49	9.04
K_2O	4.08	3.39	4.11
P_2O_5	0.11	0.05	0.11
SiO_2	55.03	25.73	54.81
Al_2O_3	14.25	7.54	14.15
MgO	5.04	3.04	5.01
Na_2O	3.87	2.87	3.87
Loss	1.21	0.00	0.80
TOTAL	100.77		

ZrKα	54	ZnKα	65 ppm
SrKα	895	BaLα	399
ScKα	24	NbKα	4
GaKα	0	PbLα	0
CsLα	3.5	CuKα	114
RbKα	126	NiKα	31

$K_2O/MgO=0.344$; $FeO/Fe_2O_3=1.004$;
Sr/Rb=7.1; Sr/Ba=2.24;
K/Rb=269; K/Ba=85;
Al/Ga=∞; Ba/Rb=3.17;
Ca/Sr=72.51; K/Sr=37.84

APPENDIX 2 - ANALYSED SPECIMENS cont.

	Oxide %	Element %	Nominal %
Specimen no. 60238			
Analysis no. CY111-2			
Fe_2O_3	2.93	3.12	4.43
FeO	1.38		
MnO	0.09	0.07	0.09
TiO_2	0.34	0.20	0.33
CaO	3.37	2.41	3.23
K_2O	10.34	8.58	10.37
P_2O_5	0.09	0.04	0.09
SiO_2	59.25	27.70	59.51
Al_2O_3	17.79	9.41	17.98
MgO	0.80	0.48	0.80
Na_2O	2.39	1.77	2.39
Loss	1.76	0.00	1.61
TOTAL	100.52		
ZrKα	112	RbKα	226 ppm
SrKα	3554	ZnKα	97
NiKα	0	BaLα	986
ScKα	6	NbKα	7
GaKα	23	PbLα	10
CsLα	4	CuKα	48
YKα	10		
$K_2O/MgO=5.5$; $FeO/Fe_2O_3=0.469$; $Sr/Rb=15.73$; $Sr/Ba=3.60$; $K/Rb=380$; $K/Ba=87$; $Al/Ga=4091$; $Ba/Rb=4.36$; $Ca/Sr=6.78$; $K/Sr=24.17$			
Specimen no. 60239			
Analysis no. CY113A-3			
Fe_2O_3	2.87	2.84	4.07
FeO	1.07		
MnO	0.08	0.06	0.08
TiO_2	0.62	0.37	0.62
CaO	2.61	1.87	2.55
K_2O	7.35	6.10	7.34
P_2O_5	0.16	0.07	0.16
SiO_2	61.38	28.70	61.41
Al_2O_3	18.36	9.72	18.53
MgO	0.79	0.48	0.79
Na_2O	4.44	3.29	4.44
Loss	0.73	0.00	0.61
TOTAL	100.47		
ZrKα	139	RbKα	145 ppm
SrKα	3434	BaLα	2241
NiKα	0	NbKα	16
ScKα	7	PbLα	8
GaKα	0	CuKα	38
CsLα	2		
YKα	28		
$K_2O/MgO=3.96$; $FeO/Fe_2O_3=0.373$; $Sr/Rb=23.68$; $Sr/Ba=1.53$; $K/Rb=421$; $K/Ba=27$; $Al/Ga=\infty$; $Ba/Rb=15.46$; $Ca/Sr=5.43$; $K/Sr=17.77$			
Specimen no. 60240			
Analysis no. CY113B-3			
Fe_2O_3	3.12	3.13	4.47
FeO	1.22		
MnO	0.16	0.13	0.16
TiO_2	0.49	0.29	0.48
CaO	3.99	2.85	3.89
K_2O	8.31	6.89	8.36
P_2O_5	0.15	0.07	0.15
SiO_2	57.19	26.74	57.28
Al_2O_3	18.98	10.04	19.17
MgO	0.88	0.53	0.89
Na_2O	2.97	2.21	2.97
Loss	2.64	0.00	2.50
TOTAL	100.10		
ZrKα	137	YKα	19 ppm
SrKα	3502	RbKα	188
NiKα	3	ZnKα	85
GaKα	24	BaLα	1218
CsLα	3	NbKα	10
PbLα	11	CuKα	87
$K_2O/MgO=4.018$; $FeO/Fe_2O_3=0.392$; $Sr/Rb=18.63$; $Sr/Ba=2.88$; $K/Rb=367$; $K/Ba=56.64$; $Al/Ga=4183$; $Ba/Rb=6.48$; $Ca/Sr=8.14$; $K/Sr=19.7$			
Specimen no. 60241			
Analysis no. CY113C-3			
Fe_2O_3	2.06	3.06	4.37
FeO	2.09		
MnO	0.17	0.13	0.17
TiO_2	0.52	0.31	0.51
CaO	4.11	2.94	4.01
K_2O	8.12	6.74	8.17
P_2O_5	0.15	0.07	0.15
SiO_2	56.26	26.30	56.21
Al_2O_3	19.49	10.32	19.65
MgO	0.78	0.47	0.79
Na_2O	3.85	2.86	3.85
Loss	2.10	0.00	1.87
TOTAL	99.70		
ZrKα	83	RbKα	187 ppm
SrKα	3462	ZnKα	71
NiKα	0	BaLα	1558
ScKα	5	NbKα	10
GaKα	23	PbLα	4
CsLα	20.52	CuKα	23
YKα	12		
$K_2O/MgO=4.43$; $FeO/Fe_2O_3=1.017$; $Sr/Rb=18.51$; $Sr/Ba=2.22$; $K/Rb=360$; $K/Ba=43$; $Al/Ga=4487$; $Ba/Rb=8.33$; $Ca/Sr=8.5$; $K/Sr=19.47$			
Specimen no. 60242			
Analysis no. CY114F-3			
Fe_2O_3	2.14	2.69	3.81
FeO	1.53		
MnO	0.12	0.09	0.12
TiO_2	0.64	0.38	0.62
CaO	3.36	2.40	3.20
K_2O	10.75	8.93	10.75
P_2O_5	0.22	0.10	0.22
SiO_2	62.08	29.02	62.56
Al_2O_3	15.18	8.03	15.32
MgO	1.26	0.76	1.27
Na_2O	2.33	1.73	2.33
Loss	0.43	0.00	0.26
TOTAL	100.05		
ZrKα	39	RbKα	223 ppm
SrKα	1494	ZnKα	106
NiKα	0	BaLα	1647
ScKα	7.5	NbKα	13
GaKα	23	PbLα	0
CsLα	0	CuKα	78
YKα	13		
$K_2O/MgO=3.63$; $FeO/Fe_2O_3=0.715$; $Sr/Rb=6.70$; $Sr/Ba=0.91$; $K/Rb=400$; $K/Ba=54.18$; $Al/Ga=3491$; $Ba/Rb=7.39$; $Ca/Sr=16$; $K/Sr=60$			
Specimen no.60242			
Analysis no. CY114DK-3			
Fe_2O_3	3.39	4.29	6.08
FeO	2.47		
MnO	0.35	0.27	0.34
TiO_2	0.41	0.24	0.40
CaO	4.62	3.30	4.42
K_2O	9.94	8.25	9.94
P_2O_5	0.30	0.13	0.30
SiO_2	61.31	28.66	61.74
Al_2O_3	13.12	6.94	13.17
MgO	1.41	0.85	1.41
Na_2O	2.69	2.00	2.69
Loss	0.43	0.00	0.14
TOTAL	100.43		
ZrKα	38	RbKα	211 ppm
SrKα	580	ZnKα	228
ScKα	12	BaLα	802
GaKα	95	NbKα	57
CsLα	1	PbLα	0
YKα	5		
$K_2O/MgO=3.00$; $FeO/Fe_2O_3=0.729$; $Sr/Rb=2.75$; $Sr/Ba=0.72$; $K/Rb=393$; $K/Ba=102.9$; $Al/Ga=730$; $Ba/Rb=3.80$; $Ca/Sr=57$; $K/Sr=206$			
Specimen no. 60243			
Analysis no. CY115-3			
Fe_2O_3	3.13	3.60	5.09
FeO	1.81		
MnO	0.15	0.12	0.15
TiO_2	0.56	0.33	0.54
CaO	4.51	3.23	4.28
K_2O	11.34	9.42	11.35
P_2O_5	0.16	0.07	0.16
SiO_2	60.91	28.48	61.36
Al_2O_3	15.38	8.14	15.52
MgO	0.85	0.51	0.85
Na_2O	2.04	1.51	2.04
Loss	0.81	0.00	0.61
TOTAL	101.66		
ZrKα	263	ZnKα	66 ppm
SrKα	1690	BaLα	1527
GaKα	23	NbKα	11
CsLα	0.66	PbLα	7
RbKα	212		
$K_2O/MgO=5.68$; $FeO/Fe_2O_3=0.578$; $Sr/Rb=7.97$; $Sr/Ba=1.11$; $K/Rb=444$; $K/Ba=61.65$; $Al/Ga=3539$; $Ba/Rb=7.20$; $Ca/Sr=19.00$; $K/Sr=55.7$			
Specimen no. 60244			
Analysis no. CY116-1			
Fe_2O_3	1.35	1.32	1.88
FeO	0.47		
MnO	0.10	0.07	0.10
TiO_2	0.19	0.12	0.19
CaO	2.34	1.67	2.25
K_2O	9.29	7.72	9.30
P_2O_5	0.08	0.03	0.08
SiO_2	62.97	29.44	63.38
Al_2O_3	17.50	9.26	17.75
MgO	0.57	0.34	0.57
Na_2O	3.59	2.66	3.59
Loss	1.03	0.00	0.98
TOTAL	99.49		
ZrKα	84	RbKα	174 ppm
SrKα	2668	ZnKα	25
NiKα	0	BaLα	1993
ScKα	3	NbKα	11
GaKα	19	PbLα	7
CsLα	4	CuKα	9
YKα	5		
$K_2O/MgO=6.935$; $FeO/Fe_2O_3=0.349$; $Al/Ga=4874$; $K/Ba=38.70$; $Ba/Rb=11.45$; $Ca/Sr=6.3$; $K/Sr=29$			
Specimen no. 60245			
Analysis no. CY117-3			
Fe_2O_3	4.09	7.75	11.05
FeO	5.58		
MnO	0.18	0.14	0.18
TiO_2	0.76	0.46	0.75
CaO	9.67	6.91	9.78
K_2O	1.20	1.00	1.21
P_2O_5	0.16	0.07	0.17
SiO_2	56.72	26.52	56.39
Al_2O_3	13.97	7.39	13.83
MgO	4.54	2.74	4.49
Na_2O	2.91	2.16	2.91
Loss	1.08	0.00	0.46
TOTAL	101.65		
ZrKα	53	RbKα	42 ppm
SrKα	159	ZnKα	77
NiKα	24	BaLα	262
ScKα	40	NbKα	7
GaKα	18	PbLα	0
CsLα	2	CuKα	50
YKα	37		
$K_2O/MgO=0.112$; $FeO/Fe_2O_3=1.146$; $Al/Ga=4106$; $Ba/Rb=6.24$; $K/Ba=38$; $Ca/Sr=435$; $K/Sr=63$			
Specimen no. 60246			
Analysis no. CY118-3			
Fe_2O_3	2.40	7.16	10.19
FeO	7.05		
MnO	0.19	0.15	0.19
TiO_2	0.75	0.45	0.74
CaO	10.05	7.19	10.17
K_2O	1.42	1.18	1.43
P_2O_5	0.14	0.06	0.14
SiO_2	55.92	26.14	55.61
Al_2O_3	14.20	7.52	14.07
MgO	5.01	3.02	4.97
Na_2O	2.66	1.97	2.66
Loss	1.52	0.00	0.74
TOTAL	101.32		
ZrKα	71	RbKα	72 ppm
SrKα	48	ZnKα	77
NiKα	36	BaLα	324
GaKα	17	NbKα	4
CsLα	6	PbLα	0
YKα	34	CuKα	119
$K_2O/MgO=0.121$; $FeO/Fe_2O_3=2.936$; $Al/Ga=4424$; $K/Ba=36.38$; $Ba/Rb=4.5$; $Ca/Sr=1496$; $K/Sr=245.6$			
Specimen no. 60247			
Analysis no. CY120			
Fe_2O_3	1.50	1.84	
FeO	1.14		
MnO	0.06	0.04	
TiO_2	0.38	0.23	
CaO	4.28	3.06	
K_2O	3.35	2.78	
P_2O_5	0.18	0.08	
SiO_2	63.90	29.87	
Al_2O_3	17.61	9.32	
MgO	0.92	0.56	
Na_2O	4.52	3.36	
Loss	0.58	0.00	
TOTAL	98.40		
Specimen no. 60248			
Analysis no. CY1231-1			
Fe_2O_3	1.20	1.59	
FeO	1.07		
MnO	0.10	0.08	
TiO_2	0.20	0.12	
CaO	2.65	1.89	
K_2O	7.72	6.41	
P_2O_5	0.06	0.03	
SiO_2	56.93	26.61	
Al_2O_3	20.20	10.69	
MgO	0.33	0.20	
Na_2O	6.81	5.05	
Loss	3.27	0.00	
TOTAL	100.54		

APPENDIX 2 - ANALYSED SPECIMENS cont.

	Oxide %	Element %	Nominal %
Specimen no. 60249			
Analysis no. 4-3			
Fe_2O_3	7.15	5.00	7.07
FeO			
MnO	0.22	0.17	0.22
TiO_2	0.97	0.58	0.95
CaO	5.41	3.86	5.21
K_2O	9.68	8.04	9.75
P_2O_5	0.23	0.10	0.24
SiO_2	55.08	25.75	55.18
Al_2O_3	16.87	8.93	16.94
MgO	1.16	0.70	1.16
Na_2O	0.48	0.36	0.48
Loss	1.42	0.00	1.42
TOTAL	98.67		
ZrKα	241	YKα	33 ppm
SrKα	3864	RbKα	233
NiKα	7	ZnKα	140
ScKα	6	BaLα	12
GaKα	24	PbLα	18
CsLα	15.84	CuKα	110

$K_2O/MgO=3.55$; $CaO/Na_2O=12.480$; $K_2O/Na_2O=20.887$; Al/Ga=3720

	Oxide %	Element %	Nominal %
Specimen no. 60250			
Analysis no. 18-3			
Fe_2O_3	11.20	7.84	11.03
FeO			
MnO	0.23	0.18	0.23
TiO_2	1.24	0.74	1.20
CaO	11.67	8.34	11.64
K_2O	4.51	3.75	4.58
P_2O_5	0.96	0.42	0.98
SiO_2	50.01	23.38	49.98
Al_2O_3	11.65	6.17	11.51
MgO	5.39	3.25	5.34
Na_2O	0.35	0.26	2.02
Loss	2.02	0.00	2.02
TOTAL	99.25		
ZrKα	77	RbKα	129 ppm
SrKα	2523	ZnKα	130
ScKα	27	BaLα	2257
NiKα	21	NbKα	9
GaKα	17	PbLα	0
CsLα	0	CuKα	132
YKα	20		

$K_2O/MgO=0.355$; $CaO/Na_2O=36.851$; $K_2O/Na_2O=12.886$; Al/Ga=3629

	Oxide %	Element %	Nominal %
Specimen no. 30251			
Analysis no. JROCK2-2			
Fe_2O_3	1.59	3.28	4.57
FeO	2.70		
MnO	1.89	1.46	1.88
TiO_2	0.38	0.23	0.38
CaO	2.63	1.88	2.54
K_2O	9.76	8.11	9.81
P_2O_5	0.09	0.04	0.09
SiO_2	55.47	25.93	55.32
Al_2O_3	20.30	10.74	20.45
MgO	0.34	0.20	0.34
Na_2O	1.75	1.30	1.75
Loss	1.80	0.00	1.50
TOTAL	98.70		
ZrKα	163	RbKα	270 ppm
SrKα	4636	ZnKα	2030
ScKα	4.3	BaLα	3259
NiKα	2	PbLα	2552
GaKα	31	CuKα	0
CsLα	2		
YKα	0		

$K_2O/MgO=9.49$; $FeO/Fe_2O_3=1.703$; K/Rb=300; K/Ba=24.85; Ba/Rb=12.07; Ca/Sr=4.06

	Oxide %	Element %	Nominal %
Specimen no. 60252			
Analysis no. RP4-2			
Fe_2O_3	1.97	1.47	2.12
FeO	0.12		
MnO	0.04	0.03	0.04
TiO_2	0.16	0.10	0.16
CaO	1.01	0.72	0.99
K_2O	6.69	5.55	6.66
P_2O_5	0.03	0.01	0.03
SiO_2	68.87	32.20	69.43
Al_2O_3	15.86	8.40	16.09
MgO	0.82	0.49	0.83
Na_2O	5.10	3.78	5.10
Loss	0.54	0.00	0.53
TOTAL	101.21		
ZrKα	96	ZnKα	42 ppm
SrKα	883	BaLα	988
NiKα	0	NbKα	9
ScKα	3	PbLα	0
GaKα	20	CuKα	47
CsLα	0		

$K_2O/MgO=3.47$; $FeO/Fe_2O_3=0.056$; Al/Ga=4200

	Oxide %	Element %	Nominal %
Specimen no. 60253			
Analysis no. RP10-3			
Fe_2O_3	3.18	7.83	11.14
FeO	7.21		
MnO	0.20	0.16	0.20
TiO_2	0.72	0.43	0.72
CaO	9.42	6.73	9.53
K_2O	1.56	1.29	1.57
P_2O_5	0.13	0.06	0.13
SiO_2	55.25	25.83	54.93
Al_2O_3	13.69	7.25	13.54
MgO	4.76	2.87	4.72
Na_2O	1.55	1.15	1.55
Loss	1.30	0.00	0.50
TOTAL	98.98		
ZrKα	36	RbKα	82 ppm
SrKα	218	ZnKα	97
NiKα	40	BaLα	344
ScKα	44	NbKα	5
GaKα	19	PbLα	0
CsLα	0	CuKα	0
YKα	28		

$K_2O/MgO=0.139$; $FeO/Fe_2O_3=2.267$; $CaO/Na_2O=6.717$; $K_2O/Na_2O=0.662$; Al/Ga=3816

	Oxide %	Element %	Nominal %
Specimen no. 60254			
Analysis no. RP17A-3			
Fe_2O_3	8.15	6.51	9.16
FeO	1.04		
MnO	0.19	0.15	0.19
TiO_2	1.12	0.67	1.08
CaO	10.09	7.21	9.91
K_2O	5.95	4.94	6.00
P_2O_5	0.71	0.31	0.72
SiO_2	54.23	25.35	54.23
Al_2O_3	13.44	7.12	13.37
MgO	3.45	2.08	3.42
Na_2O	0.88	0.65	0.88
Loss	0.45	0.00	0.33
TOTAL	99.70		
ZrKα	129	RbKα	137 ppm
SrKα	2464	NbKα	13
NiKα	23	PbLα	0
ScKα	16	CuKα	67
GaKα	19		
CsLα	0		
YKα	33		

$K_2O/MgO=0.735$; $CaO/Na_2O=12.967$; $K_2O/Na_2O=4.448$; Al/Ga=3747

	Oxide %	Element %	Nominal %
Specimen no. 60254			
Analysis no. RP17B-2			
Fe_2O_3	2.85	2.00	2.83
FeO			
MnO	0.07	0.05	0.07
TiO_2	0.33	0.20	0.32
CaO	3.12	2.23	2.97
K_2O	11.23	9.32	11.22
P_2O_5	0.04	0.02	0.04
SiO_2	63.34	29.61	63.92
Al_2O_3	16.03	8.48	16.24
MgO	1.02	0.62	1.03
Na_2O	1.26	0.93	1.26
Loss	0.22	0.00	0.33
TOTAL	99.61		
ZrKα	154	RbKα	298 ppm
SrKα	918	ZnKα	89
NiKα	7	BaLα	859
ScKα	4	NbKα	11
GaKα	25	PbLα	0
CsLα	0	CuKα	48
YKα	18		

$K_2O/MgO=4.685$; $CaO/Na_2O=2.737$; $K_2O/Na_2O=5.864$; Al/Ga=3392

	Oxide %	Element %	Nominal %
Specimen no. 60255			
Analysis no. RP19-3			
Fe_2O_3	3.28	4.47	6.37
FeO	2.95		
MnO	0.11	0.08	0.11
TiO_2	0.76	0.46	0.75
CaO	4.62	3.30	4.52
K_2O	6.69	5.55	6.70
P_2O_5	0.31	0.13	0.31
SiO_2	59.55	27.84	59.57
Al_2O_3	15.61	8.26	15.63
MgO	1.44	0.87	1.44
Na_2O	3.82	2.83	3.82
Loss	0.38	0.00	0.05
TOTAL	99.35		
ZrKα	183	RbKα	164 ppm
SrKα	2019	ZnKα	50
NiKα	7	BaLα	1460
ScKα	9	NbKα	11
GaKα	19	PbLα	0
CsLα	0.41	CuKα	0
YKα	39		

$K_2O/MgO=1.977$; $CaO/Na_2O=1.337$; $K_2O/Na_2O=1.152$ $FeO/Fe_2O_3=0.899$

	Oxide %	Element %	Nominal %
Specimen no. 60256			
Analysis no. RP20-2			
Fe_2O_3	2.03	1.62	2.33
FeO	0.26		
MnO	0.04	0.03	0.04
TiO_2	0.28	0.17	0.29
CaO	0.96	0.68	0.94
K_2O	6.38	5.30	6.38
P_2O_5	0.03	0.01	0.03
SiO_2	63.82	29.84	63.97
Al_2O_3	17.59	9.31	17.78
MgO	0.50	0.30	0.51
Na_2O	6.42	4.77	6.42
Loss	0.81	0.00	0.78
TOTAL	99.12		
ZrKα	150	RbKα	238 ppm
SrKα	2751	ZnKα	64
ScKα	4.5	BaLα	1376
GaKα	24	NbKα	3
CsLα	0	PbLα	13
YKα	0	CuKα	137

$K_2O/MgO=5.429$; $FeO/Fe_2O_3=0.126$; $CaO/Na_2O=0.165$; $K_2O/Na_2O=0.654$ Al/Ga=3883

	Oxide %	Element %	Nominal %
Specimen no. 60257			
Analysis no. RP20PLE-2			
Fe_2O_3	0.90	0.83	1.18
FeO	0.25		
MnO	0.01	0.01	0.01
TiO_2	0.13	0.08	0.12
CaO	1.38	0.99	1.31
K_2O	11.86	9.84	11.86
P_2O_5	0.00	0.00	0.00
SiO_2	63.79	29.82	64.41
Al_2O_3	18.07	9.56	18.42
MgO	0.23	0.14	0.23
Na_2O	1.26	0.93	1.26
Loss	1.01	0.00	0.98
TOTAL	98.89		
ZrKα	131	ZnKα	15 ppm
SrKα	2490	BaLα	989
ScKα	4.5	NbKα	4
GaKα	20	PbLα	23
CsLα	0	CuKα	10

$K_2O/MgO=21.94$; $FeO/Fe_2O_3=0.278$; $CaO/Na_2O=1.210$; $K_2O/Na_2O=10.403$

	Oxide %	Element %	Nominal %
Specimen no. 60258			
Analysis no. RP20DK-3			
Fe_2O_3	4.12	7.25	10.23
FeO	5.62		
MnO	0.22	0.17	0.21
TiO_2	0.76	0.45	0.74
CaO	8.07	5.77	7.93
K_2O	6.93	5.86	7.00
P_2O_5	0.08	0.04	0.08
SiO_2	52.10	24.35	51.99
Al_2O_3	12.78	6.76	12.65
MgO	4.86	2.93	4.83
Na_2O	0.53	0.39	0.53
Loss	1.74	0.00	1.11
TOTAL	97.80		
ZrKα	173	RbKα	169 ppm
SrKα	1618	ZnKα	152
ScKα	35	BaLα	597
GaKα	22	NbKα	12
CsLα	5.16	PbLα	0
YKα	28	CuKα	0

$K_2O/MgO=0.607$; $FeO/Fe_2O_3=1.364$; $CaO/Na_2O=16.828$; $K_2O/Na_2O=8.603$; Al/Ga=3073

	Oxide %	Element %	Nominal %
Specimen no. 60259			
Analysis no. RP25-2			
Fe_2O_3	3.63	3.74	5.33
FeO	1.55		
MnO	0.13	0.10	0.13
TiO_2	0.57	0.34	0.56
CaO	3.85	2.75	3.73
K_2O	8.26	6.86	8.27
P_2O_5	0.08	0.03	0.08
SiO_2	60.20	28.15	60.34
Al_2O_3	17.23	9.12	17.37
MgO	0.54	0.33	0.54
Na_2O	3.10	2.30	3.10
Loss	0.87	0.00	0.70
TOTAL	100.02		
ZrKα	180	YKα	16 ppm
SrKα	3169	RbKα	222
NiKα	8	ZnKα	56
ScKα	4	NbKα	13
GaKα	23	PbLα	0
CsLα	0	CuKα	20

$K_2O/MgO=6.52$; $FeO/Fe_2O_3=0.427$; $CaO/Na_2O=1.373$; $K_2O/Na_2O=1.753$

	Oxide %	Element %	Nominal %

Specimen no. 60260
Analysis no. RP30-3

Fe_2O_3	11.95	8.36	11.83
FeO			
MnO	0.17	0.13	0.17
TiO_2	1.15	0.69	1.12
CaO	7.80	5.58	7.67
K_2O	6.32	5.24	6.36
P_2O_5	1.05	0.46	1.06
SiO_2	52.69	24.63	52.57
Al_2O_3	15.35	6.53	12.20
MgO	4.64	2.80	4.59
Na_2O	1.58	1.17	1.58
Loss	1.27	0.00	1.27
TOTAL	100.97		

ZrKα	101	RbKα	205 ppm
SrKα	2229	ZnKα	478
ScKα	22	NbKα	10
GaKα	22	PbLα	0
CsLα	5.76	CuKα	83

$K_2O/MgO=0.579$; $CaO/Na_2O=5.456$; $K_2O/Na_2O=2.632$

Specimen no. 60261
Analysis no. S4-2

Fe_2O_3	1.82	1.28	1.84
FeO			
MnO	0.02	0.02	0.02
TiO_2	0.13	0.08	0.14
CaO	0.70	0.50	0.69
K_2O	6.14	5.10	6.13
P_2O_5	0.00	0.00	0.00
SiO_2	68.82	32.17	69.52
Al_2O_3	14.84	7.85	15.06
MgO	0.03	0.02	0.03
Na_2O	4.81	3.57	4.81
Loss	0.63	0.00	0.63
TOTAL	97.95		

ZrKα	83	RbKα	112 ppm
SrKα	820	ZnKα	44
NiKα	2	BaLα	912
ScKα	3.25	NbKα	6
GaKα	19	PbLα	5
YKα	0	CuKα	61

$K_2O/MgO=87.23$; $CaO/Na_2O=0.161$; $K_2O/Na_2O=0.840$

Specimen no. 60262
Analysis no. S10

Fe_2O_3	3.14	2.19	3.12
FeO			
MnO	0.03	0.03	0.03
TiO_2	0.58	0.35	0.57
CaO	2.46	1.76	2.37
K_2O	10.01	8.31	10.02
P_2O_5	0.09	0.04	0.09
SiO_2	62.78	29.35	63.29
Al_2O_3	15.45	8.18	15.62
MgO	0.91	0.55	0.92
Na_2O	2.30	1.70	2.30
Loss	0.50	0.00	0.50
TOTAL	98.26		

ZrKα	121	RbKα	283 ppm
SrKα	950	ZnKα	33
NiKα	9	BaLα	1569
ScKα	14	NbKα	13
GaKα	25	PbLα	0
CsLα	0.99	CuKα	163

$K_2O/MgO=4.635$; $CaO/Na_2O=1.182$; $K_2O/Na_2O=2.863$

Specimen no. 60263
Analysis no. X44-2

Fe_2O_3	3.20	2.24	3.22
FeO			
MnO	0.15	0.12	0.15
TiO_2	0.30	0.18	0.30
CaO	1.50	1.07	1.46
K_2O	7.90	6.56	7.92
P_2O_5	0.06	0.02	0.06
SiO_2	60.04	28.07	60.06
Al_2O_3	17.73	9.38	17.87
MgO	0.46	0.28	0.46
Na_2O	6.83	5.07	6.83
Loss	1.06	0.00	1.06
TOTAL	99.24		

ZrKα	381	RbKα	135 ppm
SrKα	4637	ZnKα	89
NiKα	0	BaLα	3457
GaKα	28	PbLα	62
CsLα	11	CuKα	0
YKα	24		

$K_2O/MgO=7.30$; $Al/Ga=3350$; $K/Rb=486$; $K/Ba=18.97$; $Ba/Rb=25.61$

Specimen no.60264
Analysis no. X50-2

Fe_2O_3	1.97	1.38	1.98
FeO	0.14		
MnO	0.02	0.02	0.02
TiO_2	0.28	0.17	0.28
CaO	0.26	0.19	0.25
K_2O	7.45	6.18	7.46
P_2O_5	0.04	0.02	0.04
SiO_2	62.12	29.04	62.26
Al_2O_3	20.04	10.61	20.34
MgO	0.20	0.12	0.20
Na_2O	4.66	3.46	4.66
Loss	2.02	0.00	2.00
TOTAL	99.03		

ZrKα	240	YKα	3 ppm
SrKα	1728	RbKα	236
NiKα	0	ZnKα	28
ScKα	3.3	BaLα	1598
GaKα	26	NbKα	18
CsLα	0.55	PbLα	57
		CuKα	71

$K_2O/MgO=15.85$; $FeO/Fe_2O_3=0.075$; $Al/Ga=4081$; $K/Ba=38.70$; $Ba/Rb=6.77$

Specimen no. 60265
Analysis no. AMPH2

Fe_2O_3	3.28	10.73
FeO	7.45	
MnO	0.29	0.22
TiO_2	0.48	0.29
CaO	11.79	8.43
K_2O	0.86	0.72
P_2O_5	0.07	0.03
SiO_2	49.41	23.09
Al_2O_3	14.53	7.69
MgO	8.37	5.05
Na_2O	2.54	1.89
Loss	1.98	0.00
TOTAL	101.05	

ZrKα	29	ppm
SrKα	545	
YKα	19	
RbKα	11	
CrKα	349	
NbKα	2	

$Rb/Sr=0.018$; $K/Rb=727$; $Zr/P_2O_5=0.04$

Specimen no. 60265
Analysis no. AMPH2

Fe_2O_3	3.31	7.56
FeO	7.50	0.22
MnO	0.29	0.22
TiO_2	0.47	0.28
CaO	11.77	8.41
K_2O	0.86	0.72
P_2O_5	0.06	0.03
SiO_2	49.90	23.31
Al_2O_3	14.63	7.74
MgO	8.53	5.14
Na_2O	2.38	1.76
Loss	1.98	0.00
TOTAL	101.67	

ZrKα	29	ppm
SrKα	545	
YKα	19	
RbKα	11	
CrKα	349	
NbKα	2	

$Rb/Sr=0.018$; $K/Rb=727$; $Zr/P_2O_5=0.05$

Specimen no. 60265
Analysis no. AMPH3

Fe_2O_3	3.35	7.65
FeO	7.59	
MnO	0.21	0.16
TiO_2	0.49	0.30
CaO	11.91	8.51
K_2O	0.58	0.48
P_2O_5	0.05	0.02
SiO_2	49.58	23.16
Al_2O_3	15.03	7.95
MgO	9.36	5.65
Na_2O	2.24	1.66
Loss	1.96	0.00
TOTAL	102.34	

ZrKα	23	ppm
SrKα	227	
YKα	22	
RbKα	6	
CrKα	455	
NbKα	2	

$Rb/Sr=0.029$; $Zr/P_2O_5=0.05$; $K/Rb=706$

Specimen no. 60265
Analysis no. AMPH5

Fe_2O_3	11.43	7.99
FeO	7.93	
MnO	0.35	0.27
TiO_2	0.61	0.37
CaO	10.11	7.23
K_2O	1.17	0.97
P_2O_5	0.07	0.03
SiO_2	48.92	22.85
Al_2O_3	15.47	8.19
MgO	8.79	5.30
Na_2O	2.55	1.89
Loss	1.69	0.00
TOTAL	101.15	

ZrKα	34	CrKα	466 ppm
SrKα	692	NbKα	3
YKα	34		
RbKα	17		

$Rb/Sr=0.024$; $Zr/P_2O_5=0.05$; $K/Rb=581$

Specimen no. 60265
Analysis no. AMPH6

Fe_2O_3	3.35	7.65
FeO	6.59	
MnO	0.23	0.18
TiO_2	0.40	0.24
CaO	12.96	9.26
K_2O	0.46	0.39
P_2O_5	0.05	0.02
SiO_2	49.42	23.09
Al_2O_3	14.07	7.45
MgO	9.30	5.61
Na_2O	2.44	1.81
Loss	1.29	0.00
TOTAL	101.56	

ZrKα	19	CrKα	760 ppm
SrKα	343	NbKα	0.1
YKα	19		
RbKα	5		

$Zr/P_2O_5=0.04$; $Rb/Sr=0.019$; $K/Rb=609$

Specimen no. 60265
Analysis no. AMPH7

Fe_2O_3	3.50	7.99
FeO	7.93	
MnO	0.36	0.28
TiO_2	0.65	0.39
CaO	10.13	7.24
K_2O	1.23	1.02
P_2O_5	0.07	0.03
SiO_2	47.90	22.38
Al_2O_3	14.73	7.79
MgO	8.47	5.11
Na_2O	2.71	2.01
Loss	1.71	0.00
TOTAL	99.38	

ZrKα	32	RbKα	22 ppm
SrKα	609	CrKα	437
YKα	21	NbKα	4

$Rb/Sr=0.038$; $K/Rb=430$; $Zr/P_2O_5=0.05$

Analysis no. CY5AMPH

Fe_2O_3	7.46	14.72	20.71
FeO	12.23		
MnO	0.30	0.23	0.29
TiO_2	2.30	1.38	2.26
CaO	11.33	8.10	11.54
K_2O	1.97	1.64	2.00
P_2O_5	0.23	0.10	0.23
SiO_2	37.23	17.41	36.28
Al_2O_3	12.62	6.68	12.10
MgO	9.39	5.67	9.10
Na_2O	1.38	1.02	1.38
Loss	1.89	0.00	0.53
TOTAL	99.69		

ZrKα	0	BaLα	585 ppm
SrKα	1090		
RbKα	3		

$K_2O/MgO=0.0892$; $FeO/Fe_2O_3=1.639$; $CaO/Na_2O=9.074$; $K_2O/Na_2O=0.939$; $Sr/Ba=1.86$; $K/Ba=27.96$; $Ba/Rb=195$

APPENDIX 2 - ANALYSED SPECIMENS cont.

	Oxide %	Element %	Nominal %
Analysis no. CY18AMPH			
Fe_2O_3	3.54	11.47	16.28
FeO	11.56		
MnO	0.37	0.28	0.36
TiO_2	0.72	0.43	0.71
CaO	11.01	7.87	11.25
K_2O	1.35	1.12	1.36
P_2O_5	0.03	0.01	0.03
SiO_2	43.26	20.22	42.45
Al_2O_3	12.70	6.72	12.29
MgO	10.79	6.51	10.60
Na_2O	1.54	1.14	1.54
Loss	3.20	0.00	1.91
TOTAL	100.07		
BaLα	172 ppm		
FeO/Fe_2O_3=3.27; K/Ba=34.2			

	Oxide %	Element %	Nominal %
Analysis no. CY18AMPH			
Fe_2O_3	3.28	11.28	16.01
FeO	11.56		
MnO	0.34	0.26	0.33
TiO_2	0.73	0.43	0.72
CaO	11.70	8.36	11.95
K_2O	1.22	1.02	1.24
P_2O_5	0.00	0.00	0.00
SiO_2	43.55	20.36	42.76
Al_2O_3	12.26	6.49	11.87
MgO	11.12	6.71	10.92
Na_2O	1.70	1.26	1.70
Loss	3.20	0.00	1.91
TOTAL	100.65		
BaLα	140 ppm		
FeO/Fe_2O_3=3.52			

	Oxide %	Element %	Nominal %
Analysis no. CY91AMPH			
Fe_2O_3	23.09	16.15	22.71
FeO			
MnO	0.52	0.40	0.51
TiO_2	2.14	1.28	2.09
CaO	11.71	8.37	11.83
K_2O	3.04	2.52	3.09
P_2O_5	0.22	0.09	0.22
SiO_2	36.76	17.19	35.89
Al_2O_3	13.91	7.36	13.39
MgO	6.91	4.17	6.68
Na_2O	1.33	0.99	1.33
Loss	2.12	0.00	2.12
TOTAL	101.75		
BaLα	1079 ppm		
K/Ba=23.4			

	Oxide %	Element %	Nominal %
Analysis no. CY2DIOP			
Fe_2O_3	10.53	7.37	10.29
MnO	0.71	0.55	0.70
TiO_2	0.09	0.05	0.08
CaO	22.09	15.79	22.51
K_2O	0.08	0.07	0.08
P_2O_5	0.00	0.00	0.00
SiO_2	52.68	24.63	52.97
Al_2O_3	1.88	1.00	1.84
MgO	12.19	7.35	12.05
Na_2O	1.13	0.84	1.13
Loss	0.98	0.00	0.98
TOTAL	102.37		
BaLα	0 ppm		

	Oxide %	Element %	Nominal %
Analysis no. CYMELANITE			
Fe_2O_3	25.02	17.50	23.63
MnO	0.79	0.61	0.75
TiO_2	2.92	1.75	2.58
CaO	32.65	23.33	33.30
K_2O	0.05	0.04	0.05
P_2O_5	0.10	0.04	0.10
SiO_2	34.61	16.18	34.51
Al_2O_3	2.06	1.09	1.98
MgO	1.90	1.14	1.81
Na_2O	1.05	0.78	1.05
Loss	0.73	0.00	0.73
TOTAL	101.87		
BaLα	268 ppm		

Appendix 3

CIPW NORMS

The CIPW norms were calculated using a computer program devised by Dr Le Maitre (University of Melbourne) and supplied by Dr D. Ellis, using the Burroughs B6700 computer at the University of Tasmania.

****CYS **** #60147

	WT.PC	MOL.PC	MOL.PR		ATOMS		CIPW NORM	
SIO2	59.32	64.31	0.9936	SI	56.017	QTZ	5.70
TIO2	0.59	0.48	0.0074	TI	0.405	C	0.03
AL2O3	16.42	10.75	0.1650	AL	13.109	ZR	0.00
FE2O3	3.13	1.21	0.0195	FE3	2.152	OR	21.75
FEO	3.43	3.53	0.0395	FE2	3.495	AB	43.55
MNO	0.22	0.20	0.0031	MN	0.170	AN	12.54
MGO	1.83	2.97	0.0429	MG	2.518	LC	0.00
CAO	4.83	5.57	0.0970	CA	4.776	NE	0.00
NA2O	5.01	5.27	0.0803	NA	3.871	KP	0.00
K2O	3.65	2.55	0.0391	K	4.289	HL	0.00
H2O+	0.93	3.35	0.0544	OH	5.971	TH	0.00
H2O-	0.00	0.00	0.0000		0.000	NC	0.00
P2O5	0.11	0.14	0.0022	P	0.240	AC	0.00
CO2	0.00	0.00	0.0000	C	0.000	NS	0.00
OTHER	0.00	0.00	0.0000		0.000	KS	0.00
ZRO2	0.00	0.00	0.0000	ZR	0.000	DI	7.71
CR2O3	0.00	0.00	0.0000	CR	0.000	WO	0.00
V2O3	0.00	0.00	0.0000	V	0.000	HY	2.35
NIO	0.00	0.00	0.0000	NI	0.000	OL	0.00
COO	0.00	0.00	0.0000	CO	0.000	CS	0.00
BAO	0.00	0.00	0.0000	BA	0.000	MT	4.54
SRO	0.00	0.00	0.0000	SR	0.000	CM	0.00
F	0.00	0.00	0.0000	F	0.000	HM	0.00
CL	0.00	0.00	0.0000	CL	0.000	IL	1.12
SO3	0.00	0.00	0.0000	S	0.000	SPH	0.00
S	0.00	0.00	0.0000	S	0.000	PF	0.00
LI2O	0.00	0.00	0.0000	LI	0.000	RU	0.00
RB2O	0.00	0.00	0.0000	RB	0.000	AP	0.00
TOTAL	99.77			O	160.000	HAP	0.73
LESS O	0.00					FL	0.00
TOTAL	99.77					PY	0.00
						CC	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	23.36	27.43
AB+NE	55.23	56.74
AN	16.35	15.83
QTZ	49.42	70.55
NE	32.63	19.85
KP	17.70	9.60
CAO+BAO+SRO	35.96	42.06
NA2O	56.92	39.06
K2O+RB2O	27.12	18.89
MGO	11.52	18.91
ALK+RB2O	34.12	49.42
FE AS FEO	34.36	31.67
FE2/FE2+FE3	48.93	48.97

MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.97
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.77
FE/FE+MG	0.19
OR+AB+AN	76.63
NE+LC+KP	0.00
AC+DI+HY*	10.04
OL+CS	0.00
MT+CM+HM	4.54
IL+SPH**	1.12
DIFF.IND.	69.54
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.727

****CYSOCL **** #60146

	WT.PC	MOL.PC	MOL.PR		ATOMS		CIPW NORM
SIO2	56.36	56.11	0.9349	SI	51.118	QTZ	15.06
TIO2	0.56	0.50	0.0070	TI	0.452	C	0.00
AL2O3	14.77	8.98	0.1449	AL	16.366	ZR	0.00
FE2O3	1.13	0.64	0.0071	FE3	0.799	OR	6.21
FEO	9.12	7.57	0.1269	FE2	7.170	AB	4.85
MNO	0.20	0.17	0.0028	MN	0.159	AN	34.73
MGO	4.87	7.69	0.1304	MG	6.823	LC	0.00
CAO	9.06	10.42	0.1782	CA	9.952	NE	0.00
NA2O	0.55	0.55	0.0089	NA	1.002	KP	0.00
K2O	1.05	0.69	0.0111	K	1.259	HL	0.00
H2O+	1.81	6.23	0.1005	OH	11.351	TH	0.00
H2O-	0.00	0.00	0.0000		0.000	NC	0.00
P2O5	0.10	0.04	0.0007	P	0.080	AC	0.00
CO2	0.00	0.00	0.0000	C	0.000	NS	0.00
OTHER	0.00	0.00	0.0000		0.000	KS	0.00
ZRO2	0.00	0.00	0.0000	ZR	0.000	DI	11.36
CR2O3	0.00	0.00	0.0000	CR	0.000	WO	0.00
V2O3	0.00	0.00	0.0000	V	0.000	HY	21.56
NIO	0.00	0.00	0.0000	NI	0.000	OL	0.00
COO	0.00	0.00	0.0000	CO	0.000	CS	0.00
BAO	0.00	0.00	0.0000	BA	0.000	MT	1.64
SRO	0.00	0.00	0.0000	SR	0.000	CM	0.00
F	0.00	0.00	0.0000	F	0.000	HM	0.00
CL	0.00	0.00	0.0000	CL	0.000	IL	1.22
SO3	0.00	0.00	0.0000	S	0.000	SPH	0.00
S	0.00	0.00	0.0000	S	0.000	PF	0.00
LI2O	0.00	0.00	0.0000	LI	0.000	RU	0.00
RB2O	0.00	0.00	0.0000	RB	0.000	AP	0.00
TOTAL	98.50			O	160.000	HAP	0.24
LESS O	0.00					FL	0.00
TOTAL	98.50					PY	0.00
						CC	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	13.61	13.52
AB+NE	10.21	10.76
AN	76.13	75.72
QTZ	76.67	89.20
NE	9.72	4.79
KP	13.60	6.01
CAO+BAO+SRO	86.06	89.80
NA2O	4.79	4.52
K2O+RB2O	9.15	5.68
MGO	29.93	42.42
ALK+RB2O	9.52	7.03
FE AS FEO	61.50	50.54
FE2/FE2+FE3	90.16	90.17

MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.81
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.50
FE/FE+MG	0.49
OR+AB+AN	45.59
NE+LC+KP	0.00
AC+DI+HY*	32.95
OL+CS	0.00
MT+CM+HM	1.64
IL+SPH**	1.22
DIFF.IND.	25.92
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CYSAMPH ****

	WT.PC	MOL.PC	MOL.PR		ATOMS		CIPW NORM
SIO2	37.23	39.26	0.6195	SI	38.515	QTZ	0.00
TIO2	2.30	1.82	0.0288	TI	1.790	C	0.00
AL2O3	12.62	7.84	0.1238	AL	15.390	ZR	0.00
FE2O3	7.46	2.96	0.0467	FE3	5.803	OR	0.00
FEO	12.23	10.79	0.1702	FE2	10.582	AB	0.00
MNO	0.36	0.27	0.0043	MN	0.263	AN	22.43
MGO	9.39	14.76	0.2329	MG	14.478	LC	9.13
CAO	11.33	12.80	0.2020	CA	12.560	NE	6.33
NA2O	1.38	1.41	0.0223	NA	2.768	KP	0.00
K2O	1.97	1.33	0.0209	K	2.601	HL	0.00
H2O+	1.89	6.65	0.1049	OH	13.044	TH	0.00
H2O-	0.00	0.00	0.0000		0.000	NC	0.00
P2O5	0.23	0.10	0.0016	P	0.201	AC	0.00
CO2	0.00	0.00	0.0000	C	0.000	NS	0.00
OTHER	0.00	0.00	0.0000		0.000	KS	0.00
ZRO2	0.00	0.00	0.0000	ZR	0.000	DI	24.00
CR2O3	0.00	0.00	0.0000	CR	0.000	WO	0.00
V2O3	0.00	0.00	0.0000	V	0.000	HY	0.00
NIO	0.00	0.00	0.0000	NI	0.000	OL	18.00
COO	0.00	0.00	0.0000	CO	0.000	CS	0.85
BAO	0.00	0.00	0.0000	BA	0.000	MT	10.62
SRO	0.00	0.00	0.0000	SR	0.000	CM	0.00
F	0.00	0.00	0.0000	F	0.000	HM	0.00
CL	0.00	0.00	0.0000	CL	0.000	IL	4.37
SO3	0.00	0.00	0.0000	S	0.000	SPH	0.00
S	0.00	0.00	0.0000	S	0.000	PF	0.00
LI2O	0.00	0.00	0.0000	LI	0.000	RU	0.00
RB2O	0.00	0.00	0.0000	RB	0.000	AP	0.00
TOTAL	98.33			O	160.000	HAP	0.54
LESS O	0.00					FL	0.00
TOTAL	98.33					PY	0.00
						CC	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	24.10	25.06
AB+NE	16.70	26.67
AN	59.20	48.29
QTZ	16.26	32.63
NE	43.93	34.73
KP	42.81	32.63
CAO+BAO+SRO	77.18	82.39
NA2O	9.40	9.08
K2O+RB2O	13.42	8.53
MGO	29.36	42.82
ALK+RB2O	10.47	7.94
FE AS FEO	60.17	49.25
FE2/FE2+FE3	65.12	65.12

MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.68
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.33
FE/FE+MG	0.30
OR+AB+AN	22.43
NE+LC+KP	15.46
AC+DI+HY*	24.00
OL+CS	18.84
MT+CM+HM	10.62
IL+SPH**	4.37
DIFF.IND.	15.46
SI UNSAT.	14.94

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CY7A **** #60148

	WT.PC	MOL.PC	MOL.PR		ATOMS		CIPW NORM
SIO2	67.23	71.57	1.1187	SI	58.543	QTZ	14.99
TIO2	0.36	0.29	0.0045	TI	0.236	C	0.54
AL2O3	17.93	11.25	0.1759	AL	18.405	ZR	0.00
FE2O3	1.35	0.54	0.0085	FE3	0.385	OR	26.36
FEO	0.09	0.08	0.0013	FE2	0.066	AB	44.42
MNO	0.00	0.00	0.0000	MN	0.000	AN	10.72
MGO	0.00	0.00	0.0000	MG	0.000	LC	0.00
CAO	2.28	2.60	0.0407	CA	2.128	NE	0.00
NA2O	5.25	5.42	0.0847	NA	8.863	KP	0.00
K2O	4.46	3.03	0.0474	K	4.955	HL	0.00
H2O+	1.46	5.18	0.0810	OH	8.481	TH	0.00
H2O-	0.00	0.00	0.0000		0.000	NC	0.00
P2O5	0.09	0.04	0.0006	P	0.066	AC	0.00
CO2	0.00	0.00	0.0000	C	0.000	NS	0.00
OTHER	0.00	0.00	0.0000		0.000	KS	0.00
ZRO2	0.00	0.00	0.0000	ZR	0.000	DI	0.00
CR2O3	0.00	0.00	0.0000	CR	0.000	WO	0.00
V2O3	0.00	0.00	0.0000	V	0.000	HY	0.00
NIO	0.00	0.00	0.0000	NI	0.000	OL	0.00
COO	0.00	0.00	0.0000	CO	0.000	CS	0.00
BAO	0.00	0.00	0.0000	BA	0.000	MT	0.00
SRO	0.00	0.00	0.0000	SR	0.000	CM	0.00
F	0.00	0.00	0.0000	F	0.000	HM	1.35
CL	0.00	0.00	0.0000	CL	0.000	IL	0.19
SO3	0.00	0.00	0.0000	S	0.000	SPH	0.00
S	0.00	0.00	0.0000	S	0.000	PF	0.00
LI2O	0.00	0.00	0.0000	LI	0.000	RU	0.26
RB2O	0.00	0.00	0.0000	RB	0.000	AP	0.00
TOTAL	100.50			O	160.000	HAP	0.21
LESS O	0.00					FL	0.00
TOTAL	100.50					PY	0.00
						CC	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	32.56	31.69
AB+NE	54.50	55.97
AN	13.16	12.74
QTZ	54.44	74.65
NE	23.06	16.26
KP	17.46	9.07
CAO+BAO+SRO	19.02	23.54
NA2O	43.79	49.04
K2O+RB2O	37.20	27.42
MGO	0.00	0.00
ALK+RB2O	83.13	87.91
FE AS FEO	11.85	12.09
FE2/FE2+FE3	6.90	6.90

MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.46
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.50
FE/FE+MG	0.00
OR+AB+AN	61.50
NE+LC+KP	0.00
AC+DI+HY*	0.00
OL+CS	0.00
MT+CM+HM	1.35
IL+SPH**	0.45
DIFF.IND.	85.77
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.75

****CY7 **** #60149

	WT.PC	MOL.PC	MOL.PR
SIO2	68.62	71.48	1.1907
TIO2	0.35	0.28	0.0044
AL2O3	17.52	11.10	0.1721
FE2O3	2.18	0.87	0.0135
FEO	0.08	0.08	0.0013
MNO	0.00	0.00	0.0000
MGO	0.01	0.02	0.0002
CAO	2.38	2.75	0.0426
NA2O	3.75	3.94	0.0611
K2O	5.44	3.72	0.0578
H2O+	1.60	5.73	0.0888
H2O-	0.00	0.00	0.0000
P2O5	0.08	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.08		
LESS O	0.00		
TOTAL	100.08		

	ATOMS		
SI	58.450	QTZ	18.85
TI	0.221	C	1.57
AL	16.123	ZR	0.00
FE3	1.418	OR	32.15
FE2	0.368	AB	33.07
MN	0.000	AN	11.33
MG	0.013	LC	0.00
CA	2.245	NE	0.00
NA	6.440	NP	0.00
K	6.084	HL	0.00
H	9.356	TH	0.00
	0.000	NC	0.00
P	0.059	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	0.00
CR	0.000	WO	0.00
V	0.000	HY	0.02
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	0.00
SR	0.000	CM	0.00
F	0.000	HM	2.15
CL	0.000	IL	0.19
S	0.000	SPH	0.00
LI	0.000	PF	0.00
RB	0.000	RU	0.25
C	160.000	AP	0.00
		HAP	0.19
		FL	0.00
		PY	0.00
		CC	0.00
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	1.60
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	100.08
		FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	42.56	41.47
AB+NE	42.44	43.90
AN	15.00	14.63
QTZ	57.10	76.85
NE	20.91	11.91
KP	21.99	11.25
CAO+BAO+SRO	20.57	26.39
NA2O	32.62	37.85
K2O+RB2O	46.82	35.76
MGO	0.09	0.17
ALK+RB2O	81.94	30.70
FE AS FEO	17.97	19.13
FE2/FE2+FE3	4.45	4.45

OR+AB+AN	75.55
NE+LC+KP	0.00
AC+DI+HY*	0.02
CL+CS	0.00
MT+CM+HM	2.15
IL+SPH**	0.44
DIFF.IND.	83.07
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.60

****CY7E **** #60150

	WT.PC	MOL.PC	MOL.PR
SIO2	65.60	68.68	1.0916
TIO2	0.32	0.27	0.0049
AL2O3	19.16	11.39	0.1741
FE2O3	2.16	0.86	0.0135
FEO	0.19	0.15	0.0054
MNO	0.01	0.01	0.0001
MGO	0.14	0.22	0.0035
CAO	3.02	3.44	0.0539
NA2O	4.36	4.50	0.0703
K2O	4.67	3.17	0.0496
H2O+	1.68	5.96	0.0933
H2O-	0.00	0.00	0.0000
P2O5	0.10	0.05	0.0007
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.63		
LESS O	0.00		
TOTAL	100.63		

	ATOMS		
SI	57.436	QTZ	15.97
TI	0.224	C	0.68
AL	18.710	ZR	0.00
FE3	1.421	OR	27.60
FE2	0.295	AB	36.89
MN	0.007	AN	14.53
MG	0.182	LC	0.00
CA	2.829	NE	0.00
NA	7.383	NP	0.00
K	5.263	HL	0.00
H	3.786	TH	0.00
	0.000	NC	0.00
P	0.074	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	0.00
CR	0.000	WO	0.00
V	0.000	HY	0.35
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	0.30
SR	0.000	CM	0.00
F	0.000	HM	1.95
CL	0.000	IL	0.55
S	0.000	SPH	0.00
LI	0.000	PF	0.00
RB	0.000	RU	0.00
C	160.000	AP	0.00
		HAP	0.24
		FL	0.00
		PY	0.00
		CC	0.00
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	1.68
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	100.63
		FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	35.02	34.04
AB+NE	46.80	48.28
AN	18.18	17.68
QTZ	55.67	75.66
NE	24.84	14.28
KP	19.49	10.07
CAO+BAO+SRO	25.06	30.99
NA2O	36.18	40.47
K2O+RB2O	38.76	28.53
MGO	1.22	2.23
ALK+RB2O	78.43	76.86
FE AS FEO	20.35	20.91
FE2/FE2+FE3	17.07	17.07

OR+AB+AN	78.82
NE+LC+KP	0.00
AC+DI+HY*	0.35
OL+CS	0.00
MT+CM+HM	2.25
IL+SPH**	0.65
DIFF.IND.	80.46
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.70

****CY8 **** #60151

	WT.PC	MOL.PC	MOL.PR
SIO2	62.90	68.45	1.0467
TIO2	0.43	0.35	0.0054
AL2O3	17.77	11.40	0.1743
FE2O3	2.22	0.91	0.0139
FEO	1.17	1.06	0.0163
MNO	0.18	0.17	0.0025
MGO	0.66	1.07	0.0164
CAO	4.49	5.24	0.0801
NA2O	5.11	5.39	0.0824
K2O	3.98	2.76	0.0423
H2O+	0.87	3.16	0.0483
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.87		
LESS O	0.00		
TOTAL	99.87		

	ATOMS		
SI	56.576	QTZ	9.29
TI	0.291	C	0.00
AL	18.841	ZR	0.00
FE3	1.503	OR	23.52
FE2	0.380	AB	43.24
MN	0.137	AN	13.80
MG	0.895	LC	0.00
CA	4.328	NE	0.00
NA	8.911	NP	0.00
K	4.568	HL	0.00
OH	5.220	TH	0.00
	0.000	NC	0.00
P	0.069	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	3.55
CR	0.000	WO	1.39
V	0.000	HY	0.00
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	3.11
SR	0.000	CM	0.00
F	0.000	HM	0.07
CL	0.000	IL	0.82
S	0.000	SPH	0.00
LI	0.000	PF	0.00
RB	0.000	RU	0.00
C	160.000	AP	0.00
		HAP	0.21
		FL	0.00
		PY	0.00
		CC	0.00
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	0.87
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	99.87
		FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	29.20	28.27
AB+NE	53.67	55.14
AN	17.13	16.59
QTZ	51.63	72.38
NE	30.80	18.26
KP	17.59	9.36
CAO+BAO+SRO	33.06	39.10
NA2O	37.63	40.26
K2O+RB2O	29.31	20.64
MGO	5.04	8.72
ALK+RB2O	69.40	56.44
FE AS FEO	25.56	24.84
FE2/FE2+FE3	40.33	40.37

OR+AB+AN	80.56
NE+LC+KP	0.00
AC+DI+HY*	4.24
OL+CS	0.00
MT+CM+HM	3.18
IL+SPH**	0.82
DIFF.IND.	76.05
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.715

****CY10 **** #60152

	WT.PC	MOL.PC	MOL.PR
SIO2	68.90	72.66	1.1465
TIO2	0.40	0.32	0.0050
AL2O3	18.12	11.25	0.1777
FE2O3	1.30	0.71	0.0113
FEO	0.19	0.17	0.0026
MNO	0.00	0.00	0.0000
MGO	0.14	0.22	0.0035
CAO	1.27	1.44	0.0225
NA2O	4.72	4.32	0.0761
K2O	3.84	2.58	0.0408
H2O+	1.65	5.60	0.0916
H2O-	0.00	0.00	0.0000
P2O5	0.03	0.01	0.0002
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.06		
LESS O	0.00		
TOTAL	101.06		

	ATOMS		
SI	59.017	QTZ	23.90
TI	0.258	C	3.96
AL	18.296	ZR	0.00
FE3	1.160	OR	22.79
FE2	0.136	AB	39.94
MN	0.000	AN	6.10
MG	0.179	LC	0.00
CA	1.156	NE	0.00
NA	7.838	KP	0.50
K	4.197	HL	0.00
OH	9.429	TH	0.00
	0.000	NC	0.00
P	0.022	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	0.00
CR	0.000	WO	0.00
V	0.000	HY	0.35
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	0.00
SR	0.000	CM	0.00
F	0.000	HM	1.80
CL	0.000	IL	0.40
S	0.000	SPH	0.00
LI	0.000	PF	0.00
RB	0.000	RU	0.19
O	160.000	AP	0.00
		HAP	0.07
		FL	0.00
		PY	0.00
		CC	0.00
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	1.65
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	101.06
		FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	53.02	31.88
AB+NE	38.13	59.54
AN	8.84	8.58
QTZ	60.10	78.73
NE	25.00	13.85
KP	14.90	7.42
CAO+BAO+SRO	12.92	16.23
NA2O	48.02	54.56
K2O+RB2O	39.06	29.21
MGO	1.35	2.39
ALK+RB2O	91.45	80.31
FE AS FEO	17.22	17.30
FE2/FE2+FE3	10.50	10.50

OR+AB+AN	68.74
NE+LC+KP	0.00
AC+DI+HY*	0.35
OL+CS	0.00
MT+CM+HM	1.80
IL+SPH**	0.59
DIFF.IND.	86.33
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.658

****CY11 **** #60153

	WT.PC	MOL.PC	MOL.PR
SIO2	64.26	61.30	1.0693
TIO2	0.58	0.39	0.0048
AL2O3	16.82	9.35	0.1650
FE2O3	1.57	0.57	0.0098
FEO	1.74	1.40	0.0242
MNO	0.12	0.10	0.0017
MGO	0.93	1.33	0.0141
CAO	4.13	4.26	0.0746
NA2O	4.20	3.92	0.0677
K2O	1.98	1.19	0.0327
H2O+	4.73	15.17	0.2625
H2O-	0.00	0.00	0.0000
P2O5	0.10	0.04	0.0007
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.36		
LESSO	0.00		
TOTAL	101.36		

ATOMS		
SI	54.199	
TI	0.241	
AL	16.763	
FE3	0.957	
FE2	1.227	
MN	0.096	
MG	0.919	
CA	3.793	
NA	6.868	
K	3.315	
H	26.615	
TH	0.000	
NC	0.000	
AC	0.000	
P	0.071	
C	0.000	
NS	0.000	
KS	0.000	
DI	0.000	
WO	0.000	
HY	0.000	
GL	0.000	
CS	0.000	
MT	0.000	
CM	0.000	
HM	0.000	
IL	0.000	
SPH	0.000	
PF	0.000	
RU	0.000	
AP	0.000	
HAP	0.000	
FL	0.000	
PY	0.000	
CC	0.000	
MAGN	0.000	
CHALY	0.000	
SPOD	0.000	
H2O+	4.730	
H2O-	0.000	
OTHERS	0.000	
SI.DEF.	0.000	
TOTAL	101.660	
FE/FE+MG	0.380	
OR+AB+AN	71.690	
NE+LC+KP	0.000	
AC+DI+HY*	4.100	
OL+CS	0.000	
MT+CM+HM	2.280	
IL+SPH**	0.720	
DIFF.IND.	71.850	
SI UNSAT.	0.000	
C	160.000	

CIPW NORM	
QTZ	18.11
C	0.00
ZR	0.00
OR	18.20
AB	35.54
AN	17.95
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.55
WO	0.00
HY	2.55
GL	0.00
CS	0.00
MT	2.28
CM	0.00
HM	0.00
IL	0.72
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.24
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	4.73
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.66
FE/FE+MG	0.38
OR+AB+AN	71.69
NE+LC+KP	0.00
AC+DI+HY*	4.10
OL+CS	0.00
MT+CM+HM	2.28
IL+SPH**	0.72
DIFF.IND.	71.85
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	25.39	24.64
AB+NE	49.57	51.05
AN	25.04	24.31
QTZ	58.81	77.78
NE	26.79	14.99
KP	14.40	7.23
CAO+BAO+SRO	36.20	42.30
NA2O	36.81	38.92
K2O+R2O	26.99	18.78
MGO	6.47	11.03
ALK+R2O	64.52	61.20
FE AS FEO	29.01	27.77
FE2/FE2+FE3	56.83	56.85

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.608

****CY13 **** #60154

	WT.PC	MOL.PC	MOL.PR
SIO2	56.63	60.45	0.9424
TIO2	0.66	0.53	0.0083
AL2O3	17.45	10.98	0.1711
FE2O3	4.45	1.79	0.0279
FEO	1.10	0.98	0.0153
MNO	0.16	0.14	0.0023
MGO	0.85	1.35	0.0211
CAO	2.43	2.78	0.0433
NA2O	4.49	4.65	0.0724
K2O	9.06	5.49	0.0856
H2O+	3.03	10.79	0.1682
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.47		
LESSO	0.00		
TOTAL	99.47		

ATOMS		
SI	51.777	
TI	0.454	
AL	18.807	
FE3	3.062	
FE2	0.841	
MN	0.124	
MG	1.188	
CA	3.381	
NA	7.959	
K	9.403	
H	18.482	
P	0.124	
C	0.000	
ZR	0.000	
CR	0.000	
V	0.000	
NI	0.000	
CO	0.000	
BA	0.000	
SR	0.000	
F	0.000	
CL	0.000	
S	0.000	
LI	0.000	
RB	0.000	
C	160.000	

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	47.64
AB	27.57
AN	5.66
LC	0.00
NE	5.54
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	4.57
WO	0.62
HY	0.00
GL	0.00
CS	0.00
MT	2.15
CM	0.00
HM	2.96
IL	1.25
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.38
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	3.02
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.47
FE/FE+MG	0.00
OR+AB+AN	78.87
NE+LC+KP	5.54
AC+DI+HY*	5.19
OL+CS	0.00
MT+CM+HM	5.12
IL+SPH**	1.25
DIFF.IND.	89.65
SI UNSAT.	4.77

RATIOS	WT.PC	MOL.PC
OR+LC+KP	56.37	52.00
AB+NE	39.30	44.01
AN	4.33	4.00
QTZ	41.07	63.62
NE	25.45	16.68
KP	33.43	19.70
CAO+BAO+SRO	16.22	21.52
NA2O	29.97	35.97
K2O+R2O	53.81	42.50
MGO	4.55	8.35
ALK+R2O	67.24	62.60
FE AS FEO	28.20	29.04
FE2/FE2+FE3	23.94	23.97

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.923

****CY14 **** #60155

	WT.PC	MOL.PC	MOL.PR
SIO2	69.62	72.21	1.1419
TIO2	0.34	0.27	0.0043
AL2O3	13.22	11.30	0.1787
FE2O3	0.83	0.33	0.0052
FEO	0.04	0.04	0.0006
MNO	0.00	0.00	0.0000
MGO	0.09	0.14	0.0022
CAO	2.08	2.35	0.0371
NA2O	5.15	5.25	0.0831
K2O	4.26	2.36	0.0452
H2O+	1.49	5.23	0.0327
H2O-	0.00	0.00	0.0000
P2O5	0.05	0.02	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.17		
LESSO	0.00		
TOTAL	101.17		

ATOMS		
SI	59.009	
TI	0.220	
AL	18.467	
FE3	0.537	
FE2	0.029	
MN	0.000	
MG	0.115	
CA	1.916	
NA	8.585	
K	4.674	
H	8.547	
P	0.036	
C	0.000	
ZR	0.000	
CR	0.000	
V	0.000	
NI	0.000	
CO	0.000	
BA	0.000	
SR	0.000	
F	0.000	
CL	0.000	
S	0.000	
LI	0.000	
RB	0.000	
C	160.000	

CIPW NORM	
QTZ	17.91
C	1.48
ZR	0.00
OR	25.18
AB	43.57
AN	9.99
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.22
GL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	0.83
IL	0.08
SPH	0.00
PF	0.00
RU	0.30
AP	0.00
HAP	0.12
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.49
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.17
FE/FE+MG	0.00
OR+AB+AN	76.75
NE+LC+KP	0.00
AC+DI+HY*	0.22
OL+CS	0.00
MT+CM+HM	0.83
IL+SPH**	0.38
DIFF.IND.	86.66
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	31.97	30.92
AB+NE	55.33	56.80
AN	12.69	12.23
QTZ	56.25	75.97
NE	27.24	15.56
KP	16.51	8.47
CAO+BAO+SRO	18.10	22.43
NA2O	44.82	59.23
K2O+R2O	37.03	27.35
MGO	0.87	1.54
ALK+R2O	91.43	90.68
FE AS FEO	7.65	7.74
FE2/FE2+FE3	5.03	5.08

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.718

****CY16 **** #60156

	WT.PC	MOL.PC	MOL.PR
SIO2	65.35	72.36	1.1041
TIO2	0.37	0.30	0.0046
AL2O3	19.24	12.32	0.1887
FE2O3	0.59	0.24	0.0037
FEO	0.00	0.00	0.0000
MNO	0.00	0.00	0.0000
MGO	0.00	0.00	0.0000
CAO	2.26	2.53	0.0403
NA2O	4.49	4.73	0.0724
K2O	4.35	3.01	0.0462
H2O+	1.30	4.71	0.0722
H2O-	0.00	0.00	0.0000
P2O5	0.01	0.00	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.96		
LESSO	0.00		
TOTAL	98.96		

ATOMS		
SI	58.378	
TI	0.245	
AL	19.955	
FE3	0.391	
FE2	0.000	
MN	0.000	
MG	0.000	
CA	2.131	
NA	7.659	
K	4.884	
H	7.631	
P	0.007	
C	0.000	
ZR	0.000	
CR	0.000	
V	0.000	
NI	0.000	
CO	0.000	
BA	0.000	
SR	0.000	
F	0.000	
CL	0.000	
S	0.000	
LI	0.000	
RB	0.000	
C	160.000	

CIPW NORM	
QTZ	16.77
C	1.06
ZR	0.00
OR	25.71
AB	37.99
AN	11.15
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.00
GL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	0.59
IL	0.00
SPH	0.00
PF	0.00
RU	0.37
AP	0.00
HAP	0.02
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.30
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.96
FE/FE+MG	0.00
OR+AB+AN	74.85
NE+LC+KP	0.00
AC+DI+HY*	0.00
OL+CS	0.00
MT+CM+HM	0.59
IL+SPH**	0.37
DIFF.IND.	82.47
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	34.35	33.31
AB+NE	50.76	52.24
AN	14.89	14.45
QTZ	57.33	76.83
NE	24.95	14.15
KP	17.72	9.02
CAO+BAO+SRO	20.36	25.36
NA2O	40.45	45.58
K2O+R2O	39.19	29.06
MGO	0.00	0.00
ALK+R2O	94.55	94.64
FE AS FEO	5.67	5.86
FE2/FE2+FE3	0.00	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.627

****CY18 **** #60157

	WT.PC	MOL.PC	MOL.PR
SIO2	62.22	64.25	1.0154
TIO2	0.51	0.40	0.0064
AL2O3	17.05	10.38	0.1672
FE2O3	2.98	1.15	0.0185
FEO	2.31	2.00	0.0322
MNO	0.17	0.15	0.0024
MGO	1.80	2.77	0.0446
CAO	4.41	4.88	0.0786
NA2O	3.81	3.81	0.0615
K2O	3.25	2.14	0.0345
H2O+	2.32	7.49	0.1288
H2O-	0.00	0.00	0.0000
P2O5	0.21	0.09	0.0015
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.01		
LESSO	0.00		
TOTAL	101.01		

	ATOMS
SI	54.663
TI	0.337
AL	17.657
FE3	1.961
FE2	1.857
MN	0.127
MG	2.157
CA	4.152
NA	6.489
K	3.643
CH	13.598
F	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	15.66
C	0.00
ZR	0.00
OR	19.51
AB	32.54
AN	19.35
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.56
WO	0.00
HY	5.50
OL	0.00
CS	0.00
MT	4.28
CM	0.00
HM	0.00
IL	0.97
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.50
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.31
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.01
FE/FE+MG	0.18

RATIOS	WT.PC	MOL.PC
OR+LC+KP	26.95	26.22
AB+NE	45.23	46.70
AN	27.82	27.08
QTZ	57.70	77.04
NE	25.03	14.70
KP	16.27	8.25
CAO+BAO+SRO	39.45	45.04
NA2O	33.22	35.20
K2O+RB2O	28.33	19.76
MGO	12.86	21.05
ALK+RB2O	50.45	45.24
FE AS FEO	36.69	33.71
FE2/FE2+FE3	48.30	48.32

OR+AB+AN	71.27
NE+LC+KP	0.00
AC+DI+HY*	6.05
OL+CS	0.00
MT+CM+HM	4.28
IL+SPH**	0.97
DIFF.IND.	67.09
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.574

****CY19 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	59.95	62.74	0.9909
TIO2	0.38	0.23	0.0036
AL2O3	18.92	11.87	0.1876
FE2O3	2.53	0.93	0.0146
FEO	0.71	0.63	0.0099
MNO	0.15	0.14	0.0021
MGO	0.15	0.24	0.0059
CAO	3.59	4.09	0.0640
NA2O	4.71	4.86	0.0760
K2O	7.98	5.55	0.0837
H2O+	2.52	8.95	0.1399
H2O-	0.00	0.00	0.0000
P2O5	0.02	0.01	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.20		
LESSO	0.00		
TOTAL	100.20		

	ATOMS
SI	53.221
TI	0.181
AL	20.135
FE3	1.583
FE2	0.536
MN	0.115
MG	0.175
CA	3.475
NA	8.244
K	9.078
CH	15.178
F	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	46.57
AB	30.73
AN	7.21
LC	0.00
NE	4.94
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.70
WO	4.00
HY	0.00
OL	0.00
CS	0.00
MT	1.94
CM	0.00
HM	0.99
IL	0.55
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.05
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.52
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.20
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	52.06	48.47
AB+NE	39.67	44.02
AN	8.06	7.51
QTZ	41.57	64.06
NE	26.25	17.11
KP	32.13	19.84
CAO+BAO+SRO	22.19	28.62
NA2O	29.11	33.97
K2O+RB2O	48.70	37.41
MGO	0.83	1.58
ALK+RB2O	80.31	78.24
FE AS FEO	18.86	20.18
FE2/FE2+FE3	29.09	29.13

OR+AB+AN	84.52
NE+LC+KP	4.94
AC+DI+HY*	4.59
OL+CS	0.00
MT+CM+HM	2.93
IL+SPH**	0.55
DIFF.IND.	82.25
SI UNSAT.	4.16

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.860

****CY192 **** #60158

	WT.PC	MOL.PC	MOL.PR
SIO2	59.06	62.52	0.9828
TIO2	0.28	0.22	0.0035
AL2O3	19.51	12.19	0.1913
FE2O3	2.44	0.97	0.0153
FEO	0.71	0.63	0.0099
MNO	0.12	0.11	0.0017
MGO	0.53	0.84	0.0131
CAO	3.29	3.74	0.0587
NA2O	4.90	5.04	0.0790
K2O	7.45	5.04	0.0791
H2O+	2.42	8.56	0.1343
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.80		
LESSO	0.00		
TOTAL	100.80		

	ATOMS
SI	52.918
TI	0.189
AL	20.607
FE3	1.645
FE2	0.532
MN	0.091
MG	0.763
CA	3.159
NA	8.513
K	8.513
CH	14.466
F	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	44.03
AB	32.42
AN	9.24
LC	0.00
NE	4.90
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	2.65
WO	1.18
HY	0.00
OL	0.00
CS	0.00
MT	1.87
CM	0.00
HM	1.15
IL	0.53
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.42
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.80
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	48.61	45.26
AB+NE	41.19	45.23
AN	10.20	9.50
QTZ	41.63	64.05
NE	27.61	17.97
KP	30.76	17.98
CAO+BAO+SRO	21.04	27.06
NA2O	31.33	36.46
K2O+RB2O	47.63	36.48
MGO	3.33	6.16
ALK+RB2O	77.63	74.10
FE AS FEO	19.02	19.74
FE2/FE2+FE3	27.43	27.47

OR+AB+AN	85.69
NE+LC+KP	4.90
AC+DI+HY*	4.03
OL+CS	0.00
MT+CM+HM	3.02
IL+SPH**	0.53
DIFF.IND.	81.35
SI UNSAT.	4.14

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.826

****CY21 **** #60159

	WT.PC	MOL.PC	MOL.PR
SIO2	66.49	69.36	1.1064
TIO2	0.57	0.45	0.0071
AL2O3	13.85	8.54	0.1353
FE2O3	2.03	0.80	0.0127
FEO	1.79	1.57	0.0249
MNO	0.07	0.06	0.0010
MGO	2.34	3.58	0.0550
CAO	3.63	4.14	0.0636
NA2O	3.78	3.35	0.0610
K2O	5.23	3.51	0.0555
H2O+	0.98	3.43	0.0544
H2O-	0.00	0.00	0.0000
P2O5	0.15	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.97		
LESSO	0.00		
TOTAL	100.97		

	ATOMS
SI	59.032
TI	0.331
AL	14.495
FE3	1.356
FE2	1.329
MN	0.053
MG	3.096
CA	3.501
NA	6.506
K	5.925
OH	5.305
F	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	15.75
C	0.00
ZR	0.00
OR	30.91
AB	31.94
AN	5.33
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	9.34
WO	0.00
HY	2.23
OL	0.00
CS	0.00
MT	2.94
CM	0.00
HM	0.00
IL	1.03
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.35
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.97
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.97
FE/FE+MG	0.39

RATIOS	WT.PC	MOL.PC
OR+LC+KP	45.23	44.01
AB+NE	46.84	48.33
AN	7.83	7.66
QTZ	55.64	75.76
NE	22.03	12.69
KP	22.33	11.55
CAO+BAO+SRO	29.03	36.03
NA2O	29.72	33.48
K2O+RB2O	41.21	30.49
MGO	15.55	25.70
ALK+RB2O	59.92	51.59
FE AS FEO	24.52	22.72
FE2/FE2+FE3	50.45	50.46

OR+AB+AN	68.27
NE+LC+KP	0.00
AC+DI+HY*	11.57
OL+CS	0.00
MT+CM+HM	2.94
IL+SPH**	1.09
DIFF.IND.	79.65
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.858

****CY22WR **** #60160

	WT.PC	MOL.PC	MOL.PR
SIO2	61.48	66.57	1.0330
TIO2	0.74	0.60	0.0093
AL2O3	14.08	8.99	0.1381
FE2O3	2.79	1.14	0.0175
FEO	1.67	1.51	0.0232
MNO	0.09	0.08	0.0013
MGO	2.61	4.21	0.0647
CAO	5.54	5.29	0.0810
NA2O	2.95	3.10	0.0476
K2O	7.88	5.44	0.0837
H2O+	0.83	3.00	0.0461
H2O-	0.00	0.00	0.0000
P2O5	0.19	0.09	0.0013
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.55		
LESSO	0.00		
TOTAL	99.85		

	ATOMS
SI	56.637
TI	0.514
AL	15.514
FE3	1.937
FE2	1.289
MN	0.070
MG	3.589
CA	4.489
NA	5.277
K	9.273
LH	5.109
P	0.143
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
LL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	63.42	62.12
AB+NE	33.99	35.34
AN	2.59	2.54
QTZ	47.93	70.00
NE	17.61	10.88
KP	34.45	19.12
CAO+BAO+SRO	29.54	38.15
NA2O	19.19	22.42
K2O+RB2O	51.27	39.42
MGO	14.74	25.34
ALK+RB2O	61.15	51.38
FE AS FEO	24.11	23.28
FE2/FE2+FE3	41.21	41.23

CIPW NORM	
QTZ	5.26
C	0.00
ZR	0.00
OR	46.57
AB	24.96
AN	1.91
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	14.32
WO	0.57
HY	0.00
OL	0.00
CS	0.00
MT	3.53
CM	0.00
HM	0.35
IL	1.41
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.45
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.82
H2O-	0.00
OTHERS	0.00
SI-DEF.	0.00
TOTAL	99.85
FE/FE+MG	0.00
OR+AB+AN	73.44
NE+LC+KP	0.00
AC+DI+HY*	14.59
OL+CS	0.00
MT+CM+HM	3.88
IL+SPH**	1.41
DIFF.IND.	76.79
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.816

****CY23 **** #60161

	WT.PC	MOL.PC	MOL.PR
SIO2	60.06	68.21	0.9994
TIO2	0.65	0.56	0.0081
AL2O3	17.50	11.71	0.1716
FE2O3	2.47	1.06	0.0155
FEO	3.03	1.93	0.0283
MNO	0.08	0.08	0.0011
MGO	0.66	1.12	0.0164
CAO	3.65	3.23	0.0473
NA2O	3.30	3.63	0.0532
K2O	4.18	5.93	0.0868
H2O+	0.65	2.46	0.0361
H2O-	0.00	0.00	0.0000
P2O5	0.19	0.09	0.0013
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.42		
LESSO	0.00		
TOTAL	98.42		

	ATOMS
SI	56.063
TI	0.482
AL	19.256
FE3	1.735
FE2	1.585
MN	0.063
MG	0.918
CA	2.651
NA	5.972
K	9.743
LH	4.048
P	0.150
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	56.85	55.72
AB+NE	32.83	34.15
AN	10.32	10.13
QTZ	46.77	68.97
NE	18.90	11.79
KP	34.33	19.24
CAO+BAO+SRO	13.75	25.23
NA2O	23.35	28.42
K2O+RB2O	57.89	46.36
MGO	4.01	7.55
ALK+RB2O	69.69	64.62
FE AS FEO	26.30	27.83
FE2/FE2+FE3	48.70	48.71

CIPW NORM	
QTZ	1.75
C	0.00
ZR	0.00
OR	48.55
AB	27.92
AN	8.78
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	2.52
WO	0.00
HY	1.19
OL	0.00
CS	0.00
MT	3.58
CM	0.00
HM	0.00
IL	1.63
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.45
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.64
H2O-	0.00
OTHERS	0.00
SI-DEF.	0.00
TOTAL	98.52
FE/FE+MG	0.26
OR+AB+AN	85.25
NE+LC+KP	0.00
AC+DI+HY*	3.71
OL+CS	0.00
MT+CM+HM	3.58
IL+SPH**	1.23
DIFF.IND.	80.62
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****CY25 **** #60162

	WT.PC	MOL.PC	MOL.PR
SIO2	60.79	63.13	1.0116
TIO2	0.49	0.38	0.0061
AL2O3	16.51	10.10	0.1619
FE2O3	2.44	0.95	0.0153
FEO	2.04	1.77	0.0246
MNO	0.13	0.16	0.0025
MGO	1.69	2.62	0.0419
CAO	4.32	4.31	0.0770
NA2O	4.54	4.57	0.0732
K2O	4.09	2.71	0.0434
H2O+	2.51	5.69	0.1393
H2O-	0.00	0.00	0.0000
P2O5	0.24	0.11	0.0017
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.34		
LESSO	0.00		
TOTAL	99.84		

	ATOMS
SI	54.638
TI	0.329
AL	17.330
FE3	1.640
FE2	1.524
MN	0.136
MG	2.249
CA	4.134
NA	7.850
K	4.661
OH	14.954
P	0.181
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	32.13	31.17
AB+NE	51.09	52.59
AN	16.75	16.25
QTZ	51.49	72.34
NE	29.22	17.36
KP	19.29	10.30
CAO+BAO+SRO	33.36	39.77
NA2O	35.05	37.81
K2O+RB2O	31.53	22.42
MGO	11.47	19.05
ALK+RB2O	58.57	55.01
FE AS FEO	29.97	27.94
FE2/FE2+FE3	50.24	50.30

CIPW NORM	
QTZ	8.63
C	0.00
ZR	0.00
OR	24.17
AB	38.41
AN	12.60
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	5.31
WO	0.00
HY	2.69
OL	0.00
CS	0.00
MT	3.54
CM	0.00
HM	0.00
IL	0.93
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.57
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.50
H2O-	0.00
OTHERS	0.00
SI-DEF.	0.00
TOTAL	99.84
FE/FE+MG	0.19
OR+AB+AN	75.18
NE+LC+KP	0.00
AC+DI+HY*	8.50
OL+CS	0.00
MT+CM+HM	3.54
IL+SPH**	0.93
DIFF.IND.	71.21
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.720

****CY26 **** #60263

	WT.PC	MOL.PC	MOL.PR
SIO2	52.93	72.07	1.0480
TIO2	0.21	0.19	0.0026
AL2O3	13.43	12.43	0.1808
FE2O3	2.14	0.92	0.0134
FEO	0.14	0.17	0.0025
MNO	0.03	0.03	0.0011
MGO	0.01	0.02	0.0002
CAO	1.66	2.04	0.0295
NA2O	5.13	5.39	0.0827
K2O	7.15	5.22	0.0759
H2O+	0.31	1.13	0.0172
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.23		
LESSO	0.00		
TOTAL	98.23		

	ATOMS
SI	57.958
TI	0.145
AL	19.593
FE3	1.432
FE2	0.139
MN	0.052
MG	0.014
CA	1.637
NA	9.153
K	8.196
OH	1.603
P	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	46.03	44.73
AB+NE	47.27	48.76
AN	6.70	6.51
QTZ	46.19	68.14
NE	26.62	16.62
KP	27.19	15.24
CAO+BAO+SRO	11.91	15.72
NA2O	36.80	43.96
K2O+RB2O	51.27	40.32
MGO	0.07	0.13
ALK+RB2O	84.85	83.39
FE AS FEO	15.10	16.07
FE2/FE2+FE3	11.90	11.94

CIPW NORM	
QTZ	2.65
C	0.00
ZR	0.00
OR	42.25
AB	43.40
AN	6.15
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.05
WO	0.34
HY	0.00
OL	0.00
CS	0.00
MT	0.23
CM	0.00
HM	1.98
IL	0.40
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.31
H2O-	0.00
OTHERS	0.00
SI-DEF.	0.00
TOTAL	98.24
FE/FE+MG	0.00
OR+AB+AN	91.81
NE+LC+KP	0.00
AC+DI+HY*	0.90
OL+CS	0.00
MT+CM+HM	2.21
IL+SPH**	0.40
DIFF.IND.	88.32
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.877

****CY27 **** #60164

	WT.PC	MOL.PC	MOL.PR
SIO2	62.22	72.19	1.0136
TIO2	0.55	0.50	0.0039
AL2O3	18.27	12.53	0.1792
FE2O3	2.52	1.10	0.0158
FEO	0.14	0.14	0.0019
MNO	0.05	0.05	0.0007
MGO	0.13	0.23	0.0032
CAO	0.11	0.14	0.0020
NA2O	2.51	2.79	0.0356
K2O	10.96	8.14	0.1164
H2O+	0.67	2.60	0.0372
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	97.51		
LESSO	0.00		
TOTAL	97.51		

	ATOMS
SI	57.954
TI	0.161
AL	20.060
FE3	1.767
FE2	0.109
MN	0.039
MG	0.180
CA	0.110
NA	3.991
K	13.026
OH	4.163
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	6.98
C	2.57
ZR	0.00
OR	64.78
AB	18.70
AN	0.55
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.32
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	2.52
IL	0.40
SPH	0.00
PF	0.00
RU	0.02
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.67
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	97.51
FE/FE+MG	0.00
OR+AB+AN	84.02
NE+LC+KP	0.00
AC+DI+HY*	0.32
OL+CS	0.00
MT+CM+HM	2.52
IL+SPH**	0.42
DIFF.IND.	90.46
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	77.10	76.06
AB+NE	22.25	23.30
AN	0.65	0.64
QTZ	48.11	70.43
NE	11.20	6.93
KP	40.69	22.63
CAO+BAO+SRO	0.83	1.27
NA2O	16.64	23.15
K2O+RB2O	82.53	75.57
MGO	0.83	1.70
ALK+RB2O	83.58	80.24
FE AS FEO	15.60	18.06
FE2/FE2+FE3	7.73	7.76

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.848

****CY23 **** #60165

	WT.PC	MOL.PC	MOL.PR
SIO2	67.89	76.10	1.1277
TIO2	0.13	0.11	0.0016
AL2O3	15.83	10.46	0.1553
FE2O3	1.27	0.54	0.0080
FEO	0.44	0.41	0.0061
MNO	0.01	0.01	0.0001
MGO	0.05	0.09	0.0012
CAO	0.53	0.64	0.0095
NA2O	3.14	3.41	0.0507
K2O	8.60	6.15	0.0915
H2O+	0.56	2.09	0.0311
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.45		
LESSO	0.00		
TOTAL	98.45		

	ATOMS
SI	61.433
TI	0.038
AL	16.436
FE3	0.865
FE2	0.333
MN	0.008
MG	0.057
CA	0.514
NA	5.509
K	2.930
OH	5.381
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	15.50
C	0.33
ZR	0.00
OR	50.85
AB	26.57
AN	2.63
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.12
OL	0.00
CS	0.00
MT	1.07
CM	0.00
HM	0.53
IL	0.25
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.56
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.45
FE/FE+MG	0.00
OR+AB+AN	80.03
NE+LC+KP	0.00
AC+DI+HY*	0.12
OL+CS	0.00
MT+CM+HM	1.60
IL+SPH**	0.25
DIFF.IND.	92.89
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	53.52	62.25
AB+NE	33.20	34.53
AN	3.29	3.22
QTZ	53.41	74.41
NE	15.49	9.13
KP	31.09	16.46
CAO+BAO+SRO	4.32	6.24
NA2O	25.59	33.45
K2O+RB2O	70.09	60.30
MGO	0.37	0.75
ALK+RB2O	87.72	85.84
FE AS FEO	11.90	13.41
FE2/FE2+FE3	28.25	28.26

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.914

****CY29 **** #60166

	WT.PC	MOL.PC	MOL.PR
SIO2	53.30	59.41	0.8369
TIO2	1.01	0.85	0.0125
AL2O3	18.25	11.99	0.1790
FE2O3	4.61	1.93	0.0289
FEO	1.90	1.77	0.0264
MNO	0.18	0.17	0.0025
MGO	0.95	1.59	0.0236
CAO	5.42	6.47	0.0966
NA2O	3.32	3.59	0.0536
K2O	8.77	6.24	0.0931
H2O+	1.59	5.91	0.0363
H2O-	0.00	0.00	0.0000
P2O5	0.20	0.09	0.0014
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.50		
LESSO	0.00		
TOTAL	99.50		

	ATOMS
SI	59.432
TI	0.719
AL	29.355
FE3	3.283
FE2	1.504
MN	0.144
MG	1.340
CA	5.496
NA	6.090
K	10.586
OH	10.037
P	0.160
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	51.34
AB	9.62
AN	9.00
LC	0.00
NE	10.01
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	5.10
WO	4.19
HY	0.00
OL	0.00
CS	0.00
MT	3.78
CM	0.00
HM	2.00
IL	1.92
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.47
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.58
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.50
FE/FE+MG	0.00
OR+AB+AN	70.45
NE+LC+KP	10.01
AC+DI+HY*	9.29
OL+CS	0.00
MT+CM+HM	5.74
IL+SPH**	1.92
DIFF.IND.	71.46
SI UNSAT.	8.47

RATIOS	WT.PC	MOL.PC
OR+LC+KP	64.43	57.13
AB+NE	24.39	32.39
AN	11.13	9.93
QTZ	37.49	60.31
NE	21.27	14.49
KP	41.22	25.20
CAO+BAO+SRO	30.93	39.72
NA2O	18.96	22.01
K2O+RB2O	50.09	38.27
MGO	4.95	9.17
ALK+RB2O	62.73	57.09
FE AS FEO	32.32	33.75
FE2/FE2+FE3	33.40	33.42

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.820

****CY30 **** #60167

	WT.PC	MOL.PC	MOL.PR
SIO2	67.77	66.93	1.1277
TIO2	0.14	0.10	0.0013
AL2O3	15.71	9.15	0.1541
FE2O3	1.90	0.71	0.0119
FEO	0.11	0.09	0.0015
MNO	0.30	0.25	0.0042
MGO	0.18	0.26	0.0045
CAO	1.31	1.39	0.0234
NA2O	3.83	3.67	0.0618
K2O	7.62	4.80	0.0809
H2O+	3.84	12.65	0.2131
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.71		
LESSO	0.00		
TOTAL	102.71		

	ATOMS
SI	57.349
TI	0.089
AL	15.671
FE3	1.210
FE2	0.076
MN	0.215
MG	0.227
CA	1.138
NA	6.284
K	8.228
OH	21.678
P	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	13.97
C	0.00
ZR	0.00
OR	45.04
AB	32.41
AN	3.17
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.97
WO	0.87
HY	0.00
OL	0.00
CS	0.00
MT	0.93
CM	0.00
HM	1.26
IL	0.26
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	3.84
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.71
FE/FE+MG	0.00
OR+AB+AN	80.62
NE+LC+KP	0.00
AC+DI+HY*	1.84
OL+CS	0.00
MT+CM+HM	2.19
IL+SPH**	0.26
DIFF.IND.	91.41
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	55.67	54.52
AB+NE	40.20	41.64
AN	3.93	3.84
QTZ	52.93	73.73
NE	19.20	11.35
KP	28.00	14.86
CAO+BAO+SRO	10.27	14.07
NA2O	30.02	37.21
K2O+RB2O	59.72	48.72
MGO	1.31	2.53
ALK+RB2O	83.23	80.75
FE AS FEO	15.42	16.73
FE2/FE2+FE3	19.34	19.49

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.926

****CY31 **** #60168

	WT.PC	MOL.PC	MOL.PR
SIO2	53.97	76.12	1.0578
TIO2	0.31	0.33	0.0033
AL2O3	17.47	11.79	0.1718
FE2O3	1.41	0.91	0.0057
FEO	0.16	0.19	0.0026
MNO	0.06	0.06	0.0008
MGO	0.33	0.35	0.0087
CAO	1.36	1.67	0.0243
NA2O	2.15	2.59	0.0347
K2O	11.26	10.23	0.1195
H2O+	0.93	1.45	0.0211
H2O-	0.00	0.00	0.0000
P2O5	0.14	0.08	0.0003
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.50		
LESS O	0.00		
TOTAL	99.50		

	ATOMS
SI	58.547
TI	0.270
AL	19.653
FE3	0.942
FE2	0.172
MN	0.067
MG	0.455
CA	1.349
NA	3.259
K	15.100
OH	3.347
P	0.071
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	74.36	73.44
AB+NE	20.32	21.30
AN	5.32	5.26
QTZ	46.90	69.44
NE	10.93	6.87
KP	42.12	23.69
CAO+BAO+SRO	9.21	13.59
NA2O	14.56	19.43
K2O+RB2O	75.24	66.98
MGO	2.17	4.47
ALK+RB2O	88.06	84.21
FE AS FEO	9.73	11.32
FE2/FE2+FE3	14.74	14.82

CIPW NORM

QTZ	5.04
C	0.00
ZR	0.00
OR	66.55
AB	18.19
AN	4.76
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.17
WO	0.00
HY	0.23
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	1.41
IL	0.47
SPH	0.16
PF	0.00
RU	0.00
AP	0.00
HAP	0.09
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.33
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.50
FE/FE+MG	0.00
OR+AB+AN	89.51
NE+LC+KP	0.00
AC+DI+HY*	1.45
OL+CS	0.00
MT+CM+HM	1.41
IL+SPH**	0.62
DIFF.IND.	89.78
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.900

****CY32 **** #60169

	WT.PC	MOL.PC	MOL.PR
SIO2	52.44	72.36	1.0390
TIO2	0.25	0.22	0.0031
AL2O3	17.90	12.26	0.1756
FE2O3	3.09	1.55	0.0193
FEO	0.20	0.19	0.0028
MNO	0.05	0.05	0.0006
MGO	0.01	0.02	0.0002
CAO	0.43	0.56	0.0077
NA2O	3.42	3.35	0.0532
K2O	9.24	6.35	0.0831
H2O+	0.53	2.43	0.0305
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	97.56		
LESS O	0.00		
TOTAL	97.56		

	ATOMS
SI	58.697
TI	0.195
AL	19.616
FE3	2.152
FE2	0.156
MN	0.024
MG	0.014
CA	0.458
NA	6.164
K	10.951
OH	5.411
P	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	63.74	62.44
AB+NE	33.77	35.12
AN	2.49	2.44
QTZ	47.98	70.05
NE	17.46	10.73
KP	34.56	19.17
CAO+BAO+SRO	3.28	4.76
NA2O	26.13	34.23
K2O+RB2O	70.59	60.96
MGO	0.05	0.13
ALK+RB2O	80.74	78.43
FE AS FEO	19.20	21.44
FE2/FE2+FE3	7.64	7.65

CIPW NORM

QTZ	6.24
C	1.63
ZR	0.00
OR	54.61
AB	28.94
AN	2.13
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.02
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	3.03
IL	0.47
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.35
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	97.56
FE/FE+MG	0.00
OR+AB+AN	65.68
NE+LC+KP	0.00
AC+DI+HY*	0.02
OL+CS	0.00
MT+CM+HM	3.10
IL+SPH**	0.47
DIFF.IND.	89.79
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.873

****CY333 **** #60170

	WT.PC	MOL.PC	MOL.PR
SIO2	55.30	61.36	0.9202
TIO2	1.23	1.03	0.0156
AL2O3	15.26	10.01	0.1497
FE2O3	5.72	2.99	0.0353
FEO	1.79	1.67	0.0249
MNO	0.12	0.11	0.0017
MGO	2.27	3.77	0.0563
CAO	6.41	7.65	0.1145
NA2O	2.31	2.49	0.0373
K2O	7.00	4.97	0.0743
H2O+	1.11	4.12	0.0616
H2O-	0.00	0.00	0.0000
P2O5	0.48	0.25	0.0034
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.00		
LESS O	0.00		
TOTAL	99.00		

	ATOMS
SI	52.304
TI	0.835
AL	17.014
FE3	4.072
FE2	1.436
MN	0.096
MG	3.009
CA	6.437
NA	4.236
K	3.448
OH	7.004
P	0.384
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	57.85	56.89
AB+NE	27.33	28.53
AN	14.82	14.58
QTZ	46.85	69.13
NE	16.51	10.31
KP	36.66	20.56
CAO+BAO+SRO	40.73	50.60
NA2O	14.69	16.50
K2O+RB2O	44.55	32.90
MGO	12.14	21.15
ALK+RB2O	49.93	41.93
FE AS FEO	37.87	36.92
FE2/FE2+FE3	27.07	27.08

CIPW NORM

QTZ	3.20
C	0.00
ZR	0.00
OR	41.37
AB	19.54
AN	10.50
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	12.19
WO	1.00
HY	0.00
OL	0.00
CS	0.00
MT	2.63
CM	0.00
HM	3.93
IL	2.34
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	1.13
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.09
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.00
FE/FE+MG	0.00
OR+AB+AN	71.52
NE+LC+KP	0.00
AC+DI+HY*	13.20
OL+CS	0.00
MT+CM+HM	6.52
IL+SPH**	2.34
DIFF.IND.	64.12
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.745

****CY34 **** #60171

	WT.PC	MOL.PC	MOL.PR
SIO2	53.41	58.34	0.8893
TIO2	0.96	0.79	0.0120
AL2O3	17.96	11.56	0.1761
FE2O3	4.52	1.85	0.0283
FEO	2.76	2.52	0.0384
MNO	0.22	0.20	0.0031
MGO	1.40	2.28	0.0347
CAO	5.90	6.91	0.1052
NA2O	4.14	4.33	0.0668
K2O	8.16	5.69	0.0366
H2O+	1.46	5.52	0.0313
H2O-	0.00	0.00	0.0000
P2O5	0.31	0.14	0.0022
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.20		
LESS O	0.00		
TOTAL	101.20		

	ATOMS
SI	50.041
TI	0.676
AL	19.836
FE3	3.187
FE2	2.153
MN	0.175
MG	1.955
CA	5.924
NA	7.520
K	9.755
OH	9.126
P	0.246
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	61.62	52.57
AB+NE	30.30	40.53
AN	8.03	6.90
QTZ	35.55	58.09
NE	26.33	16.24
KP	38.09	23.66
CAO+BAO+SRO	32.42	40.68
NA2O	22.75	25.82
K2O+RB2O	44.84	33.50
MGO	6.75	12.13
ALK+RB2O	59.23	53.57
FE AS FEO	33.97	34.24
FE2/FE2+FE3	42.23	42.31

CIPW NORM

QTZ	0.00
C	0.00
ZR	0.00
OR	48.23
AB	10.34
AN	6.33
LC	0.00
NE	13.38
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	7.82
WO	4.56
HY	0.00
OL	0.00
CS	0.00
MT	6.55
CM	0.00
HM	0.00
IL	1.82
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.73
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.45
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.20
FE/FE+MG	0.00
OR+AB+AN	64.89
NE+LC+KP	13.38
AC+DI+HY*	12.34
OL+CS	0.00
MT+CM+HM	6.55
IL+SPH**	1.82
DIFF.IND.	71.94
SI UNSAT.	11.32

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.871

****CY35 **** #60172

	WT.PC	MOL.PC	MOL.PR
SIO2	62.04	71.21	1.0324
TIO2	0.39	0.34	0.0049
AL2O3	16.30	11.03	0.1599
FE2O3	2.39	1.03	0.0150
FEO	0.82	0.79	0.0114
MNO	0.07	0.07	0.0010
MGO	0.67	1.15	0.0166
CAO	2.31	2.72	0.0394
NA2O	1.91	1.98	0.0278
K2O	10.73	7.56	0.1139
H2O+	0.49	1.88	0.0272
H2O-	0.00	0.00	0.0000
P2O5	0.08	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	97.90		
LESSO	0.00		
TOTAL	97.90		

	ATOMS
SI	58.183
TI	0.275
AL	18.020
FE3	1.687
FE2	0.643
AR	0.000
MN	0.056
MG	0.937
CA	2.221
NA	1.809
K	12.940
LH	5.066
	0.000
	0.000
P	0.054
C	0.000
NS	0.000
KS	0.000
ZR	0.000
DI	0.000
CR	0.000
WO	0.000
V	0.000
HY	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
CM	0.000
HM	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	6.66
C	0.50
ZR	0.00
OR	63.42
AB	14.47
AN	5.11
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	3.60
WO	0.30
HY	0.00
OL	0.00
CS	0.00
MT	1.74
CM	0.00
HM	1.19
IL	0.74
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.19
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.49
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	97.90
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	76.41	75.60
AB+NE	17.43	18.31
AN	6.16	6.09
QTZ	48.11	70.52
NE	9.27	5.75
KP	42.62	23.74
CAO+BAO+SRO	15.09	21.78
NA2O	11.67	15.25
K2O+RB2O	73.24	62.97
MG	4.15	8.29
ALK+RB2O	77.03	70.59
FE AS FEO	18.85	21.12
FE2/FE2+FE3	29.27	29.29

OR+AB+AN	83.00
NE+LC+KP	0.00
AC+DI+HY*	3.69
OL+CS	0.00
MT+CM+HM	2.93
IL+SPH**	0.74
DIFF.IND.	84.55
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.885

****CY36 **** #60173

	WT.PC	MOL.PC	MOL.PR
SIO2	51.23	54.35	0.9525
TIO2	1.09	0.87	0.0152
AL2O3	12.15	7.59	0.1190
FE2O3	4.90	1.96	0.0307
FEO	5.10	4.53	0.0710
MNO	0.23	0.21	0.0033
MGO	5.40	8.54	0.1339
CAO	10.35	11.74	0.1842
NA2O	0.39	0.40	0.0063
K2O	5.80	3.93	0.0616
H2O+	1.52	3.33	0.0444
H2O-	0.00	0.00	0.0000
P2O5	1.15	0.52	0.0082
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.27		
LESSO	0.00		
TOTAL	99.27		

	ATOMS
SI	49.105
TI	0.782
AL	13.761
FE3	3.549
FE2	4.105
MN	0.188
MG	7.746
CA	10.654
NA	0.728
K	7.123
OH	9.759
	0.000
	0.000
P	0.945
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	4.40
C	0.00
ZR	0.00
OR	34.24
AR	3.50
AN	14.22
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	23.54
WO	0.00
HY	6.17
OL	0.00
CS	0.00
MT	7.19
CM	0.00
HM	0.00
IL	2.05
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	2.74
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.47
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.27
FE/FE+MG	0.13

RATIOS	WT.PC	MOL.PC
OR+LC+KP	66.13	65.92
AB+NE	6.37	6.73
AN	27.45	27.35
QTZ	49.35	71.75
NE	4.25	2.62
KP	46.40	25.63
CAO+BAO+SRO	52.53	73.03
NA2O	2.35	2.50
K2O+RB2O	35.11	24.43
MGO	25.32	39.70
ALK+RB2O	29.82	20.12
FE AS FEO	45.86	40.19
FE2/FE2+FE3	54.73	54.74

OR+AB+AN	51.80
NE+LC+KP	0.00
AC+DI+HY*	29.71
OL+CS	0.00
MT+CM+HM	7.19
IL+SPH**	2.05
DIFF.IND.	41.93
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.548

****CY43 **** #60174

	WT.PC	MOL.PC	MOL.PR
SIO2	56.54	63.16	0.9408
TIO2	0.95	0.80	0.0119
AL2O3	17.41	11.46	0.1708
FE2O3	3.65	1.53	0.0229
FEO	3.99	3.73	0.0555
MNO	0.15	0.14	0.0021
MGO	0.86	1.43	0.0213
CAO	3.11	3.72	0.0555
NA2O	1.20	1.30	0.0194
K2O	9.18	6.34	0.0975
H2O+	1.63	6.37	0.0905
H2O-	0.00	0.00	0.0000
P2O5	0.22	0.10	0.0015
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.39		
LESSO	0.00		
TOTAL	98.39		

	ATOMS
SI	53.034
TI	0.671
AL	19.269
FE3	2.579
FE2	3.133
MN	0.119
MG	1.203
CA	3.129
NA	2.154
K	10.998
OH	10.210
	0.000
P	0.175
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	5.72
C	0.37
ZR	0.00
OR	54.26
AB	10.15
AN	13.99
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	5.16
OL	0.00
CS	0.00
MT	5.29
CM	0.00
HM	0.00
IL	1.80
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.52
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.62
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.39
FE/FE+MG	0.52

RATIOS	WT.PC	MOL.PC
OR+LC+KP	69.23	68.65
AB+NE	12.93	13.64
AN	17.85	17.71
QTZ	48.19	70.65
NE	7.84	4.86
KP	43.96	24.49
CAO+BAO+SRO	23.03	32.19
NA2O	8.90	11.24
K2O+RB2O	64.03	56.57
MGO	4.61	8.83
ALK+RB2O	55.61	48.37
FE AS FEO	39.73	42.80
FE2/FE2+FE3	55.76	55.77

OR+AB+AN	78.40
NE+LC+KP	0.00
AC+DI+HY*	5.16
OL+CS	0.00
MT+CM+HM	5.29
IL+SPH**	1.80
DIFF.IND.	70.13
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.684

****CY402 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	58.42	62.59	0.9721
TIO2	0.95	0.77	0.0119
AL2O3	17.87	11.28	0.1753
FE2O3	3.97	1.60	0.0249
FEO	3.99	3.58	0.0555
MNO	0.14	0.13	0.0020
MGO	1.27	2.03	0.0315
CAO	3.15	3.62	0.0562
NA2O	2.47	2.57	0.0398
K2O	8.85	6.05	0.0940
H2O+	1.59	3.58	0.0883
H2O-	0.00	0.00	0.0000
P2O5	0.26	0.12	0.0019
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.93		
LESSO	0.00		
TOTAL	102.93		

	ATOMS
SI	52.819
TI	0.646
AL	19.045
FE3	2.701
FE2	3.017
MN	0.107
MG	1.711
CA	3.052
NA	4.330
K	10.210
OH	9.590
	0.000
P	0.199
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	1.54
C	0.00
ZR	0.00
OR	52.31
AR	20.90
AN	11.54
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.97
WO	0.00
HY	4.93
OL	0.00
CS	0.00
MT	5.76
CM	0.00
HM	0.00
IL	1.60
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.61
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.58
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.93
FE/FE+MG	0.40

RATIOS	WT.PC	MOL.PC
OR+LC+KP	61.73	60.80
AB+NE	24.56	25.78
AN	13.61	13.42
QTZ	45.09	67.69
NE	15.15	9.62
KP	39.77	22.69
CAO+BAO+SRO	21.77	29.57
NA2O	17.07	20.97
K2O+RB2O	61.16	49.46
MG	6.26	11.56
ALK+RB2O	55.73	49.10
FE AS FEO	37.96	39.35
FE2/FE2+FE3	53.62	53.63

OR+AB+AN	84.74
NE+LC+KP	0.00
AC+DI+HY*	6.90
OL+CS	0.00
MT+CM+HM	5.76
IL+SPH**	1.60
DIFF.IND.	74.74
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.763

****CY44 **** #60175

	WT.PC	MOL.PC	MOL.PR
SIO2	56.66	60.18	0.9662
TIO2	0.42	0.19	0.0058
AL2O3	21.81	13.67	0.2139
FE2O3	3.90	1.56	0.0244
FEO	0.95	0.35	0.0132
MNO	0.36	0.12	0.0051
MGO	0.22	0.40	0.0063
CAO	4.66	5.31	0.0931
NA2O	2.48	2.56	0.0400
K2O	7.70	5.23	0.0817
H2O+	2.66	9.23	0.1443
H2O-	0.08	0.00	0.0000
P2O5	0.05	0.02	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.08		
LESS O	0.00		
TOTAL	102.08		

	ATOMS
SI	50.559
TI	0.378
AL	22.961
FE3	2.610
FE2	0.707
MN	0.271
MG	0.531
CA	4.440
NA	4.275
K	8.776
H	15.403
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
OL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
O	160.000

CIPW NORM	
QTZ	2.74
C	1.04
ZR	0.00
OR	45.51
AB	20.96
AN	22.79
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.62
OL	0.00
CS	0.00
MT	2.90
CM	0.00
HM	1.90
IL	0.87
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.12
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.60
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.08
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	50.97	50.24
AB+NE	23.50	24.59
AN	25.53	25.17
QTZ	46.23	68.63
NE	16.42	10.31
KP	37.35	21.07
CAO+BAO+SRC	31.40	40.56
NA2O	16.71	19.53
K2O+RB2O	51.89	39.91
MGO	1.64	3.18
ALK+RB2O	66.76	62.41
FE AS FEO	31.60	34.41
FE2/FE2+FE3	27.18	27.25

OR+AB+AN	89.29
NE+LC+KP	0.00
AC+DI+HY*	0.62
OL+CS	0.00
MT+CM+HM	4.80
IL+SPH**	0.87
DIFF.IND.	69.24
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.569

****CY44CM **** #60176

	WT.PC	MOL.PC	MOL.PR
SIO2	60.26	66.75	1.0027
TIO2	0.81	0.54	0.0081
AL2O3	20.92	13.66	0.2052
FE2O3	2.22	0.93	0.0139
FEO	0.27	0.22	0.0033
MNO	0.04	0.04	0.0006
MGO	0.01	0.02	0.0002
CAO	2.66	3.19	0.0478
NA2O	3.10	3.33	0.0500
K2O	7.88	5.57	0.0337
H2O+	1.60	5.91	0.0888
H2O-	0.00	0.00	0.0000
P2O5	0.05	0.02	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.44		
LESS O	0.00		
TOTAL	99.44		

	ATOMS
SI	54.194
TI	0.273
AL	22.260
FE3	1.508
FE2	0.004
MN	0.031
MG	0.013
CA	2.562
NA	5.425
K	9.075
OH	9.635
P	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	8.45
C	2.52
ZR	0.00
OR	46.57
AB	26.23
AN	12.97
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.02
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	2.22
IL	0.66
SPH	0.00
PF	0.00
RU	0.06
AP	0.00
HAP	0.12
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.60
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.44
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	54.30	53.30
AB+NE	30.53	31.56
AN	15.12	14.85
QTZ	48.68	70.60
NE	17.95	11.00
KP	33.39	18.40
CAO+BAO+SRC	19.62	26.34
NA2O	22.69	27.56
K2O+RB2O	57.69	46.11
MGO	0.03	0.15
ALK+RB2O	82.57	80.50
FE AS FEO	17.35	19.35
FE2/FE2+FE3	13.43	13.45

OR+AB+AN	85.77
NE+LC+KP	0.00
AC+DI+HY*	0.02
OL+CS	0.00
MT+CM+HM	2.22
IL+SPH**	0.72
DIFF.IND.	79.25
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.652

****CY45 **** #60177

	WT.PC	MOL.PC	MOL.PR
SIO2	62.66	68.11	1.0427
TIO2	0.27	0.22	0.0034
AL2O3	19.93	12.77	0.1955
FE2O3	2.57	1.05	0.0161
FEO	0.04	0.04	0.0006
MNO	0.04	0.04	0.0006
MGO	0.00	0.00	0.0000
CAO	0.16	0.21	0.0032
NA2O	4.25	4.48	0.0686
K2O	3.00	5.55	0.0349
H2O+	2.06	7.34	0.1155
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.02		
LESS O	0.00		
TOTAL	100.02		

	ATOMS
SI	55.608
TI	0.180
AL	20.849
FE3	1.717
FE2	0.030
MN	0.030
MG	0.000
CA	0.171
NA	7.312
K	9.059
OH	12.315
P	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	6.93
C	3.95
ZR	0.00
OR	47.28
AB	35.96
AN	0.89
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.00
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	2.57
IL	0.17
SPH	0.00
PF	0.00
RU	0.18
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.08
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.02
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	56.20	54.76
AB+NE	42.74	44.20
AN	1.06	1.03
QTZ	49.60	70.39
NE	21.60	13.23
KP	29.80	16.39
CAO+BAO+SRC	1.45	2.05
NA2O	34.19	43.75
K2O+RB2O	64.36	54.20
MGO	0.00	0.00
ALK+RB2O	83.66	82.17
FE AS FEO	16.34	17.83
FE2/FE2+FE3	3.34	3.36

OR+AB+AN	84.14
NE+LC+KP	0.00
AC+DI+HY*	0.00
OL+CS	0.00
MT+CM+HM	2.57
IL+SPH**	0.35
DIFF.IND.	90.17
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.785

****CY45A **** #60178

	WT.PC	MOL.PC	MOL.PR
SIO2	59.55	66.12	0.9909
TIO2	0.57	0.43	0.0071
AL2O3	18.61	12.13	0.1825
FE2O3	3.99	1.57	0.0250
FEO	1.44	1.34	0.0200
MNO	0.04	0.04	0.0006
MGO	0.59	0.93	0.0146
CAO	3.91	4.65	0.0697
NA2O	5.62	6.05	0.0907
K2O	4.61	3.27	0.0439
H2O+	0.35	3.13	0.0477
H2O-	0.00	0.00	0.0000
P2O5	0.13	0.05	0.0009
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.92		
LESS O	0.00		
TOTAL	99.92		

	ATOMS
SI	54.381
TI	0.391
AL	20.033
FE3	2.742
FE2	1.100
MN	0.031
MG	0.803
CA	3.226
NA	9.550
K	5.372
OH	5.239
P	0.101
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	1.75
C	4.03
ZR	0.00
OR	27.25
AB	47.55
AN	11.94
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	3.17
WO	1.06
HY	0.00
OL	0.00
CS	0.00
MT	3.12
CM	0.00
HM	1.34
IL	1.00
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.51
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.35
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.92
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	31.41	30.39
AB+NE	54.82	56.29
AN	13.77	13.33
QTZ	46.12	67.79
NE	33.65	20.92
KP	20.23	11.29
CAO+BAO+SRC	27.65	33.31
NA2O	39.73	43.31
K2O+RB2O	32.60	23.39
MGO	3.71	6.51
ALK+RB2O	94.33	82.10
FE AS FEO	31.91	31.39
FE2/FE2+FE3	29.19	29.29

OR+AB+AN	86.74
NE+LC+KP	0.00
AC+DI+HY*	4.23
OL+CS	0.00
MT+CM+HM	4.95
IL+SPH**	1.01
DIFF.IND.	76.55
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.765

****CY45B **** #60179

	WT.PC	MOL.PC	MOL.PR
SIO2	54.13	70.35	1.0713
TIO2	0.29	0.53	0.0035
AL2O3	17.75	11.33	0.1741
FE2O3	3.11	1.27	0.0195
FEO	0.27	0.25	0.0038
MNO	0.00	0.00	0.0000
MGO	0.27	0.44	0.0067
CAO	2.41	2.41	0.0430
NA2O	4.44	5.11	0.0781
K2O	5.44	3.73	0.0579
H2O+	1.29	4.63	0.0716
H2O-	0.00	0.00	0.0000
P2O5	0.01	0.01	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.05		
LESS O	0.00		
TOTAL	100.05		

	ATOMS
SI	57.298
TI	0.187
AL	14.032
FE3	2.033
FE2	0.231
MN	0.000
MG	0.558
CA	2.190
NA	3.551
K	6.173
H	7.659
TH	0.000
NC	0.000
AC	0.000
C	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
GL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	0.000
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	150.000

	CIPW NORM
QTZ	10.13
C	0.00
ZR	0.00
OR	32.45
AB	40.55
AN	10.55
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.97
WO	0.00
HY	0.22
GL	0.00
CS	0.00
MT	0.06
CM	0.00
HM	3.07
IL	0.53
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.02
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.29
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.05
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	38.39	37.27
AB+NE	43.90	50.38
AN	12.71	12.35
QTZ	51.40	72.38
NE	26.65	15.87
KP	21.95	11.74
CAO+BAO+SRO	18.99	24.03
NA2O	33.14	43.66
K2O+RB2O	42.67	32.30
MGO	1.93	3.62
ALK+RB2O	75.49	73.33
FE AS FEO	22.53	23.05
FE2/FE2+FE3	8.80	8.90
OR+AB+AN	83.75	
NE+LC+KP	0.00	
AC+DI+HY*	1.19	
OL+CS	0.00	
MT+CM+HM	3.13	
IL+SPH**	0.53	
DIFF.IND.	33.24	
SI UNSAT.	0.00	

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.781

****CY45C **** #60180

	WT.PC	MOL.PC	MOL.PR
SIO2	65.19	70.24	1.0848
TIO2	0.56	0.29	0.0045
AL2O3	17.55	11.07	0.1702
FE2O3	1.76	0.72	0.0110
FEO	1.06	0.95	0.0145
MNO	0.05	0.05	0.0007
MGO	0.58	0.94	0.0144
CAO	1.71	3.30	0.0662
NA2O	4.92	5.16	0.0794
K2O	4.02	2.78	0.0427
H2O+	0.82	3.18	0.0438
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.96		
LESS O	0.00		
TOTAL	99.96		

	ATOMS
SI	58.009
TI	0.241
AL	18.183
FE3	1.779
FE2	0.781
MN	0.038
MG	0.968
CA	3.538
NA	8.488
K	4.565
H	5.224
TH	0.000
NC	0.000
AC	0.000
C	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
GL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	0.000
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	99.96
FE/FE+MG	0.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	30.16	29.21
AB+NE	52.84	54.32
AN	17.00	16.47
QTZ	54.35	74.53
NE	23.56	16.56
KP	17.10	8.91
CAO+BAO+SRO	29.33	35.15
NA2O	38.29	42.17
K2O+RB2O	31.76	22.68
MGO	4.75	8.28
ALK+RB2O	73.26	70.22
FE AS FEO	21.99	21.50
FE2/FE2+FE3	40.99	41.00
OR+AB+AN	78.78	
NE+LC+KP	0.00	
AC+DI+HY*	3.29	
OL+CS	0.00	
MT+CM+HM	2.54	
IL+SPH**	0.66	
DIFF.IND.	78.97	
SI UNSAT.	0.00	

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.717

****CY46 **** #60181

	WT.PC	MOL.PC	MOL.PR
SIO2	55.73	61.38	0.9274
TIO2	0.61	0.51	0.0076
AL2O3	13.94	12.39	0.1858
FE2O3	3.96	1.66	0.0249
FEO	0.60	0.56	0.0084
MNO	0.19	0.18	0.0027
MGO	0.42	0.70	0.0104
CAO	3.41	4.06	0.0508
NA2O	4.88	5.25	0.0787
K2O	8.52	6.04	0.0905
H2O+	1.82	6.74	0.1010
H2O-	0.00	0.00	0.0000
P2O5	0.08	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.18		
LESS O	0.00		
TOTAL	99.18		

	ATOMS
SI	51.930
TI	0.428
AL	20.804
FE3	2.791
FE2	0.468
MN	0.150
MG	0.583
CA	3.405
NA	8.816
K	10.130
H	11.314
TH	0.000
NC	0.000
AC	0.000
C	0.000
NS	0.000
KS	0.000
DI	2.26
WO	3.71
HY	0.000
GL	0.000
CS	0.000
MT	0.79
CM	0.000
HM	3.44
IL	1.16
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.19
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	1.82
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	99.18
FE/FE+MG	0.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	58.67	50.97
AB+NE	35.95	44.36
AN	5.38	4.67
QTZ	37.23	59.79
NE	27.54	18.71
KP	35.23	21.50
CAO+BAO+SRO	20.29	26.44
NA2O	29.03	34.23
K2O+RB2O	50.64	39.33
MGO	2.31	4.33
ALK+RB2O	73.66	70.35
FE AS FEO	24.03	25.32
FE2/FE2+FE3	18.07	18.12
OR+AB+AN	73.50	
NE+LC+KP	12.33	
AC+DI+HY*	5.96	
OL+CS	0.00	
MT+CM+HM	4.22	
IL+SPH**	1.16	
DIFF.IND.	81.21	
SI UNSAT.	10.43	

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.911

****CY47A **** #60182

	WT.PC	MOL.PC	MOL.PR
SIO2	64.02	67.12	1.0653
TIO2	0.56	0.29	0.0373
AL2O3	19.67	12.15	0.1929
FE2O3	1.15	0.45	0.0072
FEO	0.36	0.32	0.0050
MNO	0.01	0.01	0.0001
MGO	0.13	0.24	0.0045
CAO	1.79	2.01	0.0319
NA2O	4.55	4.62	0.0734
K2O	6.62	4.43	0.0703
H2O+	2.32	8.11	0.1288
H2O-	0.00	0.00	0.0000
P2O5	0.07	0.03	0.0005
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.32		
LESS O	0.00		
TOTAL	101.32		

	ATOMS
SI	55.667
TI	0.379
AL	20.152
FE3	0.753
FE2	0.252
MN	0.007
MG	0.233
CA	1.663
NA	7.670
K	7.345
H	13.458
TH	0.000
NC	0.000
AC	0.000
C	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
GL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	2.32
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.32
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+AB+AN	45.47	44.25
NE+LC+KP	44.74	46.21
AC+DI+HY*	9.79	9.53
QTZ	49.66	71.27
NE	24.27	14.67
KP	25.87	14.05
CAO+BAO+SRO	13.61	18.18
NA2O	35.11	41.80
K2O+RB2O	51.03	40.03
MGO	1.41	2.66
ALK+RB2O	87.53	85.68
FE AS FEO	11.01	11.66
FE2/FE2+FE3	26.34	26.35
OR+AB+AN	86.05	
NE+LC+KP	0.00	
AC+DI+HY*	0.45	
OL+CS	0.00	
MT+CM+HM	1.15	
IL+SPH**	0.95	
DIFF.IND.	85.93	
SI UNSAT.	0.00	

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.745

****CY473 **** #60183

	WT.PC	MOL.PC	MOL.PR
SIO2	60.82	63.93	1.0647
TIO2	0.25	0.20	0.0025
AL2O3	19.03	12.14	0.1468
FE2O3	5.00	1.22	0.0163
FEO	0.18	0.15	0.0025
MNO	0.04	0.04	0.0006
MGO	0.13	0.18	0.0025
CAO	2.72	3.06	0.0435
NA2O	4.99	5.11	0.0825
K2O	5.93	4.02	0.0619
H2O+	2.16	7.79	0.1199
H2O-	0.00	0.00	0.0000
P2O5	0.19	0.09	0.0013
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.46		
LESSO	0.00		
TOTAL	99.46		

SI	54.100	QTZ	3.86
TI	0.191	C	0.55
AL	20.116	ZR	0.00
FE3	2.623	OR	34.46
FE2	0.155	AB	42.22
MN	0.040	AN	12.25
MG	0.154	LC	0.00
CA	3.611	NE	0.00
NA	8.657	KP	0.00
K	6.665	HL	0.00
OH	12.910	TH	0.00
	0.000	NC	0.00
P	0.144	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	0.00
CR	0.000	WO	0.00
V	0.000	HY	0.25
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	0.00
SR	0.000	CM	0.00
F	0.000	HM	3.00
CL	0.000	IL	0.47
S	0.000	SPH	0.00
S	0.000	PF	0.00
LI	0.000	RU	0.33
RB	0.000	AP	0.00
O	160.000	MAP	0.45
		FL	0.00
		PY	0.00
		CC	0.30
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	2.15
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	99.46
		FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	39.75	37.65
AB+NE	47.47	48.96
AN	13.73	13.39
QTZ	47.23	58.93
NE	28.41	17.53
KP	24.32	13.49
CAO+BAO+SRO	20.09	25.41
NA2O	36.85	42.17
K2O+RB2O	43.06	32.42
MGO	0.72	1.34
ALK+RB2O	78.13	76.76
FE AS FEO	21.09	21.91
FE2/FE2+FE3	7.54	7.55

OR+AB+AN	88.93	CAO+BAO+SRO	25.42
NE+LC+KP	0.00	NA2O	29.97
AC+DI+HY*	0.25	K2O+RB2O	44.61
OL+CS	0.00		
MT+CM+HM	3.00	MGO	4.00
IL+SPH**	0.30	ALK+RB2O	73.43
		FE AS FEO	22.60
DIFF.IND.	80.52		
SI UNSAT.	0.00	FE2/FE2+FE3	44.64

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.762

****CY472 **** #60184

	WT.PC	MOL.PC	MOL.PR
SIO2	61.25	66.32	1.0942
TIO2	0.53	0.43	0.0066
AL2O3	17.46	11.47	0.1752
FE2O3	2.01	0.83	0.0126
FEO	1.25	1.17	0.0179
MNO	0.19	0.13	0.0027
MGO	0.53	0.86	0.0144
CAO	3.93	4.56	0.0547
NA2O	4.28	4.53	0.0593
K2O	6.37	4.54	0.0476
H2O+	1.52	4.81	0.0733
H2O-	0.00	0.00	0.0000
P2O5	0.10	0.05	0.0007
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.40		
LESSO	0.00		
TOTAL	99.40		

SI	55.695	QTZ	4.97
TI	0.362	C	0.55
AL	19.144	ZR	0.00
FE3	1.376	OR	37.65
FE2	0.673	AB	36.31
MN	0.146	AN	10.71
MG	0.746	LC	0.00
CA	3.537	NE	0.00
NA	7.545	KP	0.00
K	7.391	HL	0.00
OH	8.607	TH	0.00
	0.000	NC	0.00
P	0.077	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	3.43
CR	0.000	WO	0.96
V	0.000	HY	0.00
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	2.91
SR	0.000	CM	0.00
F	0.000	HM	0.00
CL	0.000	IL	1.01
S	0.000	SPH	0.00
S	0.000	PF	0.00
LI	0.000	RU	0.00
RB	0.000	AP	0.00
O	160.000	MAP	0.24
		FL	0.00
		PY	0.00
		CC	0.00
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	1.32
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	99.40
		FE/FE+MG	0.03

RATIOS	WT.PC	MOL.PC
OR+LC+KP	44.52	43.37
AB+NE	42.82	44.23
AN	12.67	12.35
QTZ	47.93	69.72
NE	24.84	15.30
KP	27.14	14.98
CAO+BAO+SRO	25.42	32.14
NA2O	29.97	34.23
K2O+RB2O	44.61	33.63
MGO	4.00	7.31
ALK+RB2O	73.43	69.47
FE AS FEO	22.60	23.21
FE2/FE2+FE3	44.64	44.88

OR+AB+AN	94.57		
NE+LC+KP	0.00		
AC+DI+HY*	4.39		
OL+CS	0.00		
MT+CM+HM	2.91		
IL+SPH**	1.01		
DIFF.IND.	78.83		
SI UNSAT.	0.00		

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.780

****CY48 **** #60185

	WT.PC	MOL.PC	MOL.PR
SIO2	65.77	73.78	1.0944
TIO2	0.28	0.24	0.0035
AL2O3	16.86	11.15	0.1654
FE2O3	1.68	0.71	0.0105
FEO	0.36	0.34	0.0050
MNO	0.02	0.02	0.0003
MGO	0.23	0.38	0.0057
CAO	1.93	2.32	0.0344
NA2O	4.25	4.62	0.0686
K2O	5.90	4.22	0.0625
H2O+	0.59	2.21	0.0327
H2O-	0.00	0.00	0.0000
P2O5	0.03	0.01	0.0002
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	97.90		
LESSO	0.00		
TOTAL	97.90		

SI	59.684	QTZ	14.07
TI	0.191	C	0.05
AL	15.035	ZR	0.00
FE3	1.147	OR	34.87
FE2	0.273	AB	35.96
MN	0.015	AN	9.38
MG	0.311	LC	0.00
CA	1.877	NE	0.00
NA	7.477	KP	0.00
K	6.832	HL	0.00
OH	3.572	TH	0.00
	0.000	NC	0.00
P	0.023	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	0.00
CR	0.000	WO	0.00
V	0.000	HY	0.57
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	0.41
SR	0.000	CM	0.00
F	0.000	HM	1.39
CL	0.000	IL	0.53
S	0.000	SPH	0.00
S	0.000	PF	0.00
LI	0.000	RU	0.00
RB	0.000	AP	0.00
O	160.000	MAP	0.07
		FL	0.00
		PY	0.00
		CC	0.00
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	0.59
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	97.90
		FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	43.48	42.31
AB+NE	44.83	46.31
AN	11.69	11.39
QTZ	53.72	74.31
NE	22.94	13.42
KP	23.34	12.27
CAO+BAO+SRO	15.98	20.79
NA2O	35.18	41.40
K2O+RB2O	48.94	37.82
MGO	1.87	3.49
ALK+RB2O	82.71	80.37
FE AS FEO	15.41	16.13
FE2/FE2+FE3	20.09	20.10

OR+AB+AN	80.21	CAO+BAO+SRO	24.93
NE+LC+KP	0.00	NA2O	37.34
AC+DI+HY*	0.57	K2O+RB2O	33.63
OL+CS	0.00		
MT+CM+HM	1.81	MGO	3.87
IL+SPH**	0.53	ALK+RB2O	73.53
		FE AS FEO	17.65
DIFF.IND.	84.90		
SI UNSAT.	0.00	FE2/FE2+FE3	47.91

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.793

****CY49 **** #60186

	WT.PC	MOL.PC	MOL.PR
SIO2	55.05	71.31	1.0825
TIO2	0.29	0.23	0.0035
AL2O3	17.36	11.29	0.1703
FE2O3	1.16	0.43	0.0073
FEO	0.91	0.34	0.0127
MNO	0.05	0.05	0.0007
MGO	0.44	0.72	0.0109
CAO	3.64	4.31	0.0649
NA2O	4.69	5.92	0.0757
K2O	4.23	2.99	0.0449
H2O+	0.61	2.25	0.0339
H2O-	0.00	0.00	0.0000
P2O5	0.05	0.02	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.47		
LESSO	0.00		
TOTAL	98.47		

SI	58.712	QTZ	13.95
TI	0.190	C	0.00
AL	13.470	ZR	0.00
FE3	0.738	OR	25.00
FE2	0.687	AB	39.68
MN	0.038	AN	13.85
MG	0.592	LC	0.00
CA	3.521	NE	0.00
NA	8.207	KP	0.00
K	4.872	HL	0.00
OH	3.673	TH	0.00
	0.000	NC	0.00
P	0.038	AC	0.00
C	0.000	NS	0.00
	0.000	KS	0.00
ZR	0.000	DI	3.01
CR	0.000	WO	0.36
V	0.000	HY	0.00
NI	0.000	OL	0.00
CO	0.000	CS	0.00
BA	0.000	MT	1.69
SR	0.000	CM	0.00
F	0.000	HM	0.00
CL	0.000	IL	0.53
S	0.000	SPH	0.00
S	0.000	PF	0.00
LI	0.000	RU	0.00
RB	0.000	AP	0.00
O	160.000	MAP	0.12
		FL	0.00
		PY	0.00
		CC	0.00
		MAGN	0.00
		CHALY	0.00
		SPOD	0.00
		H2O+	0.61
		H2O-	0.00
		OTHERS	0.00
		SI.DEF.	0.00
		TOTAL	98.47
		FE/FE+MG	0.19

RATIOS	WT.PC	MOL.PC
OR+LC+KP	51.84	50.88
AB+NE	30.54	32.03
AN	17.61	17.09
QTZ	54.60	74.76
NE	27.34	15.44
KP	18.07	9.40
CAO+BAO+SRO	24.93	35.00
NA2O	37.34	40.79
K2O+RB2O	33.63	24.21
MGO	3.87	6.85
ALK+RB2O	73.53	75.65
FE AS FEO	17.65	17.59
FE2/FE2+FE3	47.91	47.93

OR+AB+AN	78.51		
NE+LC+KP	0.00		
AC+DI+HY*	3.07		
OL+CS	0.00		
MT+CM+HM	1.69		
IL+SPH**	0.53		
DIFF.IND.	78.53		
SI UNSAT.	0.00		

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.708

****CY50 **** #60187

	WT.PC	MOL.PC	MOL.PR
SIO2	53.88	52.13	0.8966
TIO2	0.46	0.33	0.0059
AL2O3	12.42	7.50	0.1257
FE2O3	3.35	1.45	0.0241
FEO	4.51	3.73	0.0648
MNO	0.18	0.15	0.0033
MGO	9.19	13.76	0.2277
CAO	11.23	12.15	0.2011
NA2O	0.21	0.20	0.0034
K2O	1.00	0.64	0.0106
H2O+	1.69	5.67	0.0933
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.15		
LESSO	0.00		
TOTAL	99.15		

	ATOMS
SI	50.170
TI	0.322
AL	14.072
FE3	2.698
FE2	3.515
MN	0.142
MG	12.760
CA	11.255
NA	0.379
K	1.158
OH	10.496
P	0.071
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	14.34
C	0.00
ZR	0.00
OR	5.91
AB	1.74
AN	31.09
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	19.23
WO	0.00
HY	18.40
OL	0.00
CS	0.00
MT	5.53
CM	0.00
HM	0.00
IL	0.67
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.59
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.15
FE/FE+MG	0.13
OR+AB+AN	39.77
NE+LC+KP	0.00
AC+DI+HY*	37.63
OL+CS	0.00
MT+CM+HM	5.58
IL+SPH**	0.87
DIFF.IND.	22.03
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	15.24	15.19
AB+NE	4.53	4.35
AN	30.17	79.96
QTZ	30.39	91.32
NE	4.37	2.10
KP	15.24	6.58
CAO+BAO+SRO	90.31	93.49
NA2O	1.63	1.57
K2O+RB2O	8.01	4.93
MGO	49.50	64.10
ALK+RB2O	6.52	3.94
FE AS FEO	43.97	31.96
FE2/FE2+FE3	57.52	57.53

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CY52 **** #60188

	WT.PC	MOL.PC	MOL.PR
SIO2	61.75	65.74	1.0275
TIO2	0.50	0.40	0.0063
AL2O3	17.02	10.67	0.1669
FE2O3	2.68	1.07	0.0168
FEO	1.96	1.75	0.0275
MNO	0.09	0.03	0.0015
MGO	1.51	2.40	0.0595
CAO	3.71	4.23	0.0662
NA2O	4.35	4.49	0.0702
K2O	4.13	2.84	0.0444
H2O+	1.73	6.15	0.0960
H2O-	0.00	0.00	0.0000
P2O5	0.26	0.13	0.0015
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.74		
LESSO	0.00		
TOTAL	99.74		

	ATOMS
SI	55.344
TI	0.337
AL	17.932
FE3	1.408
FE2	1.469
MN	0.069
MG	2.017
CA	3.593
NA	7.559
K	4.790
OH	10.344
P	0.197
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	11.11
C	0.00
ZR	0.00
OR	24.71
AB	36.53
AN	14.27
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.84
WO	0.00
HY	3.59
OL	0.00
CS	0.00
MT	3.89
CM	0.00
HM	0.00
IL	2.95
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.61
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.73
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.74
FE/FE+MG	0.13
OR+AB+AN	76.09
NE+LC+KP	0.00
AC+DI+HY*	5.38
OL+CS	0.00
MT+CM+HM	3.89
IL+SPH**	0.95
DIFF.IND.	72.63
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	32.47	31.53
AB+NE	48.37	49.86
AN	19.15	18.61
QTZ	53.21	73.73
NE	27.43	16.09
KP	19.33	10.18
CAO+BAO+SRO	30.31	36.61
NA2O	35.54	38.23
K2O+RB2O	34.15	24.56
MGO	10.41	17.49
ALK+RB2O	38.82	53.50
FE AS FEO	39.77	29.01
FE2/FE2+FE3	45.95	45.96

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.687

****CY52D **** #60189

	WT.PC	MOL.PC	MOL.PR
SIO2	53.23	52.32	0.8858
TIO2	0.47	0.35	0.0059
AL2O3	14.40	8.34	0.1412
FE2O3	0.32	0.12	0.0020
FEO	8.11	6.67	0.1129
MNO	0.17	0.14	0.0024
MGO	7.65	11.21	0.1897
CAO	10.48	11.04	0.1869
NA2O	1.11	1.06	0.0179
K2O	1.21	0.76	0.0128
H2O+	2.43	7.97	0.1349
H2O-	0.00	0.00	0.0000
P2O5	0.03	0.03	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.66		
LESSO	0.00		
TOTAL	99.66		

	ATOMS
SI	49.323
TI	0.328
AL	15.729
FE3	0.223
FE2	6.285
MN	0.133
MG	10.565
CA	10.406
NA	1.994
K	1.431
OH	15.021
P	0.063
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	8.53
C	0.00
ZR	0.00
OR	7.45
AB	9.39
AN	30.74
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	16.99
WO	0.00
HY	24.89
OL	0.00
CS	0.00
MT	0.46
CM	0.00
HM	0.00
IL	0.89
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.19
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.43
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.66
FE/FE+MG	0.36
OR+AB+AN	47.28
NE+LC+KP	0.00
AC+DI+HY*	41.83
OL+CS	0.00
MT+CM+HM	0.46
IL+SPH**	0.89
DIFF.IND.	23.07
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	15.13	14.94
AB+NE	19.66	20.82
AN	65.01	64.24
QTZ	60.34	79.02
NE	22.03	12.21
KP	17.61	8.76
CAO+BAO+SRO	91.84	85.87
NA2O	3.67	8.23
K2O+RB2O	9.45	5.90
MGO	41.27	55.84
ALK+RB2O	12.51	9.05
FE AS FEO	46.22	35.11
FE2/FE2+FE3	96.64	96.64

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CY53 **** #60190

	WT.PC	MOL.PC	MOL.PR
SIO2	65.15	66.46	1.0941
TIO2	0.38	0.29	0.0048
AL2O3	17.00	10.22	0.1667
FE2O3	2.14	0.82	0.0134
FEO	1.00	0.85	0.0139
MNO	0.10	0.09	0.0014
MGO	0.72	1.09	0.0179
CAO	3.81	4.17	0.0679
NA2O	5.59	5.53	0.0902
K2O	3.69	2.40	0.0392
H2O+	2.36	8.03	0.1310
H2O-	0.00	0.00	0.0000
P2O5	0.10	0.04	0.0007
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.04		
LESSO	0.00		
TOTAL	102.04		

	ATOMS
SI	56.261
TI	0.247
AL	17.305
FE3	1.391
FE2	0.722
MN	0.073
MG	0.927
CA	3.526
NA	9.359
K	4.066
OH	13.596
P	0.073
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	11.25
C	0.00
ZR	0.00
OR	21.31
AB	47.30
AN	10.40
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	5.87
WO	1.20
HY	0.00
OL	0.00
CS	0.00
MT	2.45
CM	0.00
HM	0.45
IL	0.72
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.24
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.36
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.04
FE/FE+MG	0.00
OR+AB+AN	79.51
NE+LC+KP	0.00
AC+DI+HY*	5.07
OL+CS	0.00
MT+CM+HM	2.90
IL+SPH**	0.72
DIFF.IND.	60.36
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	27.43	26.46
AB+NE	59.49	60.91
AN	13.03	12.63
QTZ	52.69	73.14
NE	31.83	18.72
KP	15.42	8.13
CAO+BAO+SRO	29.11	34.44
NA2O	42.70	45.71
K2O+RB2O	28.19	19.86
MGO	3.53	9.43
ALK+RB2O	71.24	68.32
FE AS FEO	23.23	22.25
FE2/FE2+FE3	36.36	36.38

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.776

****CY55 **** #60191

	WT.PC	MOL.PC	MOL.PR
SIO2	65.57	68.24	1.1077
TIO2	0.38	0.30	0.0044
AL2O3	17.12	10.34	0.1679
FE2O3	1.72	0.66	0.0108
FEO	1.71	1.47	0.0238
MNO	0.14	0.12	0.0020
MGO	1.12	1.71	0.0278
CAO	3.53	3.94	0.0529
NA2O	4.62	4.59	0.0745
K2O	3.06	2.00	0.0325
H2O+	1.94	6.63	0.1077
H2O-	0.00	0.00	0.0000
P2O5	0.15	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.06		
LESSO	0.00		
TOTAL	102.06		

	ATOMS
SI	57.220
TI	0.248
AL	17.346
FE3	1.113
FE2	1.229
MN	0.102
MG	1.755
CA	3.251
NA	7.799
K	3.356
LH	11.124
	0.000
P	0.109
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	18.56
C	0.15
ZR	0.00
OR	18.09
AB	39.09
AN	16.53
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	4.14
OL	0.00
CS	0.00
MT	2.49
CM	0.00
HM	0.00
IL	0.72
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.35
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.93
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.06
FE/FE+MG	0.27

RATIOS	WT.PC	MOL.PC
OR+LC+KP	24.54	23.76
AB+NE	53.03	54.51
AN	22.43	21.73
QTZ	58.47	77.49
NE	27.96	15.67
KP	13.57	6.83
CAO+BAO+SRO	31.49	37.04
NA2O	41.21	43.85
K2O+RB2O	27.30	19.11
MGO	2.13	15.25
ALK+RB2O	62.96	58.76
FE AS FEO	27.85	25.98
FE2/FE2+FE3	54.45	54.47

OR+AB+AN	73.71
NE+LC+KP	0.00
AC+DI+HY*	4.14
OL+CS	0.00
MT+CM+HM	2.49
IL+SPH**	0.72
DIFF.IND.	75.73
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.637

****CY56 **** #60192

	WT.PC	MOL.PC	MOL.PR
SIO2	56.74	57.41	0.9562
TIO2	0.60	0.45	0.0075
AL2O3	18.71	11.16	0.1859
FE2O3	3.20	1.22	0.0200
FEO	1.72	1.48	0.0259
MNO	0.21	0.13	0.0030
MGO	1.08	1.63	0.0268
CAO	5.12	5.55	0.0915
NA2O	4.46	4.37	0.0719
K2O	6.49	4.19	0.0639
H2O+	3.65	12.32	0.2026
H2O-	0.00	0.00	0.0000
P2O5	0.14	0.05	0.0013
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.12		
LESSO	0.00		
TOTAL	102.12		

	ATOMS
SI	50.233
TI	0.400
AL	19.526
FE3	2.152
FE2	1.574
MN	0.156
MG	1.425
CA	4.857
NA	7.655
K	7.332
OH	21.556
	0.000
P	0.105
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	38.36
AB	30.38
AN	11.87
LC	0.00
NE	4.14
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	5.80
WO	2.16
HY	0.00
OL	0.00
CS	0.00
MT	4.47
CM	0.00
HM	0.10
IL	1.14
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.33
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	3.54
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.12
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	45.42	42.49
AB+NE	40.53	44.36
AN	14.05	13.15
QTZ	41.81	64.19
NE	28.15	18.29
KP	30.03	17.52
CAO+BAO+SRO	31.66	39.33
NA2O	27.75	30.99
K2O+RB2O	40.59	29.68
MGO	5.41	11.42
ALK+RB2O	65.03	50.03
FE AS FEO	28.56	28.55
FE2/FE2+FE3	40.13	40.16

OR+AB+AN	80.31
NE+LC+KP	4.14
AC+DI+HY*	7.95
OL+CS	0.00
MT+CM+HM	4.59
IL+SPH**	1.14
DIFF.IND.	72.59
SI UNSAT.	3.51

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.767

****CY57 **** #60193

	WT.PC	MOL.PC	MOL.PR
SIO2	55.53	58.06	0.9240
TIO2	0.67	0.53	0.0084
AL2O3	14.74	9.08	0.1446
FE2O3	1.27	0.50	0.0080
FEO	6.59	5.76	0.0917
MNO	0.14	0.12	0.0020
MGO	5.55	8.65	0.1378
CAO	9.93	11.13	0.1771
NA2O	1.31	1.33	0.0211
K2O	1.03	0.69	0.0109
H2O+	1.18	4.12	0.0655
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.03		
LESSO	0.00		
TOTAL	98.03		

	ATOMS
SI	52.214
TI	0.474
AL	16.338
FE3	0.699
FE2	5.183
MN	0.112
MG	7.773
CA	10.005
NA	2.388
K	1.236
OH	7.402
	0.000
P	0.072
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	13.77
C	0.00
ZR	0.00
OR	6.09
AB	11.08
AN	31.30
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	14.24
WO	0.00
HY	17.05
OL	0.00
CS	0.00
MT	1.84
CM	0.00
HM	0.00
IL	1.27
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.18
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.03
FE/FE+MG	0.36

RATIOS	WT.PC	MOL.PC
OR+LC+KP	12.56	12.38
AB+NE	22.87	23.93
AN	64.57	63.69
QTZ	69.42	84.79
NE	19.40	10.02
KP	11.15	5.19
CAO+BAO+SRO	80.93	84.67
NA2O	10.64	10.10
K2O+RB2O	8.39	5.23
MGO	35.21	49.29
ALK+RB2O	14.33	11.45
FE AS FEO	49.95	39.24
FE2/FE2+FE3	65.48	85.49

OR+AB+AN	48.47
NE+LC+KP	0.00
AC+DI+HY*	31.29
OL+CS	0.00
MT+CM+HM	1.84
IL+SPH**	1.27
DIFF.IND.	30.94
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.716

****CY60 **** #60194

	WT.PC	MOL.PC	MOL.PR
SIO2	64.42	68.06	1.0720
TIO2	0.46	0.32	0.0050
AL2O3	17.21	10.72	0.1688
FE2O3	2.50	0.99	0.0157
FEO	2.17	1.92	0.0302
MNO	0.11	0.10	0.0016
MGO	0.97	1.53	0.0241
CAO	3.73	4.22	0.0665
NA2O	5.14	5.26	0.0829
K2O	3.57	2.41	0.0379
H2O+	1.25	4.40	0.0694
H2O-	0.00	0.00	0.0000
P2O5	0.17	0.08	0.0012
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.64		
LESSO	0.00		
TOTAL	101.64		

	ATOMS
SI	56.684
TI	0.265
AL	17.051
FE3	1.656
FE2	1.597
MN	0.092
MG	1.272
CA	3.517
NA	8.768
K	4.008
OH	7.338
	0.000
P	0.127
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	12.11
C	0.00
ZR	0.00
OR	21.10
AB	43.49
AN	13.35
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	3.29
WO	0.00
HY	2.27
OL	0.00
CS	0.00
MT	3.62
CM	0.00
HM	0.00
IL	0.76
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.40
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.24
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.64
FE/FE+MG	0.32

RATIOS	WT.PC	MOL.PC
OR+LC+KP	27.07	26.17
AB+NE	55.80	57.26
AN	17.13	16.57
QTZ	53.65	73.92
NE	30.72	17.90
KP	15.63	8.18
CAO+BAO+SRO	29.93	35.51
NA2O	41.32	44.26
K2O+RB2O	28.70	20.23
MGO	6.83	11.57
ALK+RB2O	61.39	59.10
FE AS FEO	31.83	30.35
FE2/FE2+FE3	50.34	50.35

OR+AB+AN	77.94
NE+LC+KP	0.00
AC+DI+HY*	5.57
OL+CS	0.00
MT+CM+HM	3.62
IL+SPH**	0.76
DIFF.IND.	76.70
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****CY61 **** #60195

	WT.PC	MOL.PC	MOL.PR
SIO2	63.98	64.17	1.0643
TIO2	0.13	0.11	0.0016
AL2O3	19.47	12.93	0.1267
FE2O3	1.82	0.75	0.0116
FEO	0.04	0.03	0.0015
MNO	0.05	0.06	0.0007
MGO	0.27	0.43	0.0067
CAO	0.53	0.51	0.0095
NA2O	6.19	6.42	0.0993
K2O	6.17	4.31	0.0655
H2O+	1.79	6.39	0.0994
H2O-	0.00	0.00	0.0000
P2O5	0.02	0.01	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.92		
LESSO	0.00		
TOTAL	100.92		

	ATOMS
SI	56.111
TI	0.046
AL	20.546
ZR	0.000
CR	1.202
FE3	0.858
FE2	0.000
MN	0.037
MG	0.353
CA	0.498
NA	10.527
K	6.906
OH	10.475
P	0.015
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	2.38
C	2.36
ZR	0.00
OR	36.47
AB	52.37
AN	2.50
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.67
OL	0.00
CS	0.00
MT	0.03
CM	0.00
HM	1.77
IL	0.25
SPH	0.30
PF	0.00
RU	0.00
AP	0.00
HAP	0.05
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.79
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.92
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	39.95	38.57
AB+NE	57.34	58.79
AN	2.74	2.64
QTZ	46.43	68.21
NE	30.93	19.20
KP	22.59	12.60
CAO+BAO+SRO	4.11	5.41
NA2O	43.02	57.12
K2O+RB2O	47.87	37.47
MGO	1.87	3.40
ALK+RB2O	35.79	84.02
FE AS FEO	12.34	12.58
FE2/FE2+FE3	7.83	7.91

OR+AB+AN	91.34
NE+LC+KP	0.00
AC+DI+HY*	0.67
OL+CS	0.00
MT+CM+HM	1.84
IL+SPH**	0.25
DIFF.IND.	91.73
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.848

****CY62 **** #60196

	WT.PC	MOL.PC	MOL.PR
SIO2	56.22	52.60	0.8762
TIO2	0.10	0.07	0.0013
AL2O3	17.84	10.29	0.1758
FE2O3	3.83	1.61	0.0240
FEO	2.64	2.01	0.0146
MNO	0.22	0.18	0.0031
MGO	1.25	1.73	0.0305
CAO	5.11	5.11	0.0911
NA2O	3.54	3.33	0.0571
K2O	7.94	4.91	0.0965
H2O+	5.44	17.60	0.3023
H2O-	0.00	0.00	0.0000
P2O5	0.21	0.07	0.0015
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.86		
LESSO	0.00		
TOTAL	102.86		

	ATOMS
SI	47.632
TI	0.058
AL	18.470
FE3	2.532
FE2	1.922
MN	0.154
MG	1.610
CA	4.809
NA	6.028
K	5.399
OH	31.875
P	0.090
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	46.93
AB	16.85
AN	9.34
LC	0.00
NE	7.11
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	7.51
WO	2.15
HY	0.00
OL	0.00
CS	0.00
MT	5.55
CM	0.00
HM	0.00
IL	1.52
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.50
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	5.43
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.86
FE/FE+MG	0.11

RATIOS	WT.PC	MOL.PC
OR+LC+KP	38.51	53.29
AB+NE	29.85	30.10
AN	11.65	10.61
QTZ	39.43	62.21
NE	22.69	15.96
KP	37.63	22.53
CAO+BAO+SRO	30.60	39.19
NA2O	21.39	24.56
K2O+RB2O	47.85	36.25
MGO	6.52	11.85
ALK+RB2O	60.83	54.91
FE AS FEO	32.60	33.24
FE2/FE2+FE3	43.93	43.96

OR+AB+AN	73.10
NE+LC+KP	7.11
AC+DI+HY*	9.65
OL+CS	0.00
MT+CM+HM	5.55
IL+SPH**	1.52
DIFF.IND.	70.67
SI UNSAT.	6.01

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.808

****CY63 **** #60197

	WT.PC	MOL.PC	MOL.PR
SIO2	67.47	70.43	1.1227
TIO2	0.42	0.33	0.0053
AL2O3	18.36	11.30	0.1801
FE2O3	1.38	0.54	0.0086
FEO	0.00	0.00	0.0000
MNO	0.01	0.01	0.0001
MGO	0.15	0.23	0.0037
CAO	2.67	2.99	0.0476
NA2O	5.02	5.08	0.0810
K2O	3.63	2.42	0.0385
H2O+	1.90	6.62	0.1055
H2O-	0.00	0.00	0.0000
P2O5	0.14	0.06	0.0010
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.15		
LESSO	0.00		
TOTAL	101.15		

	ATOMS
SI	57.882
TI	0.271
AL	18.567
FE3	0.891
FE2	0.000
MN	0.007
MG	0.192
CA	2.455
NA	8.349
K	3.974
OH	10.874
P	0.102
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	18.83
C	1.66
ZR	0.00
OR	21.46
AB	42.47
AN	12.33
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.37
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	1.38
IL	0.02
SPH	0.00
PF	0.00
RU	0.41
AP	0.00
HAP	0.33
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.89
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.15
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	28.13	27.20
AB+NE	55.70	57.16
AN	16.17	15.64
QTZ	57.46	76.80
NE	27.80	15.72
KP	14.73	7.48
CAO+BAO+SRO	23.59	28.49
NA2O	44.35	44.45
K2O+RB2O	32.07	23.06
MGO	1.49	2.64
ALK+RB2O	86.05	84.97
FE AS FEO	12.45	12.39
FE2/FE2+FE3	0.80	0.81

OR+AB+AN	76.26
NE+LC+KP	0.00
AC+DI+HY*	0.37
OL+CS	0.00
MT+CM+HM	1.38
IL+SPH**	0.43
DIFF.IND.	42.75
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.664

****CY64 **** #60198

	WT.PC	MOL.PC	MOL.PR
SIO2	59.55	63.79	0.9909
TIO2	0.53	0.43	0.0066
AL2O3	18.27	11.54	0.1792
FE2O3	2.78	1.12	0.0174
FEO	2.70	2.42	0.0375
MNO	0.09	0.08	0.0013
MGO	1.24	1.98	0.0303
CAO	4.67	5.36	0.0833
NA2O	4.96	5.15	0.0309
K2O	5.06	3.45	0.0537
H2O+	1.27	4.54	0.0705
H2O-	0.00	0.00	0.0000
P2O5	0.30	0.14	0.0021
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.42		
LESSO	0.00		
TOTAL	101.42		

	ATOMS
SI	53.696
TI	0.359
AL	19.420
FE3	1.887
FE2	2.036
MN	0.059
MG	1.667
CA	4.513
NA	8.671
K	5.922
OH	7.640
P	0.229
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	1.28
C	0.00
ZR	0.00
OR	29.91
AB	41.97
AN	12.65
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	6.93
WO	0.00
HY	1.64
OL	0.00
CS	0.00
MT	4.93
CM	0.00
HM	0.00
IL	1.01
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.71
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.26
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.42
FE/FE+MG	0.32

RATIOS	WT.PC	MOL.PC
OR+LC+KP	35.34	34.34
AB+NE	49.65	51.14
AN	14.95	14.53
QTZ	45.69	67.53
NE	31.03	19.43
KP	23.25	13.04
CAO+BAO+SRO	31.79	38.37
NA2O	53.76	36.87
K2O+RB2O	54.45	24.76
MGO	7.49	12.91
ALK+RB2O	90.54	56.15
FE AS FEO	31.97	30.93
FE2/FE2+FE3	52.75	52.76

OR+AB+AN	84.52
NE+LC+KP	0.00
AC+DI+HY*	8.52
OL+CS	0.00
MT+CM+HM	4.05
IL+SPH**	1.01
DIFF.IND.	73.15
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.746

****CY67 **** #60199

	WT.PC	MOL.PC	MOL.PR
SIO2	64.91	69.21	1.0401
TIO2	0.42	0.33	0.0053
AL2O3	17.49	10.97	0.1711
FE2O3	2.07	0.83	0.0133
FEO	1.32	1.11	0.0184
MNO	0.06	0.06	0.0006
MGO	0.73	1.16	0.0181
CAO	3.42	4.35	0.0691
NA2O	4.20	4.34	0.0677
K2O	4.16	2.92	0.0442
H2O+	1.32	4.69	0.3733
H2O-	0.00	0.00	0.0000
P2O5	0.15	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.57		
LESSO	0.00		
TOTAL	100.57		

	ATOMS
SI	57.256
TI	0.279
AL	18.144
FE3	1.374
FE2	0.574
MN	0.030
MG	0.960
CA	3.611
NA	7.142
K	4.660
OH	7.767
NC	0.000
AC	0.000
P	0.112
C	0.000
NS	0.000
KS	0.000
DI	0.000
ZR	0.000
CR	0.000
WO	0.000
HY	0.000
CL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
O	160.000

	CIPW NORM
QTZ	16.35
C	0.00
ZR	0.00
OR	24.47
AB	35.54
AN	16.54
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.12
WO	0.00
HY	1.39
CL	0.00
CS	0.00
MT	3.00
CM	0.00
HM	0.00
IL	0.80
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.35
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.31
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.57
FE/FE+MG	0.04

RATIOS	WT.PC	MOL.PC
OR+LC+KP	31.97	31.04
AB+NE	46.42	47.90
AN	21.61	21.02
QTZ	56.41	76.16
NE	25.31	14.46
KP	18.23	9.38
CAO+BAO+SRO	31.41	37.88
NA2O	34.54	37.63
K2O+RB2O	34.05	24.44
MGO	5.94	10.37
ALK+RB2O	67.25	63.95
FE AS FEO	25.22	25.63
FE2/FE2+FE3	42.20	42.21

OR+AB+AN	76.54
NE+LC+KP	0.00
AC+DI+HY*	2.51
OL+CS	0.00
MT+CM+HM	3.00
IL+SPH**	0.80
DIFF.IND.	76.05
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.653

****CY69 **** #60200

	WT.PC	MOL.PC	MOL.PR
SIO2	65.69	66.36	1.0931
TIO2	0.37	0.28	0.0046
AL2O3	19.45	11.64	0.1912
FE2O3	3.42	1.30	0.0214
FEO	0.47	0.40	0.0065
MNO	0.01	0.01	0.0001
MGO	0.56	0.85	0.0139
CAO	0.88	0.96	0.0157
NA2O	5.27	5.19	0.0850
K2O	4.16	2.69	0.0442
H2O+	2.98	10.37	0.1654
H2O-	0.00	0.00	0.0000
P2O5	0.17	0.07	0.0012
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	103.47		
LESSO	0.00		
TOTAL	103.47		

	ATOMS
SI	55.172
TI	0.236
AL	19.296
FE3	2.162
FE2	0.330
MN	0.007
MG	0.721
CA	0.795
NA	8.581
K	4.455
OH	16.697
NC	0.000
AC	0.000
P	0.121
C	0.000
NS	0.000
KS	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	1[illegible].87
C	0.13
ZR	0.00
OR	24.59
AB	44.59
AN	3.26
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	1.39
CL	0.00
CS	0.00
MT	0.48
CM	0.00
HM	3.09
IL	0.70
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.40
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.97
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	103.47
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	33.95	32.71
AB+NE	61.56	62.96
AN	4.49	4.33
QTZ	55.69	75.53
NE	28.07	16.12
KP	16.24	8.37
CAO+BAO+SRO	3.56	10.83
NA2O	51.12	58.68
K2O+RB2O	40.33	30.49
MGO	4.13	7.21
ALK+RB2O	69.61	67.09
FE AS FEO	26.26	25.71
FE2/FE2+FE3	13.49	13.50

OR+AB+AN	72.43
NE+LC+KP	0.00
AC+DI+HY*	1.39
OL+CS	0.00
MT+CM+HM	3.57
IL+SPH**	0.70
DIFF.IND.	86.05
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.676

****CY70 **** #60201

	WT.PC	MOL.PC	MOL.PR
SIO2	65.45	69.14	1.0264
TIO2	0.32	0.27	0.0043
AL2O3	17.56	10.36	0.1722
FE2O3	2.14	0.95	0.0134
FEO	1.49	1.30	0.0206
MNO	0.02	0.02	0.0003
MGO	0.59	0.92	0.0146
CAO	2.49	2.30	0.0444
NA2O	4.82	4.90	0.0777
K2O	3.71	2.48	0.0394
H2O+	1.83	6.41	0.1016
H2O-	0.00	0.00	0.0000
P2O5	0.11	0.05	0.0008
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.98		
LESSO	0.00		
TOTAL	100.98		

	ATOMS
SI	57.316
TI	0.222
AL	18.066
FE3	1.401
FE2	1.077
MN	0.015
MG	0.765
CA	2.321
NA	8.129
K	4.113
OH	10.620
NC	0.000
AC	0.000
P	0.081
C	0.000
NS	0.000
KS	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	17.55
C	1.35
ZR	0.00
OR	21.93
AB	40.78
AN	11.63
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	1.89
OL	0.00
CS	0.00
MT	3.10
CM	0.00
HM	0.00
IL	0.65
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.26
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.83
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.98
FE/FE+MG	0.18

RATIOS	WT.PC	MOL.PC
OR+LC+KP	29.50	28.53
AB+NE	54.85	56.32
AN	15.65	15.15
QTZ	56.95	76.45
NE	27.52	15.65
KP	15.52	7.92
CAO+BAO+SRO	22.60	27.49
NA2O	43.74	48.13
K2O+RB2O	33.67	24.38
MGO	4.70	8.15
ALK+RB2O	67.99	65.28
FE AS FEO	27.31	26.57
FE2/FE2+FE3	43.79	43.79

OR+AB+AN	74.34
NE+LC+KP	0.00
AC+DI+HY*	1.89
OL+CS	0.00
MT+CM+HM	3.10
IL+SPH**	0.65
DIFF.IND.	80.26
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.680

****CY71 **** #60201

	WT.PC	MOL.PC	MOL.PR
SIO2	58.60	63.32	0.9761
TIO2	0.62	0.50	0.0078
AL2O3	18.00	11.41	0.1765
FE2O3	4.46	1.80	0.0279
FEO	1.78	1.59	0.0248
MNO	0.09	0.08	0.0013
MGO	1.62	2.60	0.0402
CAO	4.37	5.04	0.0779
NA2O	4.35	5.05	0.0782
K2O	5.15	3.53	0.0559
H2O+	1.44	5.17	0.0799
H2O-	0.00	0.00	0.0000
P2O5	0.37	0.17	0.0026
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.33		
LESSO	0.00		
TOTAL	101.33		

	ATOMS
SI	52.897
TI	0.421
AL	19.153
FE3	3.030
FE2	1.344
MN	0.069
MG	2.180
CA	4.227
NA	8.436
K	5.966
OH	3.672
NC	0.000
AC	0.000
P	0.293
C	0.000
NS	0.000
KS	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	1.34
C	0.00
ZR	0.00
OR	30.32
AB	41.04
AN	12.55
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	5.41
WO	0.00
HY	1.43
OL	0.00
CS	0.00
MT	4.23
CM	0.00
HM	1.54
IL	1.18
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.37
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.44
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.34
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+AB+AN	56.54	55.51
AB+NE	49.03	50.51
AN	14.43	13.98
QTZ	45.76	67.69
NE	30.46	19.03
KP	23.82	13.37
CAO+BAO+SRO	30.35	36.90
NA2O	33.60	37.05
K2O+RB2O	35.97	26.04
MGO	7.24	15.74
ALK+RB2O	57.21	52.13
FE AS FEO	33.55	32.03
FE2/FE2+FE3	51.79	51.80

OR+AB+AN	83.70
NE+LC+KP	0.00
AC+DI+HY*	7.03
OL+CS	0.00
MT+CM+HM	5.77
IL+SPH**	1.13
DIFF.IND.	73.04
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.755

****CY73 **** #60202

	WT.PC	MOL.PC	MOL.PR
SIO2	57.04	60.32	0.9492
TIO2	0.33	0.26	0.0041
AL2O3	19.76	12.32	0.1938
FE2O3	3.15	1.25	0.0197
FEO	0.50	0.44	0.0070
MNO	0.13	0.12	0.0018
MGO	0.24	0.38	0.0060
CAO	2.75	3.12	0.0490
NA2O	7.08	7.26	0.1142
K2O	7.93	5.35	0.0842
H2O+	2.60	9.17	0.1443
H2O-	0.00	0.00	0.0000
P2O5	0.05	0.02	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.56		
LESSO	0.00		
TOTAL	101.56		

	ATOMS
SI	51.386
TI	0.234
AL	20.984
FE3	2.136
FE2	0.377
MN	0.099
MG	0.322
CA	2.655
NA	12.366
K	9.116
H	15.626
	0.000
P	0.038
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM

QTZ	0.00
C	0.00
ZR	0.00
OR	46.47
AB	20.01
AN	0.00
LC	0.00
NE	20.30
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	2.12
NS	0.00
KS	0.00
DI	1.29
WO	4.87
HY	0.00
OL	0.00
CS	0.00
MT	1.08
CM	0.00
HM	1.67
IL	0.63
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.12
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.60
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.56
FE/FE+MG	0.00
OR+AB+AN	66.88
NE+LC+KP	20.30
AC+DI+HY*	5.28
OL+CS	0.00
MT+CM+HM	2.75
IL+SPH**	0.63
DIFF.IND.	87.19
SI UNSAT.	17.18

RATIOS	WT.PC	MOL.PC
OR+LC+KP	53.76	43.44
AB+NE	40.24	56.56
AN	0.00	0.00
QTZ	33.73	55.80
NE	35.72	25.00
KP	30.55	19.20
CAO+BAO+SRO	15.46	19.82
NA2O	39.86	46.16
K2O+RB2O	44.65	34.03
MGO	1.28	2.36
ALK+RB2O	80.21	78.54
FE AS FEO	18.51	19.10
FE2/FE2+FE3	18.19	18.22

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.024

****CY74 **** #60203

	WT.PC	MOL.PC	MOL.PR
SIO2	55.78	56.49	0.9282
TIO2	0.57	0.43	0.0071
AL2O3	17.95	10.72	0.1760
FE2O3	4.55	1.66	0.0272
FEO	1.37	1.08	0.0177
MNO	0.21	0.18	0.0030
MGO	0.54	0.82	0.0134
CAO	4.70	5.10	0.0838
NA2O	6.52	6.40	0.1052
K2O	7.36	4.76	0.0781
H2O+	3.65	12.53	0.2026
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.99		
LESSO	0.00		
TOTAL	102.99		

	ATOMS
SI	49.712
TI	0.382
AL	16.458
FE3	2.918
FE2	0.947
MN	0.169
MG	0.717
CA	4.489
NA	11.265
K	5.370
H	21.701
	0.000
P	0.068
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM

QTZ	0.00
C	0.00
ZR	0.00
OR	43.50
AB	16.28
AN	0.00
LC	0.00
NE	17.92
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	3.55
NS	0.00
KS	0.00
DI	2.90
WO	7.94
HY	0.00
OL	0.00
CS	0.00
MT	3.12
CM	0.00
HM	1.03
IL	1.06
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	3.65
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.99
FE/FE+MG	0.00
OR+AB+AN	61.78
NE+LC+KP	17.92
AC+DI+HY*	14.19
OL+CS	0.00
MT+CM+HM	4.16
IL+SPH**	1.08
DIFF.IND.	79.70
SI UNSAT.	15.16

RATIOS	WT.PC	MOL.PC
OR+LC+KP	54.53	44.38
AB+NE	45.42	55.62
AN	0.00	0.00
QTZ	34.03	56.21
NE	34.91	24.35
KP	31.01	19.44
CAO+BAO+SRO	25.30	31.38
NA2O	35.09	39.37
K2O+RB2O	39.61	29.25
MGO	2.73	4.93
ALK+RB2O	70.03	67.44
FE AS FEO	27.22	27.63
FE2/FE2+FE3	27.44	27.47

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.04

****CY75 **** #60204

	WT.PC	MOL.PC	MOL.PR
SIO2	62.08	67.41	1.0330
TIO2	0.50	0.41	0.0063
AL2O3	19.55	12.51	0.1917
FE2O3	2.17	0.89	0.0136
FEO	0.47	0.43	0.0065
MNO	0.12	0.11	0.0017
MGO	0.65	1.05	0.0161
CAO	2.97	3.46	0.0530
NA2O	4.99	5.25	0.0805
K2O	5.71	3.96	0.0606
H2O+	1.23	4.45	0.0683
H2O-	0.00	0.00	0.0000
P2O5	0.17	0.05	0.0012
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.61		
LESSO	0.00		
TOTAL	100.61		

	ATOMS
SI	55.330
TI	0.335
AL	20.540
FE3	1.456
FE2	0.350
MN	0.091
MG	0.363
CA	2.337
NA	8.622
K	6.494
H	7.313
	0.000
P	0.123
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM

QTZ	4.34
C	0.17
ZR	0.00
OR	33.75
AB	42.22
AN	13.62
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	1.62
OL	0.00
CS	0.00
MT	0.46
CM	0.00
HM	1.55
IL	0.95
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.40
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.22
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.61
FE/FE+MG	0.00
OR+AB+AN	85.59
NE+LC+KP	0.00
AC+DI+HY*	1.62
OL+CS	0.00
MT+CM+HM	2.51
IL+SPH**	0.95
DIFF.IND.	80.31
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	37.67	36.61
AB+NE	47.12	48.61
AN	15.21	14.79
QTZ	47.65	69.29
NE	28.48	17.52
KP	23.86	13.19
CAO+BAO+SRO	21.73	27.29
NA2O	35.50	41.48
K2O+RB2O	41.77	31.24
MGO	4.63	8.37
ALK+RB2O	77.02	73.25
FE AS FEO	18.33	18.38
FE2/FE2+FE3	23.20	23.25

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.736

****CY76 **** #60205

	WT.PC	MOL.PC	MOL.PR
SIO2	51.73	67.23	1.0280
TIO2	0.39	0.52	0.0049
AL2O3	17.71	11.37	0.1737
FE2O3	1.63	0.97	0.0102
FEO	1.96	1.79	0.0273
MNO	0.15	0.17	0.0025
MGO	0.81	1.51	0.0201
CAO	4.17	4.37	0.0744
NA2O	3.92	4.14	0.0632
K2O	5.13	3.55	0.0545
H2O+	1.23	4.47	0.0683
H2O-	0.00	0.00	0.0000
P2O5	0.12	0.35	0.0038
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.03		
LESSO	0.00		
TOTAL	99.03		

	ATOMS
SI	56.100
TI	0.266
AL	16.957
FE3	1.114
FE2	1.489
MN	0.138
MG	1.096
CA	4.058
NA	6.901
K	5.944
H	7.451
	0.000
P	0.092
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM

QTZ	9.59
C	0.00
ZR	0.00
OR	30.32
AB	33.17
AN	15.54
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	3.57
WO	0.00
HY	2.19
OL	0.00
CS	0.00
MT	2.35
CM	0.00
HM	0.00
IL	0.74
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.23
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.22
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.03
FE/FE+MG	0.42
OR+AB+AN	79.07
NE+LC+KP	0.00
AC+DI+HY*	5.76
OL+CS	0.00
MT+CM+HM	2.35
IL+SPH**	0.74
DIFF.IND.	73.07
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	38.35	37.39
AB+NE	41.95	43.40
AN	19.71	19.22
QTZ	31.85	72.41
NE	24.59	14.61
KP	23.53	12.98
CAO+BAO+SRO	31.54	38.72
NA2O	29.63	32.92
K2O+RB2O	38.80	28.35
MGO	5.01	10.63
ALK+RB2O	67.20	62.67
FE AS FEO	26.74	26.72
FE2/FE2+FE3	59.35	59.36

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.678

****CY78 **** #60206

	WT.PC	MOL.PC	MOL.PR
SIO2	59.59	59.95	0.9916
TIO2	0.37	0.28	0.0046
AL2O3	19.33	11.29	0.1896
FE2O3	2.74	1.03	0.0172
FEO	1.49	2.33	0.0436
MNO	0.33	0.29	0.0049
MGO	0.60	0.89	0.0149
CAO	2.02	2.14	0.0560
NA2O	4.33	4.16	0.0699
K2O	6.66	6.21	0.0707
H2O+	4.16	15.75	0.2309
H2O-	0.03	0.10	0.0033
P2O5	0.07	0.05	0.0005
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	103.71		
LESS O	0.00		
TOTAL	103.71		

	ATOMS
SI	51.128
TI	0.240
AL	19.027
FE3	1.776
FE2	2.514
MN	0.255
MG	0.770
CA	1.665
NA	7.231
K	7.320
OH	23.905
P	0.051
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	1.93
C	1.49
ZR	0.00
OR	39.36
AB	36.34
AN	8.56
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	5.68
OL	0.00
CS	0.00
MT	3.97
CM	0.00
HM	0.00
IL	0.70
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.17
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	4.16
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	103.71
FE/FE+MG	0.58
OR+AB+AN	85.56
NE+LC+KP	0.00
AC+DI+HY*	5.68
OL+CS	0.00
MT+CM+HM	3.97
IL+SPH**	0.70
DIFF.IND.	77.93
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	46.01	44.42
AB+NE	42.82	44.23
AN	11.13	10.99
QTZ	45.67	47.92
NE	25.45	15.94
KP	28.68	16.14
CAO+BAO+SRO	15.53	20.40
NA2O	33.23	39.56
K2O+R2O	51.19	40.04
MGO	3.35	6.12
ALK+R2O	61.41	57.73
FE AS FEO	35.23	36.10
FE2/FE2+FE3	60.90	60.93

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.741

****CY79 **** #60207

	WT.PC	MOL.PC	MOL.PR
SIO2	58.84	59.83	0.9791
TIO2	0.61	0.47	0.0078
AL2O3	19.59	11.62	0.1902
FE2O3	6.70	2.56	0.0419
FEO	0.16	0.14	0.0022
MNO	0.01	0.01	0.0002
MGO	0.39	0.58	0.0094
CAO	0.56	0.61	0.0108
NA2O	4.28	4.22	0.0680
K2O	9.58	5.57	0.0911
H2O+	4.24	14.38	0.2353
H2O-	0.00	0.00	0.0000
P2O5	0.04	0.02	0.0003
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	103.80		
LESS O	0.00		
TOTAL	103.80		

	ATOMS
SI	58.718
TI	0.592
AL	19.702
FE3	4.346
FE2	0.115
MN	0.007
MG	0.561
CA	0.517
NA	7.152
K	9.477
OH	24.382
P	0.029
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	9.00
C	2.12
ZR	0.00
OR	56.71
AB	35.91
AN	2.52
LC	0.00
NE	0.33
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	-0.00
OL	0.68
CS	0.00
MT	0.00
CM	0.00
HM	6.70
IL	0.36
SPH	0.00
PF	0.00
RU	0.42
AP	0.00
HAP	0.09
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	4.24
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	103.80
FE/FE+MG	0.00
OR+AB+AN	88.64
NE+LC+KP	0.33
AC+DI+HY*	-0.00
OL+CS	0.68
MT+CM+HM	6.70
IL+SPH**	0.78
DIFF.IND.	86.65
SI UNSAT.	0.57

RATIOS	WT.PC	MOL.PC
OR+LC+KP	56.87	55.32
AB+NE	40.30	41.93
AN	2.82	2.75
QTZ	44.10	66.51
NE	22.64	14.44
KP	33.26	19.05
CAO+BAO+SRO	4.17	5.87
NA2O	31.89	40.58
K2O+R2O	63.93	53.55
MGO	2.01	3.73
ALK+R2O	65.12	62.53
FE AS FEO	31.87	33.69
FE2/FE2+FE3	2.74	2.74

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.842

****CY80 **** #60208

	WT.PC	MOL.PC	MOL.PR
SIO2	59.91	65.93	0.9969
TIO2	0.95	0.79	0.0119
AL2O3	19.00	12.32	0.1363
FE2O3	1.73	0.72	0.0108
FEO	3.21	2.95	0.0447
MNO	0.06	0.06	0.0008
MGO	0.60	0.98	0.0149
CAO	0.66	0.78	0.0118
NA2O	3.45	3.68	0.0557
K2O	8.73	6.13	0.0927
H2O+	1.52	5.58	0.0844
H2O-	0.00	0.00	0.0000
P2O5	0.19	0.09	0.0013
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.01		
LESS O	0.00		
TOTAL	100.01		

	ATOMS
SI	54.612
TI	0.681
AL	20.417
FE3	1.187
FE2	2.447
MN	0.046
MG	0.315
CA	0.645
NA	6.097
K	10.154
OH	9.244
P	0.147
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	3.28
C	3.13
ZR	0.00
OR	51.60
AB	29.19
AN	2.03
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	4.50
OL	0.00
CS	0.00
MT	2.51
CM	0.00
HM	0.00
IL	1.60
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.45
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.51
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.01
FE/FE+MG	0.61
OR+AB+AN	82.82
NE+LC+KP	0.00
AC+DI+HY*	4.50
OL+CS	0.00
MT+CM+HM	2.51
IL+SPH**	1.60
DIFF.IND.	84.07
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	62.30	60.93
AB+NE	35.24	36.62
AN	2.45	2.40
QTZ	46.32	68.59
NE	16.81	11.79
KP	34.97	19.62
CAO+BAO+SRO	5.14	7.35
NA2O	26.87	34.76
K2O+R2O	67.99	57.89
MGO	3.41	6.46
ALK+R2O	69.13	64.33
FE AS FEO	27.41	29.16
FE2/FE2+FE3	67.75	67.75

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.797

****CY81 **** #60209

	WT.PC	MOL.PC	MOL.PR
SIO2	66.12	72.01	1.1003
TIO2	0.72	0.59	0.0093
AL2O3	19.27	12.37	0.1890
FE2O3	0.37	0.15	0.0023
FEO	0.10	0.09	0.0014
MNO	0.00	0.00	0.0000
MGO	0.16	0.26	0.0040
CAO	0.17	0.20	0.0030
NA2O	3.87	4.09	0.0624
K2O	9.66	6.71	0.1026
H2O+	0.97	3.52	0.0538
H2O-	0.00	0.00	0.0000
P2O5	0.01	0.00	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.42		
LESS O	0.00		
TOTAL	101.42		

	ATOMS
SI	58.291
TI	0.477
AL	20.026
FE3	0.245
FE2	0.074
MN	0.000
MG	0.210
CA	0.161
NA	6.615
K	10.867
OH	5.705
P	0.007
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	6.06
C	2.16
ZR	0.00
OR	57.10
AB	32.74
AN	0.78
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.40
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	0.37
IL	0.21
SPH	0.00
PF	0.00
RU	0.01
AP	0.00
HAP	0.02
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.97
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.42
FE/FE+MG	0.00
OR+AB+AN	90.62
NE+LC+KP	0.00
AC+DI+HY*	0.40
OL+CS	0.00
MT+CM+HM	0.37
IL+SPH**	0.42
DIFF.IND.	95.40
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	63.01	61.64
AB+NE	36.13	37.52
AN	0.86	0.84
QTZ	47.67	69.75
NE	18.50	11.45
KP	33.83	18.81
CAO+BAO+SRO	1.24	1.80
NA2O	28.25	37.16
K2O+R2O	70.51	61.04
MGO	1.13	2.27
ALK+R2O	95.80	94.29
FE AS FEO	3.07	3.44
FE2/FE2+FE3	23.10	23.10

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.873

****CY82 **** #60210

	WT.PC	MOL.PC	MOL.PR
SIO2	66.07	87.01	1.4332
TIO2	0.26	0.20	0.0033
AL2O3	7.33	4.37	0.0713
FE2O3	0.67	0.25	0.0042
FEO	0.16	0.14	0.0022
MNO	0.01	0.01	0.0001
MGO	0.47	0.71	0.0117
CAO	0.13	0.14	0.0023
NA2O	2.31	2.26	0.0373
K2O	1.25	0.79	0.0131
H2O+	1.21	4.08	0.0672
H2O-	0.00	0.00	0.0000
P2O5	0.05	0.02	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.90		
LESSO	0.00		
TOTAL	99.90		

	ATOMS
SI	70.941
TI	0.191
AL	7.113
ZR	0.000
OR	7.277
FE3	0.415
FE2	0.110
AB	19.556
AN	0.327
LC	0.000
NE	0.000
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	1.170
OL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.670
IL	0.360
SPH	0.000
PF	0.000
RU	0.070
AP	0.000
HAP	0.120
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	1.210
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	99.900
FE/FE+MG	0.000
OR+AB+AN	27.130
NE+LC+KP	0.000
AC+DI+HY*	1.170
OL+CS	0.000
MT+CM+HM	0.670
IL+SPH**	0.430
DIFF.IND.	93.900
SI UNSAT.	0.000
O	160.000

	CIPW NORM
QTZ	67.088
C	2.080
ZR	0.000
OR	7.277
AB	19.556
AN	0.000
LC	0.000
NE	0.000
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	1.170
OL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.360
SPH	0.000
PF	0.000
RU	0.070
AP	0.000
HAP	0.120
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	1.210
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	99.900
FE/FE+MG	0.000
OR+AB+AN	27.130
NE+LC+KP	0.000
AC+DI+HY*	1.170
OL+CS	0.000
MT+CM+HM	0.670
IL+SPH**	0.430
DIFF.IND.	93.900
SI UNSAT.	0.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	26.79	25.66
AB+NE	72.03	73.22
AN	1.17	1.12
QTZ	84.33	92.90
NE	11.26	5.25
KP	4.40	1.84
CAO+BAO+SRO	3.54	4.40
NA2O	62.94	70.79
K2O+R2O	33.51	24.81
O	9.83	16.03
ALK+R2O	74.01	69.18
FE AS FEO	16.16	14.79
FE2/FE2+FE3	22.00	22.01

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****CY83 **** #60211

	WT.PC	MOL.PC	MOL.PR
SIO2	56.41	68.24	1.0718
TIO2	0.43	0.31	0.0054
AL2O3	17.12	10.55	0.1679
FE2O3	2.42	0.93	0.0152
FEO	1.42	1.22	0.0194
MNO	0.12	0.10	0.0017
MGO	0.61	0.47	0.0077
CAO	4.17	4.53	0.0744
NA2O	5.06	5.03	0.0816
K2O	3.54	2.72	0.0179
H2O+	2.50	6.25	0.1353
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.66		
LESSO	0.00		
TOTAL	101.66		

	ATOMS
SI	55.647
TI	0.230
AL	17.496
FE3	1.579
FE2	1.050
MN	0.099
MG	0.481
CA	3.575
NA	8.506
K	3.917
OH	14.461
P	0.117
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	13.746
C	0.000
ZR	0.000
OR	20.923
AB	42.841
AN	13.556
LC	0.000
NE	0.000
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	1.389
WO	1.554
HY	0.000
OL	0.000
CS	0.000
MT	3.551
CM	0.000
HM	0.000
IL	0.475
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	2.500
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	101.66
FE/FE+MG	0.11
OR+AB+AN	77.29
NE+LC+KP	0.00
AC+DI+HY*	3.44
OL+CS	0.00
MT+CM+HM	3.51
IL+SPH**	0.82
DIFF.IND.	77.48
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	27.07	26.13
AB+NE	55.39	56.86
AN	17.53	16.96
QTZ	54.72	74.74
NE	29.93	17.29
KP	15.35	7.96
CAO+BAO+SRO	32.65	38.42
NA2O	39.62	42.17
K2O+R2O	27.72	19.42
MGO	2.45	4.33
ALK+R2O	68.11	66.72
FE AS FEO	29.44	28.97
FE2/FE2+FE3	41.43	41.45

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.710

****CY84 **** #60212

	WT.PC	MOL.PC	MOL.PR
SIO2	57.82	65.15	0.9621
TIO2	1.02	0.86	0.0128
AL2O3	18.27	12.12	0.1792
FE2O3	3.77	1.60	0.0236
FEO	2.61	2.64	0.0391
MNO	0.03	0.03	0.0004
MGO	0.65	1.09	0.0161
CAO	0.04	0.05	0.0007
NA2O	6.72	7.33	0.1084
K2O	7.15	5.13	0.0759
H2O+	1.09	4.09	0.0605
H2O-	0.00	0.00	0.0000
P2O5	0.02	0.01	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.39		
LESSO	0.00		
TOTAL	99.39		

	ATOMS
SI	53.325
TI	0.714
AL	20.048
FE3	2.641
FE2	2.163
MN	0.024
MG	0.962
CA	0.040
NA	12.128
K	8.493
OH	6.769
P	0.016
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.000
C	0.000
ZR	0.000
OR	42.260
AB	35.020
AN	0.000
LC	0.000
NE	10.370
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	2.370
NS	0.000
KS	0.000
DI	0.060
WO	0.000
HY	0.000
OL	1.960
CS	0.000
MT	4.280
CM	0.000
HM	0.000
IL	1.940
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.050
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	1.090
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	99.390
FE/FE+MG	0.340
OR+AB+AN	77.280
NE+LC+KP	10.370
AC+DI+HY*	2.420
OL+CS	1.960
MT+CM+HM	4.280
IL+SPH**	1.940
DIFF.IND.	87.660
SI UNSAT.	9.500

RATIOS	WT.PC	MOL.PC
OR+LC+KP	49.21	42.36
AB+NE	51.79	57.64
AN	0.00	0.00
QTZ	39.13	61.43
NE	33.46	22.23
KP	27.39	16.34
CAO+BAO+SRO	0.29	0.39
NA2O	48.31	58.59
K2O+R2O	51.40	41.03
MGO	3.13	5.61
ALK+R2O	66.84	64.13
FE AS FEO	30.03	30.21
FE2/FE2+FE3	45.57	45.57

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.028

****CY85A ****#60213

	WT.PC	MOL.PC	MOL.PR
SIO2	55.73	63.55	0.9282
TIO2	0.35	0.30	0.0044
AL2O3	20.15	13.53	0.1976
FE2O3	3.75	1.61	0.0235
FEO	0.74	0.71	0.0103
MNO	0.16	0.15	0.0023
MGO	0.20	0.34	0.0050
CAO	1.51	1.84	0.0269
NA2O	6.31	6.97	0.1018
K2O	10.31	7.49	0.1095
H2O+	0.92	3.50	0.0511
H2O-	0.00	0.00	0.0000
P2O5	0.02	0.01	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.20		
LESSO	0.00		
TOTAL	100.20		

	ATOMS
SI	52.368
TI	0.247
AL	22.300
FE3	2.650
FE2	0.531
MN	0.127
MG	0.230
CA	1.519
NA	11.485
K	12.351
OH	5.762
P	0.016
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.000
C	0.000
ZR	0.000
OR	60.940
AB	1.210
AN	0.000
LC	0.000
NE	24.400
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	6.220
NS	0.000
KS	0.000
DI	1.017
WO	2.500
HY	0.000
OL	0.000
CS	0.000
MT	1.388
CM	0.000
HM	0.227
IL	0.553
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	0.920
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	100.220
FE/FE+MG	0.000
OR+AB+AN	62.150
NE+LC+KP	24.400
AC+DI+HY*	9.737
OL+CS	0.000
MT+CM+HM	2.166
IL+SPH**	0.666
DIFF.IND.	86.550
SI UNSAT.	20.054

RATIOS	WT.PC	MOL.PC
OR+LC+KP	70.41	55.39
AB+NE	29.59	44.61
AN	0.00	0.00
QTZ	31.04	53.08
NE	28.95	20.93
KP	40.01	25.99
CAO+BAO+SRO	3.35	11.31
NA2O	54.80	42.74
K2O+R2O	36.87	45.96
MGO	0.95	1.90
ALK+R2O	78.77	76.61
FE AS FEO	20.26	21.59
FE2/FE2+FE3	21.06	21.09

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.069

****CY858 **** #60214

	WT.PC	MOL.PC	MOL.PR
SIO2	54.39	63.77	0.9134
TIO2	0.41	0.36	0.0051
AL2O3	19.62	13.56	0.1925
FE2O3	3.93	1.72	0.0246
FEO	0.75	0.73	0.0104
MNO	0.20	0.20	0.0024
MGO	0.25	0.45	0.0062
CAO	1.82	2.27	0.0325
NA2O	6.01	6.77	0.0969
K2O	10.09	7.43	0.1071
H2O+	0.73	2.35	0.0335
H2O-	0.00	0.00	0.0000
P2O5	0.06	0.03	0.0003
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O5	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.74		
LESS O	0.00		
TOTAL	98.74		

	ATOMS
SI	52.455
TI	0.295
AL	22.102
FE3	2.826
FE2	0.599
MN	0.162
MG	0.356
CA	1.864
NA	11.135
K	12.304
OH	4.654
P	0.012
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	59.64
AB	2.07
AN	0.00
LC	0.00
NE	21.12
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	5.33
NS	0.00
KS	0.00
DI	1.34
WO	2.94
HY	0.00
OL	0.00
CS	0.00
MT	1.88
CM	0.00
HM	0.77
IL	0.78
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.09
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.73
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.74
FE/FE+MG	0.00
OR+AB+AN	61.71
NE+LC+KP	23.12
AC+DI+HY*	9.66
OL+CS	0.00
MT+CM+HM	2.65
IL+SPH**	0.78
DIFF.IND.	84.82
SI UNSAT.	19.56

RATIOS	WT.PC	MOL.PC
OR+LC+KP	70.31	55.67
AB+NE	29.69	44.33
AN	0.00	0.00
QTZ	31.47	53.58
NE	28.53	20.58
KP	39.95	25.84
CAO+BAO+SRO	10.16	13.72
NA2O	33.54	40.99
K2O+RB2O	56.31	45.29
MGO	1.20	2.27
ALK+RB2O	77.27	74.32
FE AS FEO	21.53	22.91
FE2/FE2+FE3	21.18	21.22

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.060

****CY85C **** #60215

	WT.PC	MOL.PC	MOL.PR
SIO2	57.12	68.44	0.9505
TIO2	0.43	0.39	0.0054
AL2O3	20.96	14.87	0.2066
FE2O3	4.05	1.83	0.0254
FEO	0.71	0.74	0.0099
MNO	0.12	0.11	0.0017
MGO	0.28	0.49	0.0069
CAO	1.49	1.91	0.0263
NA2O	4.45	3.72	0.0479
K2O	9.68	6.59	0.1024
H2O+	2.09	2.55	0.1160
H2O-	0.00	0.00	0.0000
P2O5	0.03	0.01	0.0002
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	102.31		
LESS O	0.00		
TOTAL	102.31		

	ATOMS
SI	51.455
TI	0.291
AL	22.657
FE3	2.746
FE2	0.333
MN	0.092
MG	0.376
CA	1.362
NA	9.518
K	11.127
OH	12.560
P	0.023
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	57.21
AB	14.71
AN	4.14
LC	0.00
NE	17.01
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.55
WO	0.26
HY	0.00
OL	0.00
CS	0.00
MT	1.45
CM	0.90
HM	3.06
IL	0.42
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.07
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.09
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	102.31
FE/FE+MG	0.00
OR+AB+AN	76.06
NE+LC+KP	17.01
AC+DI+HY*	1.77
OL+CS	0.00
MT+CM+HM	4.49
IL+SPH**	0.32
DIFF.IND.	38.93
SI UNSAT.	14.39

RATIOS	WT.PC	MOL.PC
OR+LC+KP	61.47	51.87
AB+NE	34.03	44.37
AN	4.45	3.76
QTZ	35.36	57.94
NE	23.09	19.44
KP	36.56	22.72
CAO+BAO+SRO	8.41	11.50
NA2O	32.99	40.80
K2O+RB2O	58.60	47.70
MGO	1.41	2.67
ALK+RB2O	76.09	73.36
FE AS FEO	22.50	23.97
FE2/FE2+FE3	18.55	18.58

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.928

****CY86 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	59.01	64.30	0.9823
TIO2	0.51	0.30	0.0076
AL2O3	19.75	12.15	0.1839
FE2O3	3.11	1.29	0.0195
FEO	1.52	1.37	0.0207
MNO	0.06	0.05	0.0007
MGO	0.40	0.66	0.0099
CAO	0.35	0.41	0.0062
NA2O	3.19	3.40	0.0515
K2O	9.45	6.63	0.1003
H2O+	2.35	8.62	0.1304
H2O-	0.00	0.00	0.0000
P2O5	0.06	0.03	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.84		
LESS O	0.00		
TOTAL	98.84		

	ATOMS
SI	53.974
TI	0.419
AL	20.209
FE3	2.140
FE2	1.139
MN	0.039
MG	0.545
CA	0.343
NA	5.655
K	11.025
OH	14.335
P	0.046
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	3.12
C	0.00
ZR	0.00
OR	55.85
AB	26.99
AN	1.34
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	1.00
OL	0.00
CS	0.00
MT	3.20
CM	0.00
HM	0.90
IL	1.16
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.14
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.35
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.84
FE/FE+MG	0.00
OR+AB+AN	84.19
NE+LC+KP	0.00
AC+DI+HY*	1.00
OL+CS	0.00
MT+CM+HM	4.10
IL+SPH**	1.16
DIFF.IND.	85.97
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	66.34	65.06
AB+NE	32.06	33.37
AN	1.60	1.57
QTZ	46.08	68.47
NE	17.01	10.69
KP	36.92	20.84
CAO+BAO+SRO	2.69	3.95
NA2O	24.56	32.56
K2O+RB2O	72.75	63.49
MGO	2.30	4.47
ALK+RB2O	72.75	68.54
FE AS FEO	24.96	27.19
FE2/FE2+FE3	35.50	35.51

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.825

****CY862 **** #60216

	WT.PC	MOL.PC	MOL.PR
SIO2	60.00	67.19	0.9984
TIO2	0.50	0.51	0.0075
AL2O3	17.35	11.45	0.1702
FE2O3	3.40	1.43	0.0213
FEO	1.49	1.40	0.0207
MNO	0.05	0.05	0.0007
MGO	0.55	0.92	0.0136
CAO	0.35	0.42	0.0062
NA2O	2.73	2.96	0.0443
K2O	9.61	6.87	0.1029
H2O+	1.50	6.72	0.0999
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.06		
LESS O	0.00		
TOTAL	98.06		

	ATOMS
SI	55.523
TI	0.418
AL	18.926
FE3	2.366
FE2	1.153
MN	0.039
MG	0.759
CA	0.347
NA	4.988
K	11.347
OH	11.112
P	0.063
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	5.70
C	1.95
ZR	0.00
OR	56.80
AB	23.52
AN	1.21
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	1.37
OL	0.00
CS	0.00
MT	3.23
CM	0.00
HM	1.17
IL	1.14
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.19
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.50
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.06
FE/FE+MG	0.00
OR+AB+AN	81.53
NE+LC+KP	0.00
AC+DI+HY*	1.37
OL+CS	0.00
MT+CM+HM	4.40
IL+SPH**	1.14
DIFF.IND.	86.02
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	69.85	64.45
AB+NE	28.65	30.09
AN	1.49	1.46
QTZ	47.67	69.91
NE	14.81	9.19
KP	37.52	20.91
CAO+BAO+SRO	2.75	4.09
NA2O	21.82	29.29
K2O+RB2O	75.43	66.64
MGO	3.84	6.09
ALK+RB2O	70.85	65.41
FE AS FEO	26.22	28.51
FE2/FE2+FE3	33.44	33.49

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.863

****CY87 **** #60217

	WT.PC	MOL.PC	MOL.PR
SIO2	63.74	64.29	1.0607
TIO2	0.41	0.31	0.0051
AL2O3	17.03	10.12	0.1670
FE2O3	0.99	0.38	0.0062
FEO	3.29	2.78	0.0458
MNO	0.54	0.46	0.0076
MGO	0.79	1.19	0.0196
CAO	2.44	2.64	0.0435
NA2O	4.33	4.23	0.0698
K2O	4.15	2.67	0.0441
H2O+	3.23	10.37	0.1793
H2O-	0.00	0.00	0.0000
P2O5	0.14	0.06	0.0010
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.08		
LESSO	0.00		
TOTAL	101.08		

	ATOMS
SI	55.153
TI	0.328
AL	17.433
FE3	0.667
FE2	2.190
MN	0.397
MG	1.023
CA	2.271
NA	7.290
K	4.599
H	18.713
C	0.000
F	0.103
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	14.13
C	1.35
ZR	0.00
OR	24.53
AB	36.64
AN	11.19
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	7.51
OL	0.00
CS	0.00
MT	1.43
CM	0.00
HM	0.00
IL	0.78
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.33
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	3.22
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.08
FE/FE+MG	0.68
OR+AB+AN	72.36
NE+LC+KP	0.00
AC+DI+HY*	7.51
CL+CS	0.00
MT+CM+HM	1.43
IL+SPH**	0.78
DIFF.IND.	75.29
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	33.90	32.68
AB+NE	50.63	52.12
AN	15.47	15.01
QTZ	55.13	75.20
NE	26.36	15.21
KP	18.51	9.59
CAO+BAO+SRO	22.34	27.64
NA2O	39.65	44.37
K2O+RB2O	38.00	27.99
MGO	5.65	9.83
ALK+RB2O	60.61	57.15
FE AS FEO	33.74	33.02
FE2/FE2+FE3	81.13	81.16

* INCLUDES NS,KS,WO AND SPOO ** INCLUDES PF AND RU

A.I. 0.682

****CY88 **** #60218

	WT.PC	MOL.PC	MOL.PR
SIO2	67.21	70.76	1.1784
TIO2	0.34	0.36	0.0056
AL2O3	13.26	11.34	0.1793
FE2O3	1.71	0.68	0.0107
FEO	1.28	1.11	0.0175
MNO	0.02	0.02	0.0003
MGO	0.52	0.83	0.0129
CAO	1.47	1.66	0.0262
NA2O	4.16	4.25	0.0671
K2O	2.97	1.99	0.0315
H2O+	1.98	6.95	0.1099
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.19		
LESSO	0.00		
TOTAL	100.19		

	ATOMS
SI	57.827
TI	0.262
AL	18.572
FE3	1.109
FE2	0.908
MN	0.015
MG	0.668
CA	1.353
NA	6.941
K	3.266
OH	11.385
P	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	21.08
C	5.83
ZR	0.00
OR	17.55
AB	35.20
AN	6.25
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	1.49
OL	0.00
CS	0.00
MT	2.48
CM	0.00
HM	0.00
IL	0.85
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.58
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	1.97
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.19
FE/FE+MG	0.10
OR+AB+AN	59.00
NE+LC+KP	0.00
AC+DI+HY*	1.49
OL+CS	0.00
MT+CM+HM	2.48
IL+SPH**	0.85
DIFF.IND.	60.83
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	29.75	28.70
AB+NE	59.66	61.08
AN	10.59	10.22
QTZ	64.07	31.37
NE	23.59	12.07
KP	12.34	5.95
CAO+BAO+SRO	17.09	21.00
NA2O	43.37	53.75
K2O+RB2O	34.55	25.26
MGO	4.97	8.55
ALK+RB2O	63.11	65.42
FE AS FEO	26.92	26.02
FE2/FE2+FE3	45.41	45.42

* INCLUDES NS,KS,WO AND SPOO ** INCLUDES PF AND RU

A.I. 0.550

****CY89 **** #60219

	WT.PC	MOL.PC	MOL.PR
SIO2	65.42	68.86	1.0886
TIO2	0.37	0.29	0.0046
AL2O3	15.76	10.40	0.1644
FE2O3	1.58	0.63	0.0099
FEO	1.67	1.47	0.0232
MNO	0.24	0.21	0.0034
MGO	0.74	1.24	0.0196
CAO	3.29	3.71	0.0587
NA2O	4.37	4.46	0.0705
K2O	3.23	2.17	0.0343
H2O+	1.85	6.50	0.1027
H2O-	0.00	0.00	0.0000
P2O5	0.14	0.06	0.0010
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.71		
LESSO	0.00		
TOTAL	99.71		

	ATOMS
SI	57.549
TI	0.245
AL	17.390
FE3	1.046
FE2	1.229
MN	0.179
MG	1.036
CA	1.101
NA	7.453
K	3.326
OH	10.357
C	0.000
F	0.104
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	19.08
C	0.43
ZR	0.00
OR	19.09
AB	36.97
AN	15.41
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	3.56
OL	0.00
CS	0.00
MT	2.29
CM	0.00
HM	0.00
IL	0.70
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.33
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	1.84
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.71
FE/FE+MG	0.38
OR+AB+AN	71.47
NE+LC+KP	0.00
AC+DI+HY*	3.56
OL+CS	0.00
MT+CM+HM	2.29
IL+SPH**	0.70
DIFF.IND.	75.14
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	26.71	25.89
AB+NE	51.75	53.21
AN	21.56	20.90
QTZ	58.91	77.85
NE	26.66	14.92
KP	14.44	7.25
CAO+BAO+SRO	30.21	35.89
NA2O	40.13	43.13
K2O+RB2O	29.66	20.98
MGO	6.74	11.47
ALK+RB2O	64.84	61.35
FE AS FEO	28.42	27.18
FE2/FE2+FE3	57.35	57.37

* INCLUDES NS,KS,WO AND SPOO ** INCLUDES PF AND RU

A.I. 0.637

****CY90 **** #60220

	WT.PC	MOL.PC	MOL.PR
SIO2	63.39	63.33	1.0543
TIO2	0.35	0.29	0.0043
AL2O3	16.54	9.34	0.1522
FE2O3	1.67	0.63	0.0105
FEO	1.36	1.37	0.0239
MNO	0.12	0.10	0.0017
MGO	0.96	1.44	0.0235
CAO	4.05	4.33	0.0722
NA2O	6.34	6.25	0.1023
K2O	3.24	2.09	0.0344
H2O+	2.79	9.39	0.1549
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.50		
LESSO	0.00		
TOTAL	101.50		

	ATOMS
SI	55.191
TI	0.249
AL	16.975
FE3	1.094
FE2	1.354
MN	0.039
MG	1.246
CA	3.779
NA	10.792
K	3.600
OH	16.205
P	0.118
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	6.29
C	0.00
ZR	0.00
OR	19.15
AB	53.54
AN	7.11
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	8.22
WO	0.78
HY	0.00
OL	0.00
CS	0.00
MT	2.42
CM	0.00
HM	0.00
IL	0.72
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.58
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	2.79
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.50
FE/FE+MG	0.34
OR+AB+AN	79.90
NE+LC+KP	0.00
AC+DI+HY*	9.01
OL+CS	0.00
MT+CM+HM	2.42
IL+SPH**	0.72
DIFF.IND.	79.01
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	23.97	23.02
AB+NE	67.13	68.43
AN	8.90	8.55
QTZ	49.49	70.44
NE	36.73	22.12
KP	13.76	7.44
CAO+BAO+SRO	29.71	34.57
NA2O	56.52	68.96
K2O+RB2O	23.77	16.47
MGO	6.85	11.39
ALK+RB2O	64.32	65.40
FE AS FEO	24.84	23.21
FE2/FE2+FE3	56.83	56.87

* INCLUDES NS,KS,WO AND SPOO ** INCLUDES PF AND RU

A.I. 0.843

****CY91 **** #60221

	WT.PC	MOL.PC	MOL.PR
SIO2	55.27	59.07	0.9197
TIO2	0.40	0.34	0.0100
AL203	16.66	10.49	0.1634
FE203	2.23	0.92	0.0143
FEO	5.52	4.75	0.0740
MNO	0.19	0.17	0.0027
MGO	2.06	3.25	0.0506
CAO	5.15	5.90	0.0918
NA2O	4.47	4.63	0.0721
K2O	6.75	4.60	0.0717
H2O+	1.50	5.35	0.0833
H2O-	0.00	0.00	0.0000
P2O5	0.49	0.22	0.0035
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.92		
LESSO	0.00		
TOTAL	100.92		

	ATOMS
SI	51.526
C	0.381
AL	18.308
FE3	1.630
FE2	4.148
MN	0.150
MG	2.835
CA	5.145
NA	8.079
K	5.050
OH	9.329
F	0.337
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	52.71	46.66
AB+NE	40.07	46.95
AN	7.22	6.39
QTZ	38.54	61.03
NE	29.13	19.54
KP	32.23	19.42
CAO+BAO+SRO	31.46	38.93
NA2O	27.31	30.60
K2O+RB2O	41.23	30.42
MGO	9.80	16.89
ALK+RB2O	53.69	47.93
FE AS FEO	36.32	35.13
FE2/FE2+FE3	72.87	72.88

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	35.90
AB	21.47
AN	5.46
LC	0.00
NE	8.88
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	14.12
WO	0.00
HY	0.00
OL	3.66
CS	0.00
MT	3.31
CM	0.00
HM	0.00
IL	1.52
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	1.16
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.48
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.92
FE/FE+MG	0.51
OR+AB+AN	66.83
NE+LC+KP	8.86
AC+DI+HY*	14.12
OL+CS	3.66
MT+CM+HM	3.31
IL+SPH**	1.52
DIFF.IND.	70.22
SI UNSAT.	6.77

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.880

****CY92 **** #60222

	WT.PC	MOL.PC	MOL.PR
SIO2	63.10	62.29	1.0533
TIO2	0.12	0.10	0.0015
AL2O3	19.66	12.79	0.1930
FE2O3	1.47	0.91	0.0092
FEO	0.42	0.33	0.0058
MNO	0.15	0.12	0.0018
MGO	0.29	0.47	0.0072
CAO	1.59	1.01	0.0243
NA2O	5.42	6.13	0.0933
K2O	6.12	4.27	0.0650
H2O+	1.16	4.24	0.0644
H2O-	0.00	0.00	0.0000
P2O5	0.03	0.01	0.0002
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.93		
LESSO	0.00		
TOTAL	99.93		

	ATOMS
SI	56.549
C	0.031
AL	20.725
FE3	0.938
FE2	0.114
MN	0.018
MG	0.386
CA	1.231
NA	10.680
K	6.976
OH	0.913
P	0.023
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	39.27	38.02
AB+NE	53.46	54.93
AN	7.27	7.05
QTZ	46.40	68.16
NE	30.23	18.81
KP	23.33	13.02
CAO+BAO+SRO	10.43	13.50
NA2O	43.65	51.12
K2O+RB2O	45.91	35.38
MGO	2.05	3.74
ALK+RB2O	34.66	82.68
FE AS FEO	13.23	13.59
FE2/FE2+FE3	29.37	29.43

CIPW NORM	
QTZ	2.70
C	1.01
ZR	0.00
OR	36.17
AB	49.46
AN	6.70
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.72
OL	0.00
CS	0.00
MT	1.43
CM	0.00
HM	0.48
IL	0.23
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.07
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.16
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.93
FE/FE+MG	0.00
OR+AB+AN	92.11
NE+LC+KP	0.00
AC+DI+HY*	0.72
OL+CS	0.00
MT+CM+HM	1.91
IL+SPH**	0.23
DIFF.IND.	88.11
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.823

****CY94 **** #60223

	WT.PC	MOL.PC	MOL.PR
SIO2	55.40	62.17	0.9219
TIO2	0.27	0.23	0.0034
AL2O3	20.05	13.26	0.1966
FE2O3	2.05	0.87	0.0128
FEO	0.56	0.53	0.0078
MNO	0.13	0.12	0.0018
MGO	0.56	0.94	0.0079
CAO	3.46	4.15	0.0615
NA2O	6.23	6.78	0.1005
K2O	7.39	5.29	0.0735
H2O+	1.61	6.03	0.0894
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	97.55		
LESSO	0.00		
TOTAL	97.55		

	ATOMS
SI	52.189
TI	0.191
AL	22.239
FE3	1.452
FE2	0.441
MN	0.104
MG	0.449
CA	3.479
NA	11.365
K	8.873
OH	10.107
P	0.092
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	50.16	41.79
AB+NE	44.19	53.51
AN	5.65	4.71
QTZ	35.03	57.23
NE	34.76	24.02
KP	30.21	18.75
CAO+BAO+SRO	20.21	25.58
NA2O	36.50	41.79
K2O+RB2O	43.29	32.63
MGO	1.94	3.57
ALK+RB2O	82.67	80.54
FE AS FEO	15.33	15.89
FE2/FE2+FE3	27.22	27.27

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	43.68
AB	21.65
AN	4.92
LC	0.00
NE	16.83
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.72
WO	3.92
HY	0.00
OL	0.00
CS	0.00
MT	1.45
CM	0.00
HM	1.05
IL	0.51
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.61
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	97.55
FE/FE+MG	0.00
OR+AB+AN	70.25
NE+LC+KP	16.83
AC+DI+HY*	5.64
OL+CS	0.00
MT+CM+HM	2.50
IL+SPH**	0.51
DIFF.IND.	82.16
SI UNSAT.	14.23

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.910

****CY942 **** #60223

	WT.PC	MOL.PC	MOL.PR
SIO2	56.41	62.62	0.9387
TIO2	0.27	0.23	0.0034
AL2O3	20.42	13.36	0.2003
FE2O3	2.16	0.90	0.0135
FEO	0.56	0.52	0.0078
MNO	0.13	0.12	0.0018
MGO	0.50	0.83	0.0124
CAO	3.36	4.00	0.0599
NA2O	6.33	6.81	0.1021
K2O	7.17	5.08	0.0761
H2O+	1.48	5.48	0.0821
H2O-	0.00	0.00	0.0000
P2O5	0.11	0.05	0.0008
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.90		
LESSO	0.00		
TOTAL	98.90		

	ATOMS
SI	52.299
TI	0.188
AL	22.317
FE3	1.507
FE2	0.434
MN	0.102
MG	0.691
CA	3.373
NA	11.378
K	8.482
OH	9.156
P	0.086
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	47.73	40.22
AB+NE	45.31	53.95
AN	6.92	5.82
QTZ	35.70	57.91
NE	35.14	24.11
KP	29.16	17.98
CAO+BAO+SRO	19.95	25.16
NA2O	37.54	42.84
K2O+RB2O	42.53	31.96
MGO	3.01	5.46
ALK+RB2O	81.16	78.41
FE AS FEO	15.83	16.14
FE2/FE2+FE3	26.20	26.25

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	42.38
AB	24.39
AN	6.13
LC	0.00
NE	15.50
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	2.89
WO	2.66
HY	0.00
OL	0.00
CS	0.00
MT	1.45
CM	0.00
HM	1.16
IL	0.51
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.26
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.48
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.90
FE/FE+MG	0.00
OR+AB+AN	72.90
NE+LC+KP	15.80
AC+DI+HY*	5.34
OL+CS	0.00
MT+CM+HM	2.61
IL+SPH**	0.91
DIFF.IND.	82.57
SI UNSAT.	13.57

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.890

****Cy95 **** #60224

	WT.PC	MOL.PC	MOL.PR
SIO2	60.49	66.43	1.0066
TIO2	0.33	0.23	0.0041
AL2O3	20.52	13.29	0.2013
FE2O3	3.07	1.81	0.0192
FEO	0.32	0.31	0.0031
MNO	0.05	0.05	0.0007
MGO	0.34	0.57	0.0094
CAO	0.32	0.37	0.0057
NA2O	4.43	4.86	0.0715
K2O	7.75	5.61	0.0525
H2O+	1.20	4.35	0.0665
H2O-	0.00	0.00	0.0000
P2O5	0.06	0.03	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.73		
LESS O	0.00		
TOTAL	98.73		

	ATOMS
SI	55.094
TI	0.226
AL	22.031
FE3	2.104
FE2	0.158
MN	0.039
MG	0.462
CA	0.312
NA	7.822
K	9.807
OH	7.291
	0.000
	0.000
P	0.046
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	4.03
C	4.41
ZR	0.00
OR	45.81
AB	37.43
AN	1.20
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.30
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.85
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	3.07
IL	0.57
SPH	0.00
PF	0.00
RU	0.03
AP	0.00
HAP	0.14
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.20
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.78
FE/FE+MG	0.00
OR+AB+AN	84.48
NE+LC+KP	0.00
AC+DI+HY*	0.85
OL+CS	0.00
MT+CM+HM	3.07
IL+SPH**	0.60
DIFF.IND.	87.32
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	54.22	52.73
AB+NE	44.37	45.84
AN	1.42	1.33
QTZ	46.94	68.93
NE	23.25	14.44
KP	29.81	16.63
CAO+BAO+SRO	2.56	3.58
NA2O	35.44	44.82
K2O+RB2O	62.00	51.60
MGO	2.19	4.13
ALK+RB2O	78.32	75.22
FE AS FEO	19.50	20.65
FE2/FE2+FE3	8.90	8.92

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.764

****Cy96 **** #60225

	WT.PC	MOL.PC	MOL.PR
SIO2	62.85	66.12	1.0465
TIO2	0.45	0.36	0.0054
AL2O3	14.37	11.43	0.1802
FE2O3	2.98	1.18	0.0187
FEO	0.61	0.54	0.0085
MNO	0.05	0.04	0.0007
MGO	1.19	1.87	0.0295
CAO	4.22	4.31	0.0768
NA2O	6.01	6.12	0.0969
K2O	2.24	1.51	0.0158
H2O+	1.59	5.50	0.0885
H2O-	0.00	0.00	0.0000
P2O5	0.21	0.09	0.0015
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.32		
LESS O	0.00		
TOTAL	100.32		

	ATOMS
SI	55.240
TI	0.284
AL	19.021
FE3	1.970
FE2	0.443
MN	0.037
MG	1.553
CA	4.000
NA	10.335
K	2.511
OH	9.317
	0.000
P	0.156
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	9.76
C	0.00
ZR	0.00
OR	13.24
AB	50.52
AN	16.54
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	2.47
WO	0.00
HY	1.82
OL	0.00
CS	0.00
MT	0.48
CM	0.00
HM	2.37
IL	0.32
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.58
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.82
FE/FE+MG	0.00
OR+AB+AN	80.63
NE+LC+KP	0.00
AC+DI+HY*	4.29
OL+CS	0.00
MT+CM+HM	3.25
IL+SPH**	0.62
DIFF.IND.	73.65
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	16.42	15.81
AB+NE	63.07	64.44
AN	20.51	19.76
QTZ	52.51	72.77
NE	37.33	21.67
KP	10.19	5.36
CAO+BAO+SRO	34.00	38.57
NA2O	48.08	49.33
K2O+RB2O	17.92	12.10
MGO	9.31	15.00
ALK+RB2O	64.55	61.36
FE AS FEO	25.14	23.64
FE2/FE2+FE3	19.75	19.77

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.670

****Cy97 **** #60226

	WT.PC	MOL.PC	MOL.PR
SIO2	62.91	70.75	1.0463
TIO2	0.20	0.17	0.0025
AL2O3	19.43	12.88	0.1906
FE2O3	2.77	1.17	0.0173
FEO	0.46	0.43	0.0064
MNO	0.05	0.05	0.0007
MGO	0.32	0.54	0.0079
CAO	0.84	1.01	0.0150
NA2O	4.44	4.84	0.0716
K2O	8.51	6.11	0.0903
H2O+	0.54	2.03	0.0300
H2O-	0.00	0.00	0.0000
P2O5	0.05	0.02	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.52		
LESS O	0.00		
TOTAL	100.52		

	ATOMS
SI	56.852
TI	0.156
AL	20.698
FE3	1.934
FE2	0.348
MN	0.038
MG	0.831
CA	0.813
NA	7.779
K	9.813
OH	3.256
	0.000
P	0.038
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	2.37
C	1.51
ZR	0.00
OR	50.30
AB	37.57
AN	3.84
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.80
OL	0.00
CS	0.00
MT	1.07
CM	0.00
HM	2.03
IL	0.38
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.12
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.54
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.52
FE/FE+MG	0.00
OR+AB+AN	91.71
NE+LC+KP	0.00
AC+DI+HY*	0.80
OL+CS	0.00
MT+CM+HM	3.10
IL+SPH**	0.38
DIFF.IND.	90.24
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	54.89	53.50
AB+NE	40.99	42.41
AN	4.17	4.09
QTZ	45.73	67.97
NE	22.53	14.16
KP	31.67	17.87
CAO+BAO+SRO	6.09	8.47
NA2O	52.20	60.48
K2O+RB2O	61.71	51.06
MGO	1.97	3.75
ALK+RB2O	79.53	76.51
FE AS FEO	18.49	19.74
FE2/FE2+FE3	16.99	17.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.849

****Cy98 **** #60227

	WT.PC	MOL.PC	MOL.PR
SIO2	55.32	58.90	0.9205
TIO2	0.90	0.72	0.0113
AL2O3	18.02	11.31	0.1767
FE2O3	4.44	1.78	0.0278
FEO	2.07	1.84	0.0283
MNO	0.12	0.11	0.0017
MGO	1.17	1.86	0.0290
CAO	1.46	1.67	0.0260
NA2O	2.61	2.69	0.0421
K2O	9.05	6.15	0.0961
H2O+	3.63	12.39	0.2015
H2O-	0.00	0.00	0.0000
P2O5	0.15	0.09	0.0013
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.96		
LESS O	0.00		
TOTAL	98.96		

	ATOMS
SI	50.629
TI	0.620
AL	19.441
FE3	3.058
FE2	1.585
MN	0.093
MG	1.596
CA	1.432
NA	4.673
K	10.569
OH	22.163
	0.000
P	0.147
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	1.16
C	1.73
ZR	0.00
OR	53.49
AB	22.98
AN	6.00
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	2.91
OL	0.00
CS	0.00
MT	4.45
CM	0.00
HM	1.37
IL	1.71
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.45
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	3.62
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.98
FE/FE+MG	0.00
OR+AB+AN	81.58
NE+LC+KP	0.00
AC+DI+HY*	2.91
OL+CS	0.00
MT+CM+HM	5.82
IL+SPH**	1.71
DIFF.IND.	76.73
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	65.57	64.50
AB+NE	27.07	28.26
AN	7.36	7.24
QTZ	44.80	67.42
NE	15.59	9.93
KP	39.61	22.65
CAO+BAO+SRO	11.13	15.85
NA2O	19.89	25.64
K2O+RB2O	68.98	58.51
MGO	6.15	11.46
ALK+RB2O	61.32	54.55
FE AS FEO	32.53	33.99
FE2/FE2+FE3	35.41	35.42

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.782

****CY99 **** #60228

	WT.PC	MOL.PC	MOL.PR
SIO2	65.20	69.31	1.0959
TIO2	0.63	0.50	0.0054
AL2O3	19.02	11.96	0.1867
FE2O3	2.80	1.87	0.0163
FEO	0.44	0.27	0.0038
MNO	0.11	0.11	0.0001
MGO	0.33	0.32	0.0082
CAO	1.43	1.63	0.0291
NA2O	4.33	4.75	0.0774
K2O	3.03	2.35	0.0417
H2O+	2.16	7.39	0.1210
H2O-	0.00	0.00	0.0000
P2O5	0.19	0.07	0.0013
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.46		
LESSO	0.00		
TOTAL	100.46		

	ATOMS
SI	56.496
TI	0.380
AL	19.410
FE3	1.644
FE2	0.619
MN	0.087
MG	0.426
CA	1.252
NA	3.197
K	4.341
OH	12.590
	0.000
P	0.139
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	19.27
C	4.82
ZR	0.00
OR	23.23
AB	40.57
AN	5.46
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.32
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	2.60
IL	0.72
SPH	0.00
PF	0.00
RU	0.05
AP	0.00
HAP	0.45
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.17
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.46
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	33.40	32.23
AB+NE	56.76	60.19
AN	7.83	7.58
QTZ	37.61	76.96
NE	26.55	15.00
KP	15.83	8.03
CAO+BAO+SRO	13.35	16.75
NA2O	47.77	54.22
K2O+RB2O	38.87	29.03
MGO	2.80	4.96
ALK+RB2O	74.43	72.46
FE AS FEO	22.77	22.59
FE2/FE2+FE3	12.69	12.69

OR+AB+AN	69.55
NE+LC+KP	0.00
AC+DI+HY*	0.32
OL+CS	0.00
MT+CM+HM	2.60
IL+SPH**	0.77
DIFF.IND.	83.37
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.641

****CY101 ****#60229

	WT.PC	MOL.PC	MOL.PR
SIO2	51.15	54.10	0.8512
TIO2	1.12	0.92	0.0144
AL2O3	13.71	8.53	0.1345
FE2O3	4.56	1.32	0.0206
FEO	4.18	3.39	0.0510
MNO	0.17	0.15	0.0024
MGO	3.86	6.08	0.0957
CAO	9.00	10.34	0.1605
NA2O	1.84	1.39	0.0297
K2O	5.31	4.61	0.0723
H2O+	2.03	7.19	0.1127
H2O-	0.00	0.00	0.0000
P2O5	0.66	0.30	0.0046
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.32		
LESSO	0.00		
TOTAL	99.32		

	ATOMS
SI	49.029
TI	0.729
AL	15.491
FE3	3.290
FE2	3.512
MN	0.138
MG	5.515
CA	9.244
NA	3.419
K	8.329
OH	12.981
	0.000
P	0.536
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	40.25
AB	6.88
AN	9.04
LC	0.00
NE	3.73
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	24.99
WO	0.00
HY	0.00
OL	0.28
CS	0.00
MT	6.61
CM	0.00
HM	0.00
IL	2.18
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	1.56
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.00
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.32
FE/FE+MG	0.18

RATIOS	WT.PC	MOL.PC
OR+LC+KP	65.24	61.16
AB+NE	20.12	25.11
AN	14.65	13.74
QTZ	40.56	63.54
NE	16.01	10.61
KP	43.43	25.85
CAO+BAO+SRO	50.99	61.15
NA2O	10.42	11.31
K2O+RB2O	38.53	27.55
MGO	18.24	30.09
ALK+RB2O	40.97	32.05
FE AS FEO	40.39	37.36
FE2/FE2+FE3	52.53	52.59

OR+AB+AN	57.97
NE+LC+KP	3.73
AC+DI+HY*	24.99
OL+CS	0.28
MT+CM+HM	6.61
IL+SPH**	2.18
DIFF.IND.	52.66
SI UNSAT.	3.27

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.758

****CY102GLK**** #60230

	WT.PC	MOL.PC	MOL.PR
SIO2	56.56	60.88	0.9417
TIO2	0.31	0.25	0.0039
AL2O3	18.26	11.58	0.1791
FE2O3	2.33	0.94	0.0146
FEO	2.20	1.98	0.0306
MNO	0.13	0.12	0.0018
MGO	2.17	3.48	0.0538
CAO	4.60	5.30	0.0820
NA2O	5.55	5.79	0.0895
K2O	5.33	3.66	0.0566
H2O+	1.67	5.99	0.0927
H2O-	0.00	0.00	0.0000
P2O5	0.07	0.03	0.0005
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.21		
LESSO	0.00		
TOTAL	99.21		

	ATOMS
SI	52.284
TI	0.215
AL	19.887
FE3	1.620
FE2	1.700
MN	0.102
MG	2.985
CA	4.554
NA	9.941
K	6.284
OH	10.293
	0.000
P	0.055
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	31.50
AB	33.06
AN	9.18
LC	0.00
NE	7.53
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	10.57
WO	0.00
HY	0.00
OL	1.57
CS	0.00
MT	3.38
CM	0.00
HM	0.00
IL	0.59
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.17
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.67
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.21
FE/FE+MG	0.21

RATIOS	WT.PC	MOL.PC
OR+LC+KP	38.76	34.80
AB+NE	49.95	55.06
AN	11.29	10.14
QTZ	39.89	62.03
NE	35.29	23.23
KP	24.83	14.68
CAO+BAO+SRO	29.72	35.95
NA2O	35.85	39.24
K2O+RB2O	34.43	24.80
MGO	12.42	20.58
ALK+RB2O	62.25	55.86
FE AS FEO	25.33	23.56
FE2/FE2+FE3	52.64	52.65

OR+AB+AN	73.74
NE+LC+KP	7.53
AC+DI+HY*	10.57
OL+CS	1.57
MT+CM+HM	3.38
IL+SPH**	0.59
DIFF.IND.	72.09
SI UNSAT.	6.98

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.816

****CY102WHT**** #60230

	WT.PC	MOL.PC	MOL.PR
SIO2	52.89	63.72	1.0465
TIO2	0.22	0.13	0.0023
AL2O3	18.81	12.11	0.1845
FE2O3	1.35	0.56	0.0035
FEO	0.78	0.71	0.0109
MNO	0.03	0.03	0.0004
MGO	0.51	0.33	0.0125
CAO	1.62	1.99	0.0259
NA2O	4.55	4.42	0.0734
K2O	8.43	5.33	0.0895
H2O+	1.16	4.23	0.0644
H2O-	0.09	0.00	0.0000
P2O5	0.05	0.03	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.42		
LESSO	0.00		
TOTAL	100.42		

	ATOMS
SI	56.573
TI	0.149
AL	19.946
FE3	0.921
FE2	0.537
MN	0.023
MG	0.684
CA	1.562
NA	7.935
K	9.676
OH	6.961
	0.000
P	0.046
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.45
C	0.00
ZR	0.00
OR	49.83
AB	38.50
AN	6.01
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	4.28
WO	0.00
HY	0.58
OL	0.00
CS	0.00
MT	1.97
CM	0.00
HM	0.00
IL	0.42
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.14
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.16
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.42
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	52.82	51.53
AB+NE	40.61	42.26
AN	6.37	6.22
QTZ	44.61	66.92
NE	23.49	14.91
KP	51.89	18.19
CAO+BAO+SRO	11.10	15.06
NA2O	31.16	38.27
K2O+RB2O	57.74	46.67
MGO	3.27	6.29
ALK+RB2O	33.61	79.71
FE AS FEO	13.13	13.89
FE2/FE2+FE3	59.65	59.84

OR+AB+AN	94.33
NE+LC+KP	0.00
AC+DI+HY*	1.75
OL+CS	0.00
MT+CM+HM	1.97
IL+SPH**	0.42
DIFF.IND.	96.77
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.883

****CY103 **** #60231

	WT.PC	MOL.PC	MOL.PR
SIO2	62.21	66.21	1.0352
TIO2	0.56	0.45	0.0056
AL2O3	17.04	10.80	0.1671
FE2O3	1.42	0.57	0.0089
FEO	1.75	1.57	0.0244
MNO	0.11	0.10	0.0016
MGO	0.76	1.22	0.0188
CAO	4.10	4.73	0.0751
NA2O	5.15	5.37	0.0831
K2O	4.46	3.06	0.0474
H2O+	1.47	5.27	0.0816
H2O-	0.00	0.00	0.0000
P2O5	0.15	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.01		
LESS O	0.00		
TOTAL	99.01		

	ATOMS
SI	56.273
TI	0.265
AL	18.170
FE3	0.967
FE2	1.524
MN	0.085
MG	1.025
CA	3.974
NA	3.932
K	3.149
H	5.571
C	0.000
P	0.115
S	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
O	160.000

CIPW NORM	
QTZ	6.93
C	0.00
ZR	0.00
OR	26.56
AB	43.57
AN	10.21
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	7.09
WO	0.22
HY	0.00
OL	0.00
CS	0.00
MT	2.06
CM	0.00
HM	0.00
IL	0.74
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.35
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.46
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.01
FE/FE+MG	0.39
OR+AB+AN	80.15
NE+LC+KP	0.00
AC+DI+HY*	7.31
OL+CS	0.00
MT+CM+HM	2.06
IL+SPH**	0.74
DIFF.IND.	76.87
SI UNSAT.	0.00
FE2/FE2+FE3	9.66

RATIOS	WT.PC	MOL.PC
OR+LC+KP	32.89	31.83
AB+NE	54.37	55.84
AN	12.74	12.33
QTZ	49.31	70.95
NE	30.71	18.50
KP	19.49	10.55
CAO+BAO+SRO	29.91	35.92
NA2O	37.56	40.82
K2O+RB2O	32.53	23.25
MG	5.63	9.77
ALK+RB2O	71.14	67.59
FE AS FEO	23.23	22.64
FE2/FE2+FE3	59.26	59.30

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.781

****CY104 **** #60232

	WT.PC	MOL.PC	MOL.PR
SIO2	55.30	61.27	0.9202
TIO2	0.40	0.34	0.0050
AL2O3	20.59	13.62	0.2019
FE2O3	5.30	2.24	0.0332
FEO	0.50	0.54	0.0076
MNO	0.11	0.10	0.0016
MGO	0.41	0.69	0.0103
CAO	3.37	4.05	0.0601
NA2O	2.16	2.55	0.0344
K2O	9.26	6.65	0.0985
H2O+	2.00	7.49	0.1113
H2O-	0.00	0.00	0.0000
P2O5	0.07	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.39		
LESS O	0.00		
TOTAL	99.39		

	ATOMS
SI	51.113
TI	0.272
AL	22.434
FE3	3.687
FE2	0.309
MN	0.046
MG	0.565
CA	3.332
NA	3.871
K	10.921
OH	12.332
P	0.030
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.20
C	0.10
ZR	0.00
OR	54.73
AB	17.28
AN	16.13
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.05
OL	0.68
CS	0.00
MT	0.49
CM	0.00
HM	4.96
IL	0.76
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.00
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.39
FE/FE+MG	0.00
OR+AB+AN	89.14
NE+LC+KP	0.00
AC+DI+HY*	0.05
OL+CS	0.68
MT+CM+HM	5.45
IL+SPH**	0.76
DIFF.IND.	73.01
SI UNSAT.	0.29

RATIOS	WT.PC	MOL.PC
OR+LC+KP	91.43	60.63
AB+NE	20.50	21.49
AN	18.10	17.88
QTZ	43.86	66.67
NE	13.56	8.72
KP	42.60	24.61
CAO+BAO+SRO	22.79	31.10
NA2O	14.60	18.03
K2O+RB2O	62.61	50.87
MG	2.63	4.69
ALK+RB2O	66.75	61.41
FE AS FEO	30.63	33.90
FE2/FE2+FE3	9.66	9.69

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****CY105 **** #60233

	WT.PC	MOL.PC	MOL.PR
SIO2	54.42	55.61	0.9056
TIO2	0.54	0.42	0.0068
AL2O3	14.76	8.89	0.1448
FE2O3	1.38	0.53	0.0086
FEO	5.31	4.97	0.0809
MNO	0.16	0.14	0.0023
MGO	5.46	8.35	0.1359
CAO	10.10	11.06	0.1801
NA2O	3.72	3.68	0.0600
K2O	2.92	1.94	0.0316
H2O+	1.28	4.36	0.0710
H2O-	0.00	0.00	0.0000
P2O5	0.12	0.05	0.0008
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.75		
LESS O	0.00		
TOTAL	100.75		

	ATOMS
SI	50.923
TI	0.379
AL	16.249
FE3	0.770
FE2	4.338
MN	0.127
MG	7.628
CA	10.108
NA	6.735
K	3.551
OH	7.975
F	0.095
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	17.61
AB	26.41
AN	14.78
LC	0.00
NE	2.74
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	28.19
WO	0.00
HY	0.00
OL	6.42
CS	0.00
MT	2.00
CM	0.00
HM	0.00
IL	1.03
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.28
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.27
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.75
FE/FE+MG	0.33
OR+AB+AN	58.81
NE+LC+KP	2.74
AC+DI+HY*	28.19
OL+CS	6.42
MT+CM+HM	2.00
IL+SPH**	1.03
DIFF.IND.	46.77
SI UNSAT.	4.71

RATIOS	WT.PC	MOL.PC
OR+LC+KP	28.62	26.77
AB+NE	47.37	50.77
AN	24.01	22.47
QTZ	42.14	64.15
NE	36.46	23.47
KP	21.40	12.38
CAO+BAO+SRO	60.12	66.28
NA2O	22.14	22.08
K2O+RB2O	17.74	11.64
MGO	23.26	41.44
ALK+RB2O	34.52	27.94
FE AS FEO	37.19	30.61
FE2/FE2+FE3	82.76	82.79

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****CY106 **** #60234

	WT.PC	MOL.PC	MOL.PR
SIO2	57.94	61.53	0.9641
TIO2	0.17	0.14	0.0021
AL2O3	20.37	12.75	0.1998
FE2O3	2.97	1.19	0.0186
FEO	0.69	0.61	0.0095
MNO	0.05	0.04	0.0007
MGO	0.22	0.35	0.0055
CAO	2.67	3.04	0.0476
NA2O	2.63	2.76	0.0432
K2O	9.64	6.53	0.1023
H2O+	3.12	11.05	0.1732
H2O-	0.00	0.00	0.0000
P2O5	0.04	0.02	0.0003
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.09	0.03	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.56		
LESS O	0.00		
TOTAL	100.56		

	ATOMS
SI	51.919
TI	0.115
AL	21.517
FE3	2.003
FE2	0.517
MN	0.038
MG	0.294
CA	2.564
NA	4.656
K	11.022
OH	18.651
P	0.030
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.33
C	0.77
ZR	0.00
OR	56.95
AB	21.97
AN	12.99
LC	0.00
NE	0.33
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.00
OL	0.33
CS	0.00
MT	1.59
CM	0.00
HM	1.66
IL	0.32
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.09
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	3.12
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.56
FE/FE+MG	0.00
OR+AB+AN	91.93
NE+LC+KP	0.33
AC+DI+HY*	0.00
OL+CS	0.33
MT+CM+HM	3.56
IL+SPH**	0.32
DIFF.IND.	79.33
SI UNSAT.	0.49

RATIOS	WT.PC	MOL.PC
OR+LC+KP	61.72	60.59
AB+NE	24.21	25.59
AN	14.07	13.82
QTZ	43.70	66.46
NE	15.43	9.96
KP	40.81	23.54
CAO+BAO+SRO	17.81	24.65
NA2O	17.64	22.39
K2O+RB2O	64.31	52.98
MGO	1.34	2.75
ALK+RB2O	77.23	73.32
FE AS FEO	21.39	23.93
FE2/FE2+FE3	21.69	21.70

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.728

****CY1060A **** #60234

	WT.PC	MOL.PC	MOL.PR
SIO2	51.70	57.54	0.8936
TIO2	1.00	0.81	0.0128
AL2O3	15.45	8.49	0.1519
FE2O3	5.67	2.29	0.0355
FEO	5.74	6.36	0.0911
MNO	0.20	0.18	0.0029
MGO	9.68	4.78	0.0742
CAO	9.11	9.51	0.1446
NA2O	2.39	2.49	0.0386
K2O	7.00	4.79	0.0743
H2O+	1.85	6.61	0.1027
H2O-	0.00	0.00	0.0000
P2O5	0.59	0.27	0.0042
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.69		
LESSO	0.00		
TOTAL	99.69		

	ATOMS
SI	50.171
TI	0.593
AL	15.020
FE3	4.042
FE2	5.171
MN	0.161
MG	4.222
CA	6.573
NA	4.289
K	8.461
H	11.692
	0.000
F	0.473
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
MN	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	41.57
AB	19.68
AN	5.30
LC	0.00
NE	0.56
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	16.06
WO	4.56
HY	0.00
OL	0.00
CS	0.00
MT	6.58
CM	0.00
HM	1.13
IL	1.90
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	1.39
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.33
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.69
FE/FE+MG	0.00
OR+AB+AN	65.90
NE+LC+KP	0.54
AC+DI+HY*	20.42
OL+CS	0.00
MT+CM+HM	7.71
IL+SPH**	1.90
DIFF.IND.	61.14
SI UNSAT.	0.46

RATIOS	WT.PC	MOL.PC
OR+LC+KP	62.27	60.72
AB+NE	29.75	31.50
AN	7.98	7.78
QTZ	43.63	66.29
NE	17.92	11.51
KP	38.45	22.20
CAO+BAO+SRO	46.34	56.16
NA2O	13.65	14.97
K2O+R2O	40.00	28.86
MGO	14.64	24.80
ALK+RB2O	45.98	37.75
FE AS FEO	39.38	37.45
FE2/FE2+FE3	36.56	36.58

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CY1[illegible] **** #60235

	WT.PC	MOL.PC	MOL.PR
SIO2	48.34	52.31	0.8127
TIO2	1.13	0.92	0.0141
AL2O3	12.62	8.04	0.1235
FE2O3	6.59	2.64	0.0413
FEO	4.97	4.50	0.0625
MNO	0.21	0.19	0.0030
MGO	4.40	7.14	0.1190
CAO	11.06	12.31	0.1772
NA2O	2.13	2.24	0.0352
K2O	4.48	3.37	0.0518
H2O+	1.44	2.19	0.0799
H2O-	0.00	0.00	0.0000
P2O5	0.32	0.33	0.0034
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.54		
LESSO	0.00		
TOTAL	98.54		

	ATOMS
SI	47.823
TI	0.832
AL	14.566
FE3	4.856
FE2	3.251
MN	0.174
MG	7.005
CA	11.625
NA	4.118
K	5.057
OH	9.407
	0.000
P	0.090
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	28.36
AB	18.55
AN	10.24
LC	0.00
NE	3.53
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	26.48
WO	2.24
HY	0.00
OL	0.00
CS	0.00
MT	9.55
CM	0.00
HM	0.00
IL	2.15
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	1.93
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.41
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.54
FE/FE+MG	0.02
OR+AB+AN	51.53
NE+LC+KP	3.25
AC+DI+HY*	28.72
OL+CS	0.00
MT+CM+HM	9.55
IL+SPH**	2.15
DIFF.IND.	44.54
SI UNSAT.	2.75

RATIOS	WT.PC	MOL.PC
OR+LC+KP	32.66	49.17
AB+NE	28.63	33.37
AN	13.69	17.46
QTZ	40.77	63.46
NE	22.43	14.77
KP	36.80	21.76
CAO+BAO+SRO	61.04	69.40
NA2O	12.03	12.37
K2O+R2O	26.93	18.23
MGO	21.65	34.33
ALK+RB2O	32.14	25.04
FE AS FEO	46.02	40.59
FE2/FE2+FE3	41.35	41.36

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CY109 **** #60236

	WT.PC	MOL.PC	MOL.PR
SIO2	57.69	64.16	0.9600
TIO2	0.94	0.79	0.0105
AL2O3	16.57	19.36	0.1625
FE2O3	4.03	1.69	0.0252
FEO	3.23	3.00	0.0450
MNO	0.13	0.12	0.0018
MGO	1.56	2.62	0.0392
CAO	4.52	5.39	0.0806
NA2O	3.93	4.24	0.3634
K2O	6.33	4.49	0.0672
H2O+	0.69	2.56	0.0383
H2O-	0.00	0.00	0.0000
P2O5	0.36	0.17	0.0025
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.99		
LESSO	0.00		
TOTAL	99.99		

	ATOMS
SI	53.849
TI	0.590
AL	13.232
FE3	2.831
FE2	2.522
MN	0.103
MG	2.196
CA	4.521
NA	7.112
K	7.539
OH	4.297
	0.000
P	0.285
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	1.33
C	0.00
ZR	0.00
OR	37.41
AB	33.25
AN	8.85
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	8.99
WO	0.00
HY	1.07
OL	0.00
CS	0.00
MT	5.84
CM	0.00
HM	0.00
IL	1.59
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.35
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.67
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.99
FE/FE+MG	0.22
OR+AB+AN	79.55
NE+LC+KP	0.00
AC+DI+HY*	10.06
OL+CS	0.00
MT+CM+HM	5.84
IL+SPH**	1.59
DIFF.IND.	71.99
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	47.03	45.85
AB+NE	41.60	43.26
AN	11.16	10.89
QTZ	45.45	67.59
NE	25.02	15.74
KP	29.53	16.69
CAO+BAO+SRO	50.53	58.16
NA2O	26.59	30.02
K2O+R2O	42.83	31.82
MGO	8.39	14.67
ALK+RB2O	34.50	49.91
FE AS FEO	37.11	36.42
FE2/FE2+FE3	48.09	48.11

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CY11[illegible] **** #60237

	WT.PC	MOL.PC	MOL.PR
SIO2	55.03	57.25	0.9157
TIO2	0.52	0.41	0.0065
AL2O3	14.25	8.74	0.1398
FE2O3	3.70	1.45	0.0232
FEO	3.71	3.23	0.0516
MNO	0.16	0.14	0.0023
MGO	5.04	7.81	0.1250
CAO	7.08	10.12	0.1619
NA2O	3.87	3.90	0.0624
K2O	4.06	2.71	0.0433
H2O+	1.21	4.20	0.0672
H2O-	0.00	0.00	0.0000
P2O5	0.11	0.05	0.0008
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.76		
LESSO	0.00		
TOTAL	100.76		

	ATOMS
SI	51.394
TI	0.365
AL	15.668
FE3	2.661
FE2	2.898
MN	0.127
MG	7.036
CA	9.087
NA	7.067
K	4.362
OH	7.539
	0.000
P	0.087
C	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	24.11
AB	26.27
AN	9.47
LC	0.00
NE	3.50
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	27.76
WO	0.00
HY	0.00
OL	1.00
CS	0.00
MT	5.36
CM	0.00
HM	0.00
IL	0.99
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.26
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.21
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.76
FE/FE+MG	0.16
OR+AB+AN	59.85
NE+LC+KP	3.50
AC+DI+HY*	27.75
OL+CS	1.00
MT+CM+HM	5.36
IL+SPH**	0.99
DIFF.IND.	53.69
SI UNSAT.	3.68

RATIOS	WT.PC	MOL.PC
OR+LC+KP	34.05	35.29
AB+NE	47.00	50.86
AN	14.94	13.86
QTZ	41.65	63.86
NE	32.91	21.34
KP	25.43	14.81
CAO+BAO+SRO	53.32	60.49
NA2O	22.72	23.32
K2O+R2O	23.96	16.18
MGO	24.96	37.77
ALK+RB2O	39.36	31.95
FE AS FEO	35.69	30.23
FE2/FE2+FE3	53.76	53.77

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

****CY111 **** #60238

	WT.PC	MOL.PC	MOL.PR
SIO2	59.35	64.34	0.9459
TIO2	0.34	0.28	0.0043
AL2O3	17.79	11.43	0.1745
FE2O3	2.93	1.20	0.0163
FEO	1.15	1.25	0.0192
MNO	0.09	0.08	0.0013
MGO	0.80	1.30	0.0193
CAO	3.37	3.75	0.0501
NA2O	2.39	2.52	0.0366
K2O	10.34	7.17	0.1193
H2O+	1.76	0.88	0.0977
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.53		
LESSO	0.00		
TOTAL	100.53		

	ATOMS
SI	54.238
TI	0.214
AL	19.197
FE3	2.019
FE2	1.057
MN	0.070
MG	1.092
CA	3.106
NA	4.242
K	12.078
OH	10.746
TH	0.000
NC	0.000
AC	0.000
P	0.070
C	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
OL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	61.11
AB	19.17
AN	7.63
LC	0.00
NE	0.57
AP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	4.30
WO	1.39
HY	0.00
CL	0.00
CS	0.00
MT	3.75
CM	0.00
HM	0.34
IL	0.65
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.76
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.53
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	69.34	68.01
AB+NE	22.40	23.89
AN	8.25	8.10
QTZ	43.50	66.36
NE	13.53	8.74
KP	42.95	24.89
CAO+BAO+SRO	20.93	28.83
NA2O	14.84	18.50
K2O+RB2O	64.22	52.67
MGO	4.54	8.81
ALK+RB2O	72.13	65.32
FE AS FEO	23.23	25.37
FE2/FE2+FE3	35.60	35.82

OR+AB+AN	87.56
NE+LC+KP	0.57
AC+DI+HY*	5.69
OL+CS	0.00
MT+CM+HM	4.09
IL+SPH**	0.65
DIFF.IND.	80.35
SI UNSAT.	0.43

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.850

****CY113A **** #60239

	WT.PC	MOL.PC	MOL.PR
SIO2	61.38	68.06	1.0214
TIO2	0.62	0.52	0.0078
AL2O3	13.36	12.00	0.1801
FE2O3	2.67	1.20	0.0180
FEO	1.07	0.99	0.0149
MNO	0.08	0.08	0.0011
MGO	0.79	1.31	0.0196
CAO	2.81	3.19	0.0565
NA2O	4.44	4.77	0.0716
K2O	7.35	5.20	0.0780
H2O+	0.73	2.70	0.0405
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.08	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.46		
LESSO	0.00		
TOTAL	100.46		

	ATOMS
SI	55.768
TI	0.424
AL	19.664
FE3	1.962
FE2	0.413
MN	0.085
MG	1.070
CA	2.541
NA	7.821
K	8.521
OH	4.425
TH	0.000
NC	0.000
AC	0.000
P	0.123
C	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
CL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
O	160.000

CIPW NORM	
QTZ	1.96
C	0.00
ZR	0.00
OR	43.44
AB	37.57
AN	5.46
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	2.68
WO	0.00
HY	0.73
CL	0.00
CS	0.00
MT	1.91
CM	0.00
HM	1.55
IL	1.18
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.58
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.72
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.46
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	48.55	47.33
AB+NE	41.99	43.44
AN	9.46	9.23
QTZ	45.64	67.77
NE	24.56	15.43
KP	29.79	16.81
CAO+BAO+SRO	18.13	23.72
NA2O	30.33	36.50
K2O+RB2O	51.04	39.77
MGO	4.04	8.86
ALK+RB2O	72.23	67.65
FE AS FEO	22.88	23.49
FE2/FE2+FE3	30.81	30.83

OR+AB+AN	89.47
NE+LC+KP	0.00
AC+DI+HY*	3.40
OL+CS	0.00
MT+CM+HM	3.46
IL+SPH**	1.18
DIFF.IND.	82.85
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.831

****CY113B **** #60240

	WT.PC	MOL.PC	MOL.PR
SIO2	57.19	61.03	0.9517
TIO2	0.49	0.39	0.0061
AL2O3	18.94	11.94	0.1862
FE2O3	3.12	1.25	0.0195
FEO	1.22	1.09	0.0170
MNO	0.15	0.14	0.0023
MGO	0.56	1.40	0.0218
CAO	3.99	4.56	0.0711
NA2O	2.97	3.07	0.0479
K2O	8.31	5.56	0.0592
H2O+	2.64	9.40	0.1465
H2O-	0.00	0.00	0.0000
P2O5	0.15	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.10		
LESSO	0.00		
TOTAL	100.10		

	ATOMS
SI	51.918
TI	0.335
AL	20.311
FE3	2.132
FE2	0.926
MN	0.123
MG	1.191
CA	3.682
NA	5.227
K	9.626
OH	15.939
TH	0.000
NC	0.000
AC	0.000
P	0.115
C	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
CL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
O	160.000

CIPW NORM	
QTZ	0.00
C	0.00
ZR	0.00
OR	49.12
AB	24.80
AN	13.92
LC	0.00
NE	0.13
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	3.81
WO	0.00
HY	0.00
OL	0.30
CS	0.00
MT	3.03
CM	0.00
HM	1.03
IL	0.93
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.35
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.63
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.10
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	55.81	54.75
AB+NE	28.33	29.73
AN	15.61	15.52
QTZ	43.96	66.56
NE	19.37	11.77
KP	37.67	21.67
CAO+BAO+SRO	26.13	34.32
NA2O	19.45	23.11
K2O+RB2O	54.42	42.56
MGO	5.34	10.09
ALK+RB2O	82.03	62.95
FE AS FEO	25.61	26.96
FE2/FE2+FE3	32.96	32.99

OR+AB+AN	87.84
NE+LC+KP	0.18
AC+DI+HY*	3.51
OL+CS	0.30
MT+CM+HM	4.06
IL+SPH**	0.93
DIFF.IND.	74.10
SI UNSAT.	0.28

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.731

****CY113C **** #60241

	WT.PC	MOL.PC	MOL.PR
SIO2	56.26	60.92	0.9362
TIO2	0.52	0.42	0.0065
AL2O3	19.49	12.44	0.1912
FE2O3	2.06	0.84	0.0129
FEO	2.09	1.89	0.0291
MNO	0.17	0.16	0.0024
MGO	0.78	1.26	0.0193
CAO	4.11	4.77	0.0733
NA2O	3.85	4.04	0.0621
K2O	9.12	5.61	0.0862
H2O+	2.10	7.58	0.1166
H2O-	0.00	0.00	0.0000
P2O5	0.15	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.70		
LESSO	0.00		
TOTAL	99.70		

	ATOMS
SI	51.798
TI	0.360
AL	21.152
FE3	1.427
FE2	1.609
MN	0.133
MG	1.070
CA	4.055
NA	6.372
K	9.539
OH	12.899
TH	0.000
NC	0.000
AC	0.000
P	0.117
C	0.000
NS	0.000
KS	0.000
DI	6.16
WO	0.00
HY	0.00
CL	0.37
CS	0.00
MT	2.99
CM	0.00
HM	0.00
IL	0.99
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.35
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.09
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.70
FE/FE+MG	0.38

RATIOS	WT.PC	MOL.PC
OR+LC+KP	55.32	50.79
AB+NE	30.94	36.59
AN	13.74	12.62
QTZ	39.98	62.66
NE	23.56	15.64
KP	35.44	21.70
CAO+BAO+SRO	25.56	33.07
NA2O	23.94	28.02
K2O+RB2O	50.50	38.90
MGO	4.63	8.60
ALK+RB2O	70.93	65.93
FE AS FEO	24.39	25.47
FE2/FE2+FE3	54.94	54.96

OR+AB+AN	79.97
NE+LC+KP	6.78
AC+DI+HY*	6.19
OL+CS	0.37
MT+CM+HM	2.99
IL+SPH**	0.99
DIFF.IND.	74.03
SI UNSAT.	5.87

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.776

****CY114OR **** #60242

	WT.PC	MOL.PC	MOL.PR
SIO2	61.31	67.71	1.0202
TIO2	0.41	0.34	0.0051
AL2O3	11.12	8.24	0.1287
FE2O3	3.39	1.41	0.0212
FEO	2.47	2.28	0.0344
MNO	0.35	0.33	0.0049
MGO	1.41	2.32	0.0350
CAO	4.62	5.47	0.0824
NA2O	2.69	2.38	0.0434
K2O	9.94	7.00	0.1055
H2O+	0.43	1.58	0.0239
H2O-	0.00	0.00	0.0000
P2O5	0.30	0.14	0.0021
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.44		
LESSO	0.00		
TOTAL	100.44		

	ATOMS
SI	57.468
TI	0.289
AL	14.497
FE3	2.191
FE2	1.976
MN	0.275
MG	1.970
CA	4.041
NA	4.883
K	11.889
OH	2.689
F	0.000
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
P	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	1.42
C	0.00
ZR	0.00
OR	58.75
AB	12.14
AN	0.00
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	15.81
WO	0.33
HY	0.00
OL	0.00
CS	0.00
MT	0.23
CM	0.00
HM	0.00
IL	0.78
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.71
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.42
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.44
FE/FE+MG	0.49
OR+AB+AN	70.89
NE+LC+KP	0.00
AC+DI+HY*	25.99
OL+CS	0.00
MT+CM+HM	0.23
IL+SPH**	0.78
DIFF.IND.	72.32
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	82.87	82.01
AB+NE	17.13	17.99
AN	0.00	-0.00
QTZ	44.74	67.66
NE	9.10	5.92
KP	46.16	26.52
CAO+BAO+SRO	26.78	35.62
NA2O	15.59	18.76
K2O+RB2O	57.62	45.62
MG	7.08	13.16
ALK+RB2O	63.43	56.06
FE AS FEO	29.48	30.78
FE2/FE2+FE3	48.04	48.08

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****CY114F **** #60242

	WT.PC	MOL.PC	MOL.PR
SIO2	62.08	67.12	1.0350
TIO2	0.64	0.36	0.0050
AL2O3	15.14	9.65	0.1489
FE2O3	2.14	1.45	0.0134
FEO	1.53	1.42	0.0213
MNO	0.16	0.11	0.0017
MGO	1.26	2.03	0.0313
CAO	3.16	4.01	0.0599
NA2O	2.33	2.31	0.0376
K2O	10.75	7.54	0.1141
H2O+	0.43	1.60	0.0239
H2O-	0.00	0.00	0.0000
P2O5	0.22	0.13	0.0015
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.04		
LESSO	0.00		
TOTAL	100.04		

	ATOMS
SI	57.663
TI	0.427
AL	16.621
FE3	1.496
FE2	1.149
MN	0.224
MG	1.744
CA	3.144
NA	4.196
K	12.741
OH	2.665
P	0.173
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	2.28
C	0.00
ZR	0.00
OR	63.54
AB	18.33
AN	0.50
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	1.31
KS	0.00
DI	0.00
WO	7.35
HY	2.22
OL	0.30
CS	0.00
MT	0.00
CM	2.45
HM	0.00
IL	0.00
SPH	1.21
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.32
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.42
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.04
FE/FE+MG	0.12
OR+AB+AN	81.77
NE+LC+KP	0.00
AC+DI+HY*	11.33
OL+CS	0.00
MT+CM+HM	2.45
IL+SPH**	1.21
DIFF.IND.	94.05
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	77.71	76.66
AB+NE	22.29	23.34
AN	0.00	-0.00
QTZ	45.30	68.03
NE	11.73	7.46
KP	42.95	24.51
CAO+BAO+SRO	20.44	20.31
NA2O	14.17	17.76
K2O+RB2O	65.39	53.93
MGO	7.03	13.43
ALK+RB2O	73.01	65.18
FE AS FEO	19.96	21.39
FE2/FE2+FE3	46.35	46.17

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.019

****CY115 ****#60243

	WT.PC	MOL.PC	MOL.PR
SIO2	60.91	65.72	1.0136
TIO2	0.56	0.45	0.0070
AL2O3	15.38	9.93	0.1503
FE2O3	3.13	1.29	0.0196
FEO	1.61	1.55	0.0252
MNO	0.15	0.16	0.0021
MGO	0.35	1.33	0.0211
CAO	4.51	5.22	0.0304
NA2O	2.04	2.17	0.0329
K2O	11.34	7.92	0.1204
H2O+	0.31	2.96	0.0450
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.55		
LESSO	0.00		
TOTAL	101.55		

	ATOMS
SI	56.208
TI	0.339
AL	16.730
FE3	2.174
FE2	1.397
MN	0.117
MG	1.169
CA	4.460
NA	3.650
K	13.353
OH	4.987
P	0.125
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	67.03
AB	15.53
AN	0.00
LC	0.00
NE	0.16
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	1.13
NS	0.00
KS	0.00
DI	5.35
WO	6.09
HY	0.00
OL	0.00
CS	0.00
MT	3.97
CM	0.00
HM	0.00
IL	1.06
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.33
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.80
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.65
FE/FE+MG	0.13
OR+AB+AN	82.71
NE+LC+KP	0.16
AC+DI+HY*	12.57
OL+CS	0.00
MT+CM+HM	3.97
IL+SPH**	1.06
DIFF.IND.	82.86
SI UNSAT.	0.13

RATIOS	WT.PC	MOL.PC
OR+LC+KP	10.69	79.81
AB+NE	19.11	20.19
AN	0.00	-0.00
QTZ	43.60	66.58
NE	10.44	6.75
KP	45.96	26.67
CAO+BAO+SRO	25.21	34.41
NA2O	11.40	14.08
K2O+RB2O	63.39	51.51
MGO	4.47	8.75
ALK+RB2O	70.40	63.64
FE AS FEO	25.13	27.61
FE2/FE2+FE3	41.04	41.06

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.017

****CY116 **** #60244

	WT.PC	MOL.PC	MOL.PR
SIO2	62.97	68.47	1.0478
TIO2	0.19	0.16	0.0024
AL2O3	17.50	11.58	0.1716
FE2O3	1.35	0.56	0.0085
FEO	0.47	0.43	0.0065
MNO	0.10	0.09	0.0014
MGO	0.57	0.94	0.0141
CAO	2.34	2.77	0.0417
NA2O	3.59	3.94	0.0579
K2O	9.29	6.54	0.0986
H2O+	1.03	3.79	0.0572
H2O-	0.00	0.00	0.0000
P2O5	0.06	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.48		
LESSO	0.00		
TOTAL	99.48		

	ATOMS
SI	57.395
TI	0.130
AL	16.803
FE3	0.926
FE2	0.358
MN	0.077
MG	0.774
CA	2.286
NA	6.344
K	10.305
OH	6.263
F	0.062
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	2.38
C	0.00
ZR	0.00
OR	54.91
AB	30.37
AN	4.20
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	3.06
WO	1.23
HY	0.00
OL	0.00
CS	0.00
MT	1.29
CM	0.00
HM	0.46
IL	0.36
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.19
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.03
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.48
FE/FE+MG	0.00
OR+AB+AN	89.48
NE+LC+KP	0.00
AC+DI+HY*	4.29
OL+CS	0.00
MT+CM+HM	1.75
IL+SPH**	0.36
DIFF.IND.	87.66
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	61.36	60.11
AB+NE	33.94	35.29
AN	4.69	4.69
QTZ	45.64	68.01
NE	14.77	11.83
KP	35.59	20.15
CAO+BAO+SRO	15.37	21.05
NA2O	23.59	29.21
K2O+RB2O	61.04	49.75
MGO	3.74	7.23
ALK+RB2O	84.54	80.06
FE AS FEO	11.71	12.71
FE2/FE2+FE3	31.94	31.99

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.912

****Cy117 **** #60245

	WT.PC	MOL.PC	MOL.PR
SIO2	56.72	58.74	0.9439
TIO2	0.76	0.59	0.0095
AL2O3	13.47	8.51	0.1370
FE2O3	4.87	1.90	0.0305
FEO	5.53	4.51	0.0777
MNO	0.13	0.15	0.0065
MGO	4.54	7.01	0.1126
CAO	9.67	10.73	0.1724
NA2O	2.91	2.92	0.0468
K2O	1.20	0.79	0.0127
H2O+	1.03	3.73	0.0599
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.07	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.64		
LESSO	0.00		
TOTAL	101.64		

	ATOMS
SI	52.979
TI	0.355
AL	15.130
FE3	1.365
FE2	4.235
MN	0.140
MG	6.213
CA	6.514
NA	5.180
K	1.436
OH	6.615
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	11.24
C	0.50
ZR	0.00
OR	7.09
AB	24.85
AN	21.32
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	20.54
WO	0.00
HY	6.53
OL	0.00
CS	0.00
MT	7.06
CM	0.00
HM	0.00
IL	1.44
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.38
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.07
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.64
FE/FE+MG	0.26
OR+AB+AN	53.23
NE+LC+KP	0.00
AC+DI+HY*	27.22
OL+CS	0.00
MT+CM+HM	7.06
IL+SPH**	1.44
DIFF.IND.	42.95
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	15.32	12.95
AB+NE	46.23	47.73
AN	40.42	39.32
QTZ	59.56	78.10
NE	31.03	17.22
KP	9.38	4.67
CAO+BAO+SRO	70.17	74.29
NA2O	21.12	20.22
K2O+RB2O	8.71	5.49
MGO	24.16	35.92
ALK+RB2O	21.87	19.04
FE AS FEO	53.97	45.04
FE2/FE2+FE3	56.79	56.80

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****Cy118 **** #60246

	WT.PC	MOL.PC	MOL.PR
SIO2	55.92	56.68	0.9305
TIO2	0.75	0.57	0.0094
AL2O3	14.20	8.64	0.1393
FE2O3	2.40	0.92	0.0150
FEO	7.05	5.98	0.0981
MNO	0.19	0.16	0.0027
MGO	5.01	7.59	0.1243
CAO	10.05	10.92	0.1792
NA2O	2.66	2.61	0.0428
K2O	1.52	0.93	0.0151
H2O+	1.32	5.14	0.0844
H2O-	0.00	0.00	0.0000
P2O5	0.14	0.06	0.0010
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.31		
LESSO	0.00		
TOTAL	101.31		

	ATOMS
SI	51.441
TI	0.519
AL	15.168
FE3	1.662
FE2	5.424
MN	0.148
MG	6.169
CA	9.967
NA	4.744
K	1.667
OH	9.528
TH	0.000
NC	0.000
AC	0.109
NS	0.000
KS	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	7.50
C	0.00
ZR	0.00
OR	8.39
AB	22.21
AN	22.22
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	21.53
WO	0.00
HY	11.92
OL	0.00
CS	0.00
MT	3.48
CM	0.00
HM	0.00
IL	1.42
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.33
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.51
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.31
FE/FE+MG	0.33
OR+AB+AN	53.52
NE+LC+KP	0.00
AC+DI+HY*	33.55
OL+CS	0.00
MT+CM+HM	3.48
IL+SPH**	1.42
DIFF.IND.	38.40
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	15.66	15.29
AB+NE	42.06	43.50
AN	42.26	41.21
QTZ	55.83	75.47
NE	31.75	18.16
KP	12.42	6.38
CAO+BAO+SRO	71.13	75.55
NA2O	18.83	18.09
K2O+RB2O	10.05	6.36
MGO	27.10	39.69
ALK+RB2O	22.07	18.52
FE AS FEO	50.84	41.79
FE2/FE2+FE3	77.03	77.03

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****4 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	55.20	62.36	0.9185
TIO2	0.98	0.84	0.0123
AL2O3	16.91	11.35	0.1658
FE2O3	7.17	3.07	0.0449
FEO	0.00	0.00	0.0000
MNO	0.22	0.21	0.0031
MGO	1.16	1.97	0.0288
CAO	5.42	6.61	0.0966
NA2O	0.41	0.53	0.0077
K2O	9.71	7.05	0.1031
H2O+	1.42	5.39	0.0788
H2O-	0.00	0.00	0.0000
P2O5	0.23	0.11	0.0016
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
RO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.90		
LESSO	0.00		
TOTAL	98.90		

	ATOMS
SI	52.114
TI	0.686
AL	18.919
FE3	5.094
FE2	0.000
MN	0.176
MG	1.632
CA	5.483
NA	0.879
K	11.697
OH	8.944
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
OL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	0.000
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	0.000
FE/FE+MG	0.000
OR+AB+AN	0.000
NE+LC+KP	0.000
AC+DI+HY*	0.000
OL+CS	0.000
MT+CM+HM	0.000
IL+SPH**	0.000
DIFF.IND.	0.000
SI UNSAT.	0.000

	CIPW NORM
QTZ	4.72
C	0.00
ZR	0.00
OR	57.39
AB	4.06
AN	15.31
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	5.86
WO	0.00
HY	0.17
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	7.17
IL	0.47
SPH	1.80
PF	0.00
RU	0.00
AP	0.00
HAP	0.54
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.41
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.90
FE/FE+MG	0.00
OR+AB+AN	76.76
NE+LC+KP	0.00
AC+DI+HY*	6.03
OL+CS	0.00
MT+CM+HM	7.17
IL+SPH**	2.26
DIFF.IND.	66.17
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	74.77	74.52
AB+NE	5.29	5.60
AN	19.94	19.89
QTZ	47.39	70.19
NE	3.32	2.98
KP	49.28	27.73
CAO+BAO+SRO	34.72	46.59
NA2O	3.07	3.75
K2O+RB2O	62.20	49.69
MGO	5.44	12.37
ALK+RB2O	56.54	47.67
FE AS FEO	37.02	39.96
FE2/FE2+FE3	5.30	3.34

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****5Cx ****

	WT.PC	MOL.PC	MOL.PR
SIO2	53.74	62.63	0.8943
TIO2	0.99	0.87	0.0124
AL2O3	13.74	9.44	0.1348
FE2O3	9.76	4.23	0.0611
FEO	0.00	0.00	0.0000
MNO	0.21	0.21	0.0030
MGO	3.73	6.48	0.0925
CAO	7.56	9.44	0.1348
NA2O	0.51	0.53	0.0082
K2O	7.69	5.72	0.0916
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	0.74	0.37	0.0052
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.67		
LESSO	0.00		
TOTAL	98.67		

	ATOMS
SI	52.084
TI	0.722
AL	15.697
FE3	7.119
FE2	0.000
MN	0.172
MG	5.388
CA	7.852
NA	0.958
K	9.510
OH	0.000
TH	0.000
NC	0.000
AC	0.607
NS	0.000
KS	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	6.02
C	0.30
ZR	0.00
OR	45.45
AB	4.33
AN	12.49
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	13.67
WO	0.00
HY	2.95
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	9.75
IL	0.45
SPH	1.35
PF	0.00
RU	0.00
AP	0.00
HAP	1.75
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	-0.03
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.67
FE/FE+MG	0.00
OR+AB+AN	62.25
NE+LC+KP	0.00
AC+DI+HY*	16.62
OL+CS	0.00
MT+CM+HM	9.75
IL+SPH**	2.30
DIFF.IND.	55.79
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	73.01	72.69
AB+NE	6.93	7.32
AN	20.06	19.98
QTZ	49.52	71.89
NE	4.17	2.57
KP	46.29	25.54
CAO+BAO+SRO	47.97	60.00
NA2O	3.24	3.66
K2O+RB2O	48.79	36.34
MGO	17.83	30.94
ALK+RB2O	59.17	29.22
FE AS FEO	42.94	40.75
FE2/FE2+FE3	2.34	2.36

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****S718G ****

	WT.PC	MOL.PC	MOL.PR
SIO2	32.36	63.11	0.5391
TIO2	0.58	0.33	0.0073
AL2O3	7.15	4.21	0.0699
FE2O3	6.87	5.05	0.0430
FEO	0.00	0.00	0.0001
MNO	0.15	0.12	0.0017
MGO	3.02	3.40	0.0749
CAO	4.13	4.65	0.0736
NA2O	0.01	0.02	0.0002
K2O	3.27	4.04	0.0347
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	1.16	0.96	0.0082
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	58.62		
LESSO	0.00		
TOTAL	58.62		

SI	52.018	
TI	0.677	
AL	13.519	
FE3	3.316	
FE2	0.590	
MN	0.177	
MG	7.240	
CA	7.119	
NA	0.051	
K	6.711	
OH	0.000	
	0.000	
P	1.530	
C	0.000	
	0.000	
ZR	0.000	
CR	0.000	
V	0.000	
NI	0.000	
CO	0.000	
BA	0.000	
SR	0.000	
F	0.000	
CL	0.000	
S	0.000	
LI	0.000	
RB	0.000	
O	160.000	

QTZ	10.37
C	0.00
ZR	0.00
OR	19.33
AB	0.00
AN	8.75
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	1.35
WO	0.00
HY	6.90
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	6.87
IL	0.28
SPH	1.01
PF	0.00
RU	0.00
AP	0.00
HAP	2.76
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	-0.05
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	58.62
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	66.27	66.25
AB+NE	0.29	0.31
AN	33.44	33.44
QTZ	62.97	81.73
NE	0.15	0.09
KP	36.88	18.19
CAO+BAO+SRO	55.74	67.86
NA2O	0.13	0.15
K2O+RB2O	44.13	31.99
MGO	23.95	37.90
ALK+RB2O	26.01	17.65
FE AS FEO	50.05	44.46
FE2/FE2+FE3	2.06	2.09

OR+AB+AN	29.16
NE+LC+KP	0.00
AC+DI+HY*	8.24
OL+CS	0.00
MT+CM+HM	6.87
IL+SPH**	1.29
DIFF.IND.	29.73
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****18 **** #60250

	WT.PC	MOL.PC	MOL.PR
SIO2	50.17	53.72	0.8548
TIO2	1.54	1.00	0.0155
AL2O3	11.65	7.38	0.1147
FE2O3	11.24	4.53	0.0704
FEO	0.00	0.10	0.0000
MNO	0.23	0.21	0.0032
MGO	5.40	8.62	0.1336
CAO	11.71	13.44	0.2088
NA2O	0.35	0.36	0.0056
K2O	4.53	3.09	0.0491
H2O+	2.02	2.22	0.1121
H2O-	0.00	0.00	0.0000
P2O5	0.36	0.44	0.0063
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.54		
LESSO	0.00		
TOTAL	99.54		

SI	47.680	
TI	0.486	
AL	13.096	
FE3	8.039	
FE2	0.000	
MN	0.165	
MG	7.649	
CA	11.926	
NA	0.645	
K	5.493	
OH	12.807	
	0.000	
P	0.772	
C	0.000	
	0.000	
ZR	0.000	
CR	0.000	
V	0.000	
NI	0.000	
CO	0.000	
BA	0.000	
SR	0.000	
F	0.000	
CL	0.000	
S	0.000	
LI	0.000	
RB	0.000	
O	160.000	

QTZ	7.89
C	0.00
ZR	0.00
OR	26.77
AB	4.96
AN	18.95
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	24.49
WO	0.00
HY	2.09
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	11.24
IL	0.49
SPH	2.41
PF	0.00
RU	0.00
AP	0.00
HAP	2.26
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.96
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.54
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	57.35	57.12
AB+NE	6.34	6.71
AN	36.30	36.17
QTZ	55.30	76.31
NE	4.26	2.49
KP	40.43	21.20
CAO+BAO+SRO	70.55	79.53
NA2O	2.11	2.15
K2O+RB2O	27.31	18.32
MGO	26.13	40.38
ALK+RB2O	23.66	16.20
FE AS FEO	50.15	43.42
FE2/FE2+FE3	2.22	2.25

OR+AB+AN	46.66
NE+LC+KP	0.00
AC+DI+HY*	26.58
OL+CS	0.00
MT+CM+HM	11.24
IL+SPH**	2.90
DIFF.IND.	37.63
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****JROCRL ****

	WT.PC	MOL.PC	MOL.PR
SIO2	56.01	63.72	0.9320
TIO2	0.37	0.32	0.0046
AL2O3	20.23	13.60	0.1989
FE2O3	1.72	0.74	0.0103
FEO	2.59	2.46	0.0360
MNO	2.10	2.02	0.0296
MGO	0.09	0.14	0.0020
CAO	2.65	3.23	0.0473
NA2O	0.01	0.01	0.0002
K2O	10.23	7.46	0.1091
H2O+	1.66	6.30	0.0921
H2O-	0.00	0.00	0.0000
P2O5	0.01	0.00	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	97.76		
LESSO	0.00		
TOTAL	97.76		

SI	52.299	
TI	0.263	
AL	22.578	
FE3	1.223	
FE2	2.046	
MN	1.680	
MG	0.113	
CA	2.652	
NA	0.018	
K	12.339	
OH	10.459	
	0.000	
P	0.008	
C	0.000	
	0.000	
ZR	0.000	
CR	0.000	
V	0.000	
NI	0.000	
CO	0.000	
BA	0.000	
SR	0.000	
F	0.000	
CL	0.000	
S	0.000	
LI	0.000	
RB	0.000	
O	160.000	

QTZ	7.81
C	4.34
ZR	0.00
OR	60.76
AB	0.08
AN	13.08
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	6.81
OL	0.00
CS	0.00
MT	2.49
CM	0.00
HM	0.00
IL	0.70
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.02
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.66
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	97.76
FE/FE+MG	0.96

RATIOS	WT.PC	MOL.PC
OR+LC+KP	82.19	82.18
AB+NE	0.11	0.12
AN	17.70	17.70
QTZ	49.64	72.18
NE	0.07	0.04
KP	50.29	27.78
CAO+BAO+SRO	20.46	30.18
NA2O	0.03	0.10
K2O+RB2O	79.44	69.71
MGO	0.43	1.00
ALK+RB2O	81.90	55.07
FE AS FEO	37.55	43.93
FE2/FE2+FE3	75.19	75.30

OR+AB+AN	73.93
NE+LC+KP	0.00
AC+DI+HY*	6.81
OL+CS	0.00
MT+CM+HM	2.49
IL+SPH**	0.70
DIFF.IND.	66.65
SI UNSAT.	0.00

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****JROCK2 **** #60251

	WT.PC	MOL.PC	MOL.PR
SIO2	55.47	62.30	0.9230
TIO2	0.38	0.32	0.0048
AL2O3	20.30	13.37	0.1991
FE2O3	1.59	0.67	0.0100
FEO	2.70	2.52	0.0376
MNO	1.89	1.79	0.0266
MGO	0.34	0.57	0.0084
CAO	2.63	3.15	0.0469
NA2O	1.75	1.90	0.0282
K2O	9.76	5.96	0.1036
H2O+	1.80	6.71	0.0999
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	93.70		
LESSO	0.00		
TOTAL	98.70		

SI	52.053	
TI	0.268	
AL	22.455	
FE3	1.123	
FE2	2.119	
MN	1.503	
MG	0.476	
CA	2.645	
NA	3.184	
K	11.687	
OH	11.269	
	0.000	
P	0.072	
C	0.000	
	0.000	
ZR	0.000	
CR	0.000	
V	0.000	
NI	0.000	
CO	0.000	
BA	0.000	
SR	0.000	
F	0.000	
CL	0.000	
S	0.000	
LI	0.000	
RB	0.000	
O	160.000	

QTZ	0.00
C	2.29
ZR	0.00
OR	57.69
AB	14.01
AN	12.46
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	3.41
OL	3.02
CS	0.00
MT	2.30
CM	0.00
HM	0.00
IL	0.72
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.80
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.70
FE/FE+MG	0.95

RATIOS	WT.PC	MOL.PC
OR+LC+KP	67.90	67.13
AB+NE	17.45	18.30
AN	14.67	14.52
QTZ	43.72	66.67
NE	11.06	7.14
KP	45.22	26.20
CAO+BAO+SRO	18.63	26.24
NA2O	12.34	15.79
K2O+RB2O	69.02	57.97
MGO	1.93	3.76
ALK+RB2O	64.41	58.75
FE AS FEO	35.69	37.49
FE2/FE2+FE3	76.24	76.33

OR+AB+AN	84.95
NE+LC+KP	0.00
AC+DI+HY*	3.41
OL+CS	3.02
MT+CM+HM	2.30
IL+SPH**	0.72
DIFF.IND.	72.49
SI UNSAT.	0.93

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.662

****JROCK22 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	56.80	61.37	0.9136
TIO2	0.39	0.33	0.0048
AL2O3	20.99	13.94	0.2059
FE2O3	1.69	0.72	0.0106
FEO	2.70	2.24	0.0376
MNO	1.83	1.75	0.0258
MGO	0.52	0.87	0.0129
CAO	2.61	3.15	0.0465
NA2O	1.41	1.54	0.0227
K2O	9.43	6.78	0.1001
H2O+	1.72	6.47	0.0955
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.26		
LESSO	0.00		
TOTAL	98.26		

	ATOMS
SI	51.940
TI	0.276
AL	23.274
FE3	1.196
FE2	2.124
MN	1.658
MG	0.729
CA	2.631
NA	2.571
K	11.313
LM	10.793
F	0.072
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	1.61
C	3.53
ZR	0.00
OR	55.74
AB	11.93
AN	12.36
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	7.60
OL	0.00
CS	0.00
MT	2.45
CM	0.00
HM	0.00
IL	0.74
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	1.72
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.28
FE/FE+MG	0.79

RATIOS	WT.PC	MOL.PC
OR+LC+KP	69.65	69.01
AB+NE	14.91	15.68
AN	15.45	15.31
QTZ	44.95	67.83
NE	9.33	5.95
KP	45.72	26.21
CAO+BAO+SRO	19.41	27.47
NA2O	10.43	13.43
K2O+RB2O	70.11	59.10
MGO	2.99	5.85
ALK+RB2O	62.26	55.77
FE AS FEO	34.75	38.39
FE2/FE2+FE3	74.87	74.97

OR+AB+AN	80.03
NE+LC+KP	0.00
AC+DI+HY*	7.60
OL+CS	0.00
MT+CM+HM	2.45
IL+SPH**	0.74
DIFF.IND.	69.27
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOO ** INCLUDES PF AND RU

A.I. 0.596

****LWGFR2 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	56.45	60.42	0.9393
TIO2	0.33	0.27	0.0041
AL2O3	19.14	12.07	0.1877
FE2O3	2.63	1.06	0.0165
FEO	0.82	0.73	0.0114
MNO	0.14	0.13	0.0020
MGO	0.11	0.19	0.0027
CAO	2.90	3.33	0.0517
NA2O	6.65	6.90	0.1073
K2O	8.40	5.74	0.0992
H2O+	2.57	9.13	0.1427
H2O-	0.00	0.00	0.0000
P2O5	0.02	0.01	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.16		
LESSO	0.00		
TOTAL	100.16		

	ATOMS
SI	51.699
TI	0.227
AL	20.653
FE3	1.813
FE2	0.623
MN	0.109
MG	0.150
CA	2.646
NA	11.807
K	9.816
OH	15.702
F	0.000
P	0.016
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.00
C	0.30
ZR	0.00
OR	49.55
AB	15.32
AN	0.00
LC	0.00
NE	19.70
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	4.03
NS	0.00
KS	0.00
DI	0.97
WO	5.46
HY	0.00
OL	0.00
CS	0.00
MT	1.79
CM	0.00
HM	0.00
IL	0.63
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.05
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	2.57
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.16
FE/FE+MG	0.36

RATIOS	WT.PC	MOL.PC
OR+LC+KP	58.64	47.51
AB+NE	41.36	52.49
AN	0.00	0.00
QTZ	33.61	55.79
NE	35.07	23.21
KP	33.32	21.01
CAO+BAO+SRC	16.16	20.84
NA2O	37.05	43.21
K2O+RB2O	46.80	35.94
MGO	0.60	1.11
ALK+RB2O	91.41	80.02
FE AS FEO	17.99	18.87
FE2/FE2+FE3	28.86	28.90

OR+AB+AN	64.96
NE+LC+KP	19.70
AC+DI+HY*	10.46
OL+CS	0.00
MT+CM+HM	1.79
IL+SPH**	0.63
DIFF.IND.	84.67
SI UNSAT.	16.67

* INCLUDES NS+KS+WO AND SPOO ** INCLUDES PF AND RU

A.I. 1.047

****LWGFRON ****

	WT.PC	MOL.PC	MOL.PR
SIO2	56.71	65.15	0.9403
TIO2	0.16	0.14	0.0021
AL2O3	19.08	12.90	0.1871
FE2O3	2.73	1.17	0.0174
FEO	0.42	0.77	0.0114
MNO	0.15	0.14	0.0021
MGO	0.09	0.13	0.0020
CAO	2.96	3.27	0.0584
NA2O	6.77	7.35	0.1092
K2O	7.73	5.36	0.0926
H2O+	1.37	3.12	0.0760
H2O-	0.00	0.00	0.0000
P2O5	0.02	0.01	0.0001
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.64		
LESSO	0.00		
TOTAL	98.64		

	ATOMS
SI	52.890
TI	0.348
AL	21.040
FE3	1.962
FE2	0.643
MN	0.112
MG	0.112
CA	2.954
NA	12.338
K	9.509
OH	8.570
F	0.000
P	0.016
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	0.88
C	0.00
ZR	0.00
OR	45.94
AB	21.33
AN	0.00
LC	0.00
NE	10.12
KP	0.55
HL	0.00
TH	0.00
NC	0.00
AC	2.16
NS	0.00
KS	0.00
DI	0.43
WO	5.81
HY	0.00
OL	0.00
CS	0.00
MT	2.15
CM	0.00
HM	0.55
IL	0.65
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.05
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	1.37
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.64
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	53.79	44.14
AB+NE	45.21	55.86
AN	0.00	0.00
QTZ	34.69	56.87
NE	34.75	24.09
KP	30.56	19.04
CAO+BAO+SRO	16.81	21.47
NA2O	33.71	44.71
K2O+RB2O	44.43	33.82
MGO	0.44	0.82
ALK+RB2O	80.33	79.21
FE AS FEO	19.13	19.97
FE2/FE2+FE3	27.94	27.93

OR+AB+AN	67.27
NE+LC+KP	32.73
AC+DI+HY*	0.00
OL+CS	0.00
MT+CM+HM	0.00
IL+SPH**	0.00
DIFF.IND.	91.64
SI UNSAT.	8.36

* INCLUDES NS+KS+WO AND SPOO ** INCLUDES PF AND RU

A.I. 1.025

****RP4 **** #60252

	WT.PC	MOL.PC	MOL.PR
SIO2	68.87	74.42	1.1460
TIO2	0.16	0.13	0.0020
AL2O3	15.86	10.10	0.1556
FE2O3	1.97	0.80	0.0123
FEO	0.12	0.11	0.0017
MNO	0.04	0.04	0.0006
MGO	0.32	1.32	0.0203
CAO	1.01	1.17	0.0130
NA2O	5.10	5.34	0.0823
K2O	6.69	4.61	0.0710
H2O+	0.54	1.95	0.0300
H2O-	0.00	0.00	0.0000
P2O5	0.03	0.01	0.0002
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	101.21		
LESSO	0.00		
TOTAL	101.21		

	ATOMS
SI	60.624
TI	0.106
AL	16.457
FE3	1.305
FE2	0.083
MN	0.030
MG	1.076
CA	0.953
NA	8.704
K	7.514
OH	3.171
F	0.000
P	0.022
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	11.20
C	0.00
ZR	0.00
OR	39.54
AB	43.15
AN	0.63
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	3.26
WO	0.00
HY	0.53
OL	0.00
CS	0.00
MT	0.05
CM	0.00
HM	1.93
IL	0.30
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.07
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOO	0.00
H2O+	0.54
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	101.21
FE/FE+MG	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	47.45	45.99
AB+NE	51.79	53.27
AN	0.75	0.73
QTZ	51.17	72.28
NE	24.90	14.67
KP	23.93	12.84
CAO+BAO+SRO	7.89	10.51
NA2O	39.84	48.02
K2O+RB2O	52.27	41.46
MGO	5.64	10.14
ALK+RB2O	81.07	76.44
FE AS FEO	13.29	13.42
FE2/FE2+FE3	8.28	8.30

OR+AB+AN	85.32
NE+LC+KP	0.00
AC+DI+HY*	3.77
OL+CS	0.00
MT+CM+HM	1.99
IL+SPH**	0.30
DIFF.IND.	94.59
SI UNSAT.	0.00

* INCLUDES NS+KS+WO AND SPOO ** INCLUDES PF AND RU

A.I. 0.985

****RP10X ****#60253

	WT.PC	MOL.PC	MOL.PR
SIO2	55.29	57.79	0.9200
TIO2	0.72	0.57	0.0090
AL2O3	13.70	8.45	0.1344
FE2O3	3.13	1.25	0.0199
FEO	7.21	5.12	0.1003
MNO	0.19	0.15	0.0024
MGO	4.59	9.15	0.1163
CAO	9.42	10.03	0.1530
NA2O	1.55	1.03	0.0250
K2O	1.56	1.04	0.0166
H2O+	1.30	4.55	0.0722
H2O-	0.00	0.00	0.0000
P2O5	0.13	0.06	0.0009
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.03		
LESSO	0.00		
TOTAL	99.03		

	ATOMS
SI	52.041
TI	0.510
AL	15.200
FE3	2.253
FE2	5.078
MN	0.152
MG	8.602
CA	9.501
NA	2.628
K	1.674
OH	3.163
P	0.134
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	13.26
C	0.00
ZR	0.00
OR	9.22
AB	13.11
AN	23.83
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	16.50
WO	0.00
HY	13.56
OL	0.00
CS	0.00
MT	4.61
CM	0.00
HM	0.00
IL	1.37
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.31
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.30
H2O+	1.29
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.33
FE/FE+MG	0.39
OR+AB+AN	48.15
NE+LC+KP	0.00
AC+DI+HY*	30.05
OL+CS	0.00
MT+CM+HM	4.61
IL+SPH**	1.37
DIFF.IND.	35.58
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	19.15	18.83
AB+NE	27.23	28.42
AN	53.62	52.75
QTZ	65.31	82.39
NE	19.97	10.64
KP	14.73	7.05
CAO+BAO+SRO	75.14	80.16
NA2O	12.37	11.93
K2O+RB2O	12.49	7.90
MGO	26.23	39.06
ALK+RB2O	17.13	13.72
FE AS FEO	56.59	47.21
FE2/FE2+FE3	72.14	72.15

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****RP17XA ****#60254

	WT.PC	MOL.PC	MOL.PR
SIO2	54.26	60.32	0.9029
TIO2	1.13	0.95	0.0151
AL2O3	13.45	8.85	0.1317
FE2O3	3.15	1.32	0.0210
FEO	1.04	0.97	0.0145
MNO	0.19	0.18	0.0025
MGO	3.45	5.72	0.0856
CAO	10.09	12.07	0.1799
NA2O	0.38	0.95	0.0142
K2O	5.96	4.25	0.0633
H2O+	0.45	1.53	0.0250
H2O-	0.00	0.00	0.0000
P2O5	0.71	0.34	0.0055
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.76		
LESSO	0.00		
TOTAL	99.76		

	ATOMS
SI	51.723
TI	0.810
AL	15.114
FE3	3.967
FE2	3.129
MN	3.153
MG	4.902
CA	10.307
NA	1.626
K	7.249
OH	2.362
P	0.573
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	8.10
C	0.00
ZR	0.00
OR	35.21
AB	7.45
AN	15.15
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	15.63
WO	2.70
HY	0.00
OL	0.00
CS	0.00
MT	0.79
CM	0.00
HM	7.57
IL	2.14
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	1.53
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.42
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.76
FE/FE+MG	0.00
OR+AB+AN	57.82
NE+LC+KP	0.00
AC+DI+HY*	21.23
OL+CS	0.00
MT+CM+HM	8.37
IL+SPH**	2.14
DIFF.IND.	50.77
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	60.92	60.44
AB+NE	12.83	13.56
AN	26.20	26.00
QTZ	52.63	74.16
NE	7.94	4.73
KP	39.42	21.10
CAO+BAO+SRO	59.60	69.90
NA2O	3.20	5.51
K2O+RB2O	35.20	24.58
MGO	18.30	30.31
ALK+RB2O	36.23	27.45
FE AS FEO	45.42	42.24
FE2/FE2+FE3	14.36	14.39

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****RP17XB **** #60254

	WT.PC	MOL.PC	MOL.PR
SIO2	63.37	71.55	1.0545
TIO2	0.33	0.23	0.0041
AL2O3	16.03	10.97	0.1572
FE2O3	2.85	1.21	0.0179
FEO	0.00	0.00	0.0000
MNO	0.07	0.07	0.0010
MGO	1.02	1.72	0.0253
CAO	3.12	3.78	0.0555
NA2O	1.26	1.38	0.0203
K2O	11.23	8.09	0.1192
H2O+	0.33	1.24	0.0183
H2O-	0.00	0.00	0.0000
P2O5	0.04	0.02	0.0003
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.65		
LESSO	0.00		
TOTAL	99.65		

	ATOMS
SI	59.509
TI	0.229
AL	17.447
FE3	1.950
FE2	0.000
MN	0.055
MG	1.404
CA	3.047
NA	2.255
K	13.230
OH	2.033
P	0.031
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	7.18
C	0.00
ZR	0.00
OR	66.37
AB	10.66
AN	4.92
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	5.48
WO	1.00
HY	0.00
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	2.85
IL	0.15
SPH	0.62
PF	0.00
RU	0.00
AP	0.00
HAP	0.09
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.33
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.65
FE/FE+MG	0.00
OR+AB+AN	81.95
NE+LC+KP	0.00
AC+DI+HY*	6.43
OL+CS	0.00
MT+CM+HM	2.85
IL+SPH**	0.77
DIFF.IND.	84.22
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	80.99	80.35
AB+NE	13.01	13.70
AN	6.00	5.95
QTZ	48.36	70.83
NE	6.66	4.25
KP	44.74	24.92
CAO+BAO+SRO	19.99	26.50
NA2O	8.07	10.41
K2O+RB2O	71.94	61.09
MGO	6.32	12.55
ALK+RB2O	77.39	69.25
FE AS FEO	16.32	18.20
FE2/FE2+FE3	2.66	2.69

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****RP19 **** #60255

	WT.PC	MOL.PC	MOL.PR
SIO2	59.56	66.48	0.9911
TIO2	0.76	0.64	0.0095
AL2O3	15.61	10.27	0.1531
FE2O3	3.28	1.38	0.0205
FEO	2.95	2.75	0.0411
MNO	0.11	0.10	0.0016
MGO	1.44	2.40	0.0357
CAO	4.62	5.53	0.0824
NA2O	3.82	4.13	0.0616
K2O	6.69	4.76	0.0710
H2O+	0.38	1.41	0.0211
H2O-	0.00	0.00	0.0000
P2O5	0.31	0.15	0.0022
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.53		
LESSO	0.00		
TOTAL	99.53		

	ATOMS
SI	55.690
TI	0.534
AL	17.205
FE3	2.308
FE2	2.307
MN	0.087
MG	2.007
CA	4.629
NA	6.925
K	7.982
OH	2.370
P	0.245
C	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

	CIPW NORM
QTZ	3.09
C	0.00
ZR	0.00
OR	39.54
AB	32.32
AN	5.69
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	10.65
WO	0.74
HY	0.00
OL	0.00
CS	0.00
MT	4.76
CM	0.00
HM	0.00
IL	1.44
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.73
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.37
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.55
FE/FE+MG	0.26
OR+AB+AN	77.55
NE+LC+KP	0.00
AC+DI+HY*	11.59
OL+CS	0.00
MT+CM+HM	4.76
IL+SPH**	1.44
DIFF.IND.	74.95
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	50.99	49.71
AB+NE	41.68	43.13
AN	7.34	7.16
QTZ	46.66	69.69
NE	23.35	14.55
KP	29.93	16.77
CAO+BAO+SRO	30.54	38.31
NA2O	25.25	28.66
K2O+RB2O	44.22	33.03
MGO	9.02	14.17
ALK+RB2O	53.51	52.63
FE AS FEO	33.47	33.20
FE2/FE2+FE3	50.90	50.92

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.887

****RP20COL **** #60256

	WT.PC	MOL.PC	MOL.PR		ATOMS
SIO2	63.90	70.77	1.0633	SI	57.947
TIO2	0.28	0.33	0.0035	TI	0.191
AL2O3	17.61	11.50	0.1727	AL	18.792
FE2O3	2.03	0.85	0.0127	FE3	1.383
FEO	0.26	0.24	0.0036	FE2	0.197
MNO	0.04	0.04	0.0006	MN	0.031
MGO	0.50	0.83	0.0124	MG	0.675
CAO	0.96	1.14	0.0171	CA	0.931
NA2O	6.42	6.89	0.1036	NA	11.263
K2O	6.39	4.52	0.0679	K	7.381
H2O+	0.81	2.99	0.0450	OH	4.892
H2O-	0.00	0.00	0.0000		0.000
P2O5	0.03	0.01	0.0002	P	0.023
CO2	0.00	0.00	0.0000	C	0.000
OTHER	0.00	0.00	0.0000		0.000
ZRO2	0.00	0.00	0.0000	ZR	0.000
CR2O3	0.00	0.00	0.0000	CR	0.000
V2O3	0.00	0.00	0.0000	V	0.000
NIO	0.00	0.00	0.0000	NI	0.000
COO	0.00	0.00	0.0000	CO	0.000
BAO	0.00	0.00	0.0000	BA	0.000
SRO	0.00	0.00	0.0000	SR	0.000
F	0.00	0.00	0.0000	F	0.000
CL	0.00	0.00	0.0000	CL	0.000
SO3	0.00	0.00	0.0000	S	0.000
S	0.00	0.00	0.0000	S	0.000
LI2O	0.00	0.00	0.0000	LI	0.000
RB2O	0.00	0.00	0.0000	RB	0.000
TOTAL	99.23			O	160.000
LESSO	0.00				
TOTAL	99.23				

CIPW NORM	
QTZ	0.29
C	0.00
ZR	0.00
OR	37.77
AB	54.32
AN	0.37
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	2.69
WO	0.31
HY	0.00
OL	0.00
CS	0.00
MT	0.16
CM	0.00
HM	1.92
IL	0.53
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.07
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.81
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.23
FE/FE+MG	0.00
OR+AB+AN	92.45
NE+LC+KP	0.00
AC+DI+HY*	3.00
OL+CS	0.00
MT+CM+HM	2.08
IL+SPH**	0.53
DIFF.IND.	92.36
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	40.85	39.43
AB+NE	58.75	60.19
AN	0.40	0.38
QTZ	44.91	66.82
NE	31.85	20.05
KP	23.23	13.13
CAO+BAO+SRO	6.97	9.08
NA2O	46.62	54.93
K2O+RB2O	46.41	35.99
MGO	3.24	5.81
ALK+RB2O	82.93	80.32
FE AS FEO	13.73	13.87
FE2/FE2+FE3	14.11	14.13

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.992

****RP20PLE **** #60257

	WT.PC	MOL.PC	MOL.PR		ATOMS
SIO2	63.89	71.32	1.0632	SI	58.344
TIO2	0.13	0.11	0.0016	TI	0.089
AL2O3	18.10	11.86	0.1775	AL	19.444
FE2O3	0.90	0.39	0.0056	FE3	0.619
FEO	0.25	0.23	0.0035	FE2	0.191
MNO	0.01	0.01	0.0001	MN	0.008
MGO	0.23	0.39	0.0057	MG	0.313
CAO	1.37	1.67	0.0243	CA	1.360
NA2O	1.26	1.37	0.0203	NA	2.231
K2O	11.87	8.49	0.1260	K	13.851
H2O+	1.01	3.73	0.0561	OH	6.153
H2O-	0.00	0.00	0.0000		0.000
P2O5	0.00	0.00	0.0000	P	0.000
CO2	0.00	0.00	0.0000	C	0.000
OTHER	0.00	0.00	0.0000		0.000
ZRO2	0.00	0.00	0.0000	ZR	0.000
CR2O3	0.00	0.00	0.0000	CR	0.000
V2O3	0.00	0.00	0.0000	V	0.000
NIO	0.00	0.00	0.0000	NI	0.000
COO	0.00	0.00	0.0000	CO	0.000
BAO	0.00	0.00	0.0000	BA	0.000
SRO	0.00	0.00	0.0000	SR	0.000
F	0.00	0.00	0.0000	F	0.000
CL	0.00	0.00	0.0000	CL	0.000
SO3	0.00	0.00	0.0000	S	0.000
S	0.00	0.00	0.0000	S	0.000
LI2O	0.00	0.00	0.0000	LI	0.000
RB2O	0.00	0.00	0.0000	RB	0.000
TOTAL	99.04			O	160.000
LESSO	0.00				
TOTAL	99.04				

CIPW NORM	
QTZ	7.80
C	0.65
ZR	0.00
OR	70.16
AB	10.65
AN	6.90
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.57
OL	0.00
CS	0.00
MT	0.46
CM	0.00
HM	0.58
IL	0.25
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.01
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.04
FE/FE+MG	0.00
OR+AB+AN	87.71
NE+LC+KP	0.00
AC+DI+HY*	0.57
OL+CS	0.00
MT+CM+HM	1.04
IL+SPH**	0.25
DIFF.IND.	88.62
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	79.93	79.39
AB+NE	12.15	12.80
AN	7.85	7.81
QTZ	48.50	70.96
NE	6.52	4.03
KP	44.93	25.01
CAO+BAO+SRO	9.57	14.48
NA2O	8.68	11.88
K2O+RB2O	81.75	73.64
MGO	1.59	3.42
ALK+RB2O	90.99	87.65
FE AS FEO	7.41	8.92
FE2/FE2+FE3	24.30	24.31

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.824

****RP20DK **** #60258

	WT.PC	MOL.PC	MOL.PR		ATOMS
SIO2	52.19	55.35	0.8685	SI	50.754
TIO2	0.76	0.61	0.0095	TI	0.556
AL2O3	12.80	8.00	0.1255	AL	14.674
FE2O3	4.12	1.66	0.0258	FE3	3.015
FEO	5.62	5.03	0.0782	FE2	4.571
MNO	0.22	0.20	0.0031	MN	0.181
MGO	4.87	7.77	0.1208	MG	7.059
CAO	8.08	9.27	0.1441	CA	8.420
NA2O	0.53	0.55	0.0085	NA	0.999
K2O	6.94	4.74	0.0737	K	8.612
H2O+	1.74	6.21	0.0966	OH	11.289
H2O-	0.00	0.00	0.0000		0.000
P2O5	0.08	0.04	0.0006	P	0.066
CO2	0.00	0.00	0.0000	C	0.000
OTHER	0.00	0.00	0.0000		0.000
ZRO2	0.00	0.00	0.0000	ZR	0.000
CR2O3	0.00	0.00	0.0000	CR	0.000
V2O3	0.00	0.00	0.0000	V	0.000
NIO	0.00	0.00	0.0000	NI	0.000
COO	0.00	0.00	0.0000	CO	0.000
BAO	0.00	0.00	0.0000	BA	0.000
SRO	0.00	0.00	0.0000	SR	0.000
F	0.00	0.00	0.0000	F	0.000
CL	0.00	0.00	0.0000	CL	0.000
SO3	0.00	0.00	0.0000	S	0.000
S	0.00	0.00	0.0000	S	0.000
LI2O	0.00	0.00	0.0000	LI	0.000
RB2O	0.00	0.00	0.0000	RB	0.000
TOTAL	97.95			O	160.000
LESSO	0.00				
TOTAL	97.95				

CIPW NORM	
QTZ	1.37
C	0.00
ZR	0.00
OR	41.02
AB	4.45
AN	12.05
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	22.28
WO	0.00
HY	7.41
OL	0.00
CS	0.00
MT	5.97
CM	0.00
HM	0.00
IL	1.44
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.19
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.74
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	97.95
FE/FE+MG	0.28
OR+AB+AN	57.55
NE+LC+KP	0.00
AC+DI+HY*	29.69
OL+CS	0.00
MT+CM+HM	5.97
IL+SPH**	1.44
DIFF.IND.	46.87
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	71.27	70.92
AB+NE	7.79	8.23
AN	20.94	20.85
QTZ	45.09	68.14
NE	5.18	3.31
KP	49.73	28.55
CAO+BAO+SRO	51.96	63.67
NA2O	3.41	3.78
K2O+RB2O	44.63	32.56
MGO	22.25	35.96
ALK+RB2O	34.13	24.43
FE AS FEO	43.62	39.57
FE2/FE2+FE3	61.17	61.18

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****RP25 **** #60259

	WT.PC	MOL.PC	MOL.PR		ATOMS
SIO2	60.27	67.12	1.0029	SI	55.517
TIO2	0.57	0.48	0.0071	TI	0.395
AL2O3	17.25	11.32	0.1692	AL	18.731
FE2O3	3.63	1.52	0.0227	FE3	2.517
FEO	1.55	1.44	0.0216	FE2	1.194
MNO	0.13	0.12	0.0018	MN	0.101
MGO	0.54	0.90	0.0134	MG	0.741
CAO	3.86	4.61	0.0688	CA	3.810
NA2O	3.10	3.35	0.0500	NA	5.536
K2O	8.27	5.88	0.0878	K	9.720
H2O+	0.87	3.23	0.0483	OH	5.346
H2O-	0.00	0.00	0.0000		0.000
P2O5	0.08	0.04	0.0006	P	0.062
CO2	0.00	0.00	0.0000	C	0.000
OTHER	0.00	0.00	0.0000		0.000
ZRO2	0.00	0.00	0.0000	ZR	0.000
CR2O3	0.00	0.00	0.0000	CR	0.000
V2O3	0.00	0.00	0.0000	V	0.000
NIO	0.00	0.00	0.0000	NI	0.000
COO	0.00	0.00	0.0000	CO	0.000
BAO	0.00	0.00	0.0000	BA	0.000
SRO	0.00	0.00	0.0000	SR	0.000
F	0.00	0.00	0.0000	F	0.000
CL	0.00	0.00	0.0000	CL	0.000
SO3	0.00	0.00	0.0000	S	0.000
S	0.00	0.00	0.0000	S	0.000
LI2O	0.00	0.00	0.0000	LI	0.000
RB2O	0.00	0.00	0.0000	RB	0.000
TOTAL	100.12			O	160.000
LESSO	0.00				
TOTAL	100.12				

CIPW NORM	
QTZ	3.37
C	0.00
ZR	0.00
OR	48.83
AB	26.23
AN	8.78
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	2.90
WO	2.53
HY	0.00
OL	0.00
CS	0.00
MT	3.77
CM	0.00
HM	1.03
IL	1.08
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.19
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.87
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.12
FE/FE+MG	0.00
OR+AB+AN	83.84
NE+LC+KP	0.00
AC+DI+HY*	5.43
OL+CS	0.00
MT+CM+HM	4.80
IL+SPH**	1.08
DIFF.IND.	78.43
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	58.30	57.20
AB+NE	31.29	32.58
AN	10.41	10.22
QTZ	46.84	69.07
NE	17.99	11.22
KP	35.17	19.70
CAO+BAO+SRO	25.34	33.31
NA2O	20.35	24.20
K2O+RB2O	54.30	42.49
MGO	3.20	6.09
ALK+RB2O	67.45	62.62
FE AS FEO	29.34	31.29
FE2/FE2+FE3	33.96	33.99

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.814

****RP30 **** #60260

	WT.PC	MOL.PC	MOL.PR
SIO2	52.68	60.73	0.8768
TIO2	1.15	1.00	0.0121
AL2O3	12.35	8.39	0.1211
FE2O3	11.95	5.18	0.0743
FEO	0.00	0.00	0.0000
MNO	0.17	0.17	0.0024
MGO	4.64	7.97	0.1151
CAO	7.60	9.63	0.1391
NA2O	1.58	1.77	0.0255
K2O	6.32	4.65	0.0671
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	1.05	0.51	0.0074
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.70		
LESSO	0.00		
TOTAL	99.70		

	ATOMS
SI	50.495
TI	0.828
AL	14.062
FE3	3.687
FE2	0.000
MN	0.149
MG	6.660
CA	8.075
NA	2.959
K	7.760
OH	0.000
	0.000
	0.000
P	0.359
C	0.000
	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	1.60
C	0.00
ZR	0.00
OR	37.35
AB	13.37
AN	7.94
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	16.00
WO	0.00
HY	4.14
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	11.95
IL	0.36
SPH	2.35
PF	0.00
RU	0.00
AP	0.00
HAP	2.48
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	-0.04
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.70
FE/FE+MG	0.00
OR+AB+AN	58.66
NE+LC+KP	0.00
AC+DI+HY*	20.14
OL+CS	0.00
MT+CM+HM	11.95
IL+SPH**	2.71
DIFF.IND.	54.52
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	63.63	62.79
AB+NE	22.79	23.85
AN	13.54	13.36
QTZ	47.79	70.07
NE	13.23	8.24
KP	38.93	21.69
CAO+BAO+SRO	49.63	60.04
NA2O	10.06	11.00
K2O+RB2O	40.25	29.96
SO	19.78	31.99
ALK+RB2O	33.67	25.74
FE AS FEO	46.55	42.27
FE2/FE2+FE3	1.56	1.58

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

****S4 **** #60261

	WT.PC	MOL.PC	MOL.PR
SIO2	68.49	76.61	1.1466
TIO2	0.13	0.11	0.0016
AL2O3	14.75	9.73	0.1456
FE2O3	7.93	3.33	0.0208
FEO	0.00	0.00	0.0000
MNO	0.02	0.02	0.0003
MGO	0.05	0.05	0.0007
CAO	0.79	0.95	0.0125
NA2O	4.41	5.13	0.0776
K2O	6.15	4.55	0.0553
H2O+	0.63	2.34	0.0350
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.04		
LESSO	0.00		
TOTAL	98.04		

	ATOMS
SI	61.984
TI	0.048
AL	15.753
FE3	1.339
FE2	0.000
MN	0.015
MG	0.040
CA	0.075
NA	0.392
K	7.052
OH	3.792
	0.000
	0.000
P	0.000
C	0.000
	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	16.41
C	0.00
ZR	0.00
OR	36.35
AB	40.77
AN	0.00
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.15
WO	0.00
HY	0.00
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	1.83
IL	0.24
SPH	0.26
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.63
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.04
FE/FE+MG	0.00
OR+AB+AN	77.52
NE+LC+KP	0.00
AC+DI+HY*	1.05
OL+CS	0.00
MT+CM+HM	1.53
IL+SPH**	0.31
DIFF.IND.	93.46
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	46.71	45.26
AB+NE	32.33	53.73
AN	0.99	0.96
QTZ	54.31	74.72
NE	23.59	13.73
KP	22.10	11.55
CAO+BAO+SRO	6.03	8.03
NA2O	41.25	49.94
K2O+RB2O	52.74	42.03
MGO	0.24	0.45
ALK+RB2O	56.59	85.65
FE AS FEO	13.17	13.91
FE2/FE2+FE3	1.20	1.22

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.981

****S10 **** #60262

	WT.PC	MOL.PC	MOL.PR
SIO2	62.83	71.45	1.0455
TIO2	0.58	0.50	0.0073
AL2O3	15.46	10.36	0.1516
FE2O3	3.14	1.34	0.0197
FEO	0.00	0.00	0.0000
MNO	0.03	0.03	0.0004
MGO	0.92	1.56	0.0228
CAO	2.47	3.01	0.0440
NA2O	2.30	2.54	0.0371
K2O	10.02	7.27	0.1064
H2O+	0.50	1.90	0.0278
H2O-	0.00	0.00	0.0000
P2O5	0.09	0.04	0.0006
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.34		
LESSO	0.00		
TOTAL	98.34		

	ATOMS
SI	58.468
TI	0.406
AL	16.959
FE3	2.199
FE2	0.000
MN	0.024
MG	1.276
CA	2.463
NA	4.149
K	11.393
OH	3.104
	0.000
	0.000
P	0.071
C	0.000
	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
C	160.000

CIPW NORM	
QTZ	6.72
C	0.00
ZR	0.00
OR	59.22
AB	19.46
AN	2.27
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	4.94
WO	0.46
HY	0.00
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	3.14
IL	0.06
SPH	1.34
PF	0.00
RU	0.00
AP	0.00
HAP	0.21
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.50
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	98.34
FE/FE+MG	0.00
OR+AB+AN	80.95
NE+LC+KP	0.00
AC+DI+HY*	5.42
OL+CS	0.00
MT+CM+HM	3.14
IL+SPH**	1.40
DIFF.IND.	85.40
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	73.16	72.09
AB+NE	24.04	25.14
AN	2.80	2.76
QTZ	48.25	70.50
NE	12.34	7.63
KP	39.41	21.87
CAO+BAO+SRO	15.70	23.49
NA2O	16.55	19.78
K2O+RB2O	67.75	56.73
MGO	5.72	11.07
ALK+RB2O	75.54	69.64
FE AS FEO	17.74	19.29
FE2/FE2+FE3	1.05	1.06

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.947

****K44 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	59.48	67.35	0.9893
TIO2	0.25	0.21	0.0035
AL2O3	22.73	15.10	0.2229
FE2O3	3.07	1.50	0.0192
FEO	0.25	0.25	0.0039
MNO	0.16	0.15	0.0023
MGO	0.01	0.02	0.0002
CAO	1.52	1.84	0.0271
NA2O	4.30	4.73	0.0694
K2O	8.12	5.34	0.0562
H2O+	0.93	3.50	0.0516
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.83		
LESSO	0.00		
TOTAL	100.83		

	ATOMS
SI	53.615
TI	0.190
AL	24.152
FE3	2.053
FE2	0.211
MN	0.122
MG	1.013
CA	1.468
NA	7.515
K	9.340
OH	5.593
	0.000
	0.000
P	0.000
C	0.000
	0.000
	0.000
ZR	0.000
CR	0.000
V	0.000
NI	0.000
CO	0.000
BA	0.000
SR	0.000
F	0.000
CL	0.000
S	0.000
S	0.000
LI	0.000
RB	0.000
O	160.000

CIPW NORM	
QTZ	0.11
C	4.13
ZR	0.00
OR	47.99
AB	36.55
AN	7.54
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.02
OL	0.00
CS	0.00
MT	0.61
CM	0.00
HM	2.85
IL	0.53
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.95
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	100.88
FE/FE+MG	0.00
OR+AB+AN	91.92
NE+LC+KP	0.00
AC+DI+HY*	0.02
OL+CS	0.00
MT+CM+HM	3.25
IL+SPH**	0.53
DIFF.IND.	84.49
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	52.21	50.97
AB+NE	39.53	41.01
AN	8.27	8.01
QTZ	44.40	66.73
NE	23.33	14.83
KP	32.25	18.45
CAO+BAO+SRO	10.90	14.84
NA2O	30.85	37.97
K2O+RB2O	54.25	47.19
MGO	0.06	0.12
ALK+RB2O	79.45	77.52
FE AS FEO	20.47	22.25
FE2/FE2+FE3	13.70	13.80

* INCLUDES NS,KS,WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.698

****X442 ****#60263

	WT.PC	MOL.PC	MOL.PR
SIO2	60.04	66.37	0.9941
TIO2	0.35	0.29	0.0034
AL2O3	17.73	11.94	0.1739
FE2O3	2.89	1.21	0.0161
FEO	0.23	0.26	0.0033
MNO	0.15	0.14	0.0021
MGO	0.46	0.76	0.0114
CAO	1.50	1.77	0.0267
NA2O	6.83	7.37	0.1102
K2O	7.90	5.61	0.0839
H2O+	1.09	4.03	0.0605
H2O-	0.00	0.00	0.0000
P2O5	0.06	0.03	0.0004
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.23		
LESS O	0.00		
TOTAL	99.23		

	ATOMS		
SI	55.457		
TI	0.248		
AL	19.305		
FE3	2.009		
FE2	3.216		
MN	0.117		
MG	0.633		
CA	1.445		
NA	12.231		
K	9.311		
OH	6.717		
	0.000		
	0.000		
P	0.047		
C	0.000		
	0.000		
	0.000		
ZR	0.000		
CR	0.000		
V	0.000		
NI	0.000		
CO	0.000		
BA	0.000		
SR	0.000		
F	0.000		
CL	0.000		
S	0.000		
LI	0.000		
RB	0.000		
O	160.000		

	CIPW NORM
QTZ	0.00
C	0.00
ZR	0.00
OR	46.69
AB	26.54
AN	0.00
LC	0.00
NE	11.20
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	8.36
NS	0.25
KS	0.00
DI	3.03
WO	1.36
HY	0.00
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	0.00
IL	0.57
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.14
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	1.09
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.23
FE/FE+MG	0.17
OR+AB+AN	73.23
NE+LC+KP	11.20
AC+DI+HY*	13.00
OL+CS	0.00
MT+CM+HM	0.00
IL+SPH**	0.57
DIFF.IND.	84.43
SI UNSAT.	9.48

RATIOS	WT.PC	MOL.PC
OR+LC+KP	55.30	48.23
AB+NE	44.70	51.77
AN	0.00	0.00
QTZ	38.23	60.73
NE	30.29	20.33
KP	31.42	18.94
CAO+BAO+SRO	9.24	12.11
NA2O	42.03	49.90
K2O+RB2O	48.63	37.99
MGO	2.52	4.61
ALK+RB2O	30.84	73.35
FE AS FEO	16.63	17.04
FE2/FE2+FE3	14.19	14.24

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 1.116

****X50 ****

	WT.PC	MOL.PC	MOL.PR
SIO2	63.27	73.99	1.0528
TIO2	0.49	0.43	0.0061
AL2O3	17.98	12.17	0.1754
FE2O3	1.78	0.77	0.0111
FEO	0.00	0.00	0.0000
MNO	0.02	0.02	0.0003
MGO	0.52	0.90	0.0129
CAO	1.31	1.62	0.0234
NA2O	3.33	3.73	0.0537
K2O	9.76	7.19	0.1036
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	0.16	0.08	0.0011
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	98.52		
LESS O	0.00		
TOTAL	99.52		

	ATOMS		
SI	58.552		
TI	0.341		
AL	19.505		
FE3	1.240		
FE2	0.000		
MN	0.016		
MG	0.717		
CA	1.269		
NA	5.975		
K	11.525		
OH	0.000		
	0.000		
P	0.125		
C	0.000		
	0.000		
	0.000		
ZR	0.000		
CR	0.000		
V	0.000		
NI	0.000		
CO	0.000		
BA	0.000		
SR	0.000		
F	0.000		
CL	0.000		
SO3	0.000		
S	0.000		
LI	0.000		
RB	0.000		
O	160.000		

	CIPW NORM
QTZ	3.50
C	0.00
ZR	0.00
OR	57.69
AB	24.17
AN	5.02
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.30
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	1.30
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	1.78
IL	0.04
SPH	0.31
PF	0.00
RU	0.34
AP	0.00
HAP	0.38
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.01
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.52
FE/FE+MG	0.00
OR+AB+AN	90.88
NE+LC+KP	0.00
AC+DI+HY*	1.30
OL+CS	0.00
MT+CM+HM	1.78
IL+SPH**	0.69
DIFF.IND.	82.37
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	63.46	62.29
AB+NE	31.00	32.29
AN	5.52	5.42
QTZ	46.24	68.61
NE	17.03	10.72
KP	35.63	20.68
CAO+BAO+SRO	9.10	12.93
NA2O	23.13	29.73
K2O+RB2O	67.75	57.35
MGO	3.41	6.69
ALK+RB2O	85.94	81.60
FE AS FEO	10.65	11.71
FE2/FE2+FE3	1.23	1.25

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.897

****X502 **** #60264

	WT.PC	MOL.PC	MOL.PR
SIO2	52.12	67.34	1.0337
TIO2	0.25	0.23	0.0035
AL2O3	20.04	12.90	0.1965
FE2O3	1.32	0.75	0.0114
FEO	0.14	0.13	0.0019
MNO	0.02	0.02	0.0003
MGO	0.20	0.33	0.0050
CAO	0.26	0.30	0.0046
NA2O	4.66	4.93	0.0752
K2O	7.45	5.19	0.0791
H2O+	2.02	7.35	0.1121
H2O-	0.00	0.00	0.0000
P2O5	0.04	0.02	0.0003
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.05		
LESS O	0.00		
TOTAL	99.05		

	ATOMS		
SI	55.540		
TI	0.198		
AL	21.121		
FE3	1.225		
FE2	0.105		
MN	0.015		
MG	0.257		
CA	0.249		
NA	9.078		
K	5.499		
OH	12.649		
	0.000		
P	0.030		
C	0.000		
	0.000		
	0.000		
ZR	0.000		
CR	0.000		
V	0.000		
NI	0.000		
CO	0.000		
BA	0.000		
SR	0.000		
F	0.000		
CL	0.000		
S	0.000		
LI	0.000		
RB	0.000		
O	160.000		

	CIPW NORM
QTZ	5.76
C	3.93
ZR	0.00
OR	44.03
AB	39.43
AN	1.03
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.50
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	1.82
IL	0.34
SPH	0.00
PF	0.00
RU	0.10
AP	0.00
HAP	0.09
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	2.02
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.05
FE/FE+MG	0.00
OR+AB+AN	84.49
NE+LC+KP	0.00
AC+DI+HY*	0.50
OL+CS	0.00
MT+CM+HM	1.82
IL+SPH**	0.44
DIFF.IND.	89.22
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	52.12	50.67
AB+NE	46.67	48.15
AN	1.22	1.18
QTZ	48.01	69.79
NE	23.94	14.72
KP	28.05	15.49
CAO+BAO+SRO	2.10	2.92
NA2O	57.67	47.31
K2O+RB2O	90.23	49.78
MGO	1.42	2.69
ALK+RB2O	35.84	93.73
FE AS FEO	12.74	13.58
FE2/FE2+FE3	8.90	8.91

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. 0.785

S1

	WT.PC	MOL.PC	MOL.PR
SIO2	69.89	75.53	1.1530
TIO2	0.00	0.00	0.0000
AL2O3	18.45	11.74	0.1812
FE2O3	0.00	0.00	0.0000
FEO	2.41	2.18	0.0303
MNO	0.00	0.00	0.0000
MGO	0.43	0.78	0.0107
CAO	5.11	5.97	0.0911
NA2O	1.91	1.61	0.0244
K2O	2.15	1.49	0.0228
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
OTHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O3	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	99.35		
LESS O	0.00		
TOTAL	99.35		

	ATOMS		
SI	60.817		
TI	0.000		
AL	19.031		
FE3	0.000		
FE2	1.931		
MN	0.000		
MG	0.561		
CA	3.956		
NA	3.253		
K	2.388		
OH	0.000		
	0.000		
P	0.000		
C	0.000		
	0.000		
	0.000		
ZR	0.000		
CR	0.000		
V	0.000		
NI	0.000		
CO	0.000		
BA	0.000		
SR	0.000		
F	0.000		
CL	0.000		
S	0.000		
LI	0.000		
RB	0.000		
O	160.000		

	CIPW NORM
QTZ	3.[illegible]
C	0.00
ZR	0.00
OR	14.[illegible]
AB	27.[illegible]
AN	25.[illegible]
LC	0.00
NE	0.00
KP	0.00
HL	0.00
TH	0.00
NC	0.00
AC	0.00
NS	0.00
KS	0.00
DI	0.00
WO	0.00
HY	0.00
OL	0.00
CS	0.00
MT	0.00
CM	0.00
HM	0.00
IL	0.00
SPH	0.00
PF	0.00
RU	0.00
AP	0.00
HAP	0.00
FL	0.00
PY	0.00
CC	0.00
MAGN	0.00
CHALY	0.00
SPOD	0.00
H2O+	0.00
H2O-	0.00
OTHERS	0.00
SI.DEF.	0.00
TOTAL	99.[illegible]
FE/FE+MG	0.00
OR+AB+AN	99.[illegible]
NE+LC+KP	0.00
AC+DI+HY*	0.00
OL+CS	0.00
MT+CM+HM	0.00
IL+SPH**	0.00
DIFF.IND.	99.[illegible]
SI UNSAT.	0.00

RATIOS	WT.PC	MOL.PC
OR+LC+KP	16.[illegible]	14.[illegible]
AB+NE	83.[illegible]	85.[illegible]
AN	25.[illegible]	25.[illegible]
QTZ	7[illegible].[illegible]	55.[illegible]
NE	0.00	0.00
KP	14.[illegible]	11.[illegible]
CAO+BAO+SRO	5[illegible].[illegible]	65.[illegible]
NA2O	37.[illegible]	37.[illegible]
K2O+RB2O	46.[illegible]	46.[illegible]
MGO	5.32	11.[illegible]
ALK+RB2O	53.[illegible]	49.[illegible]
FE AS FEO	40.[illegible]	39.[illegible]
FE2/FE2+FE3	100.00	100.00

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. = 0.259

CY120

	WT.PC	MOL.PC	MOL.PR
SIO2	65.31	72.15	1.0768
TIO2	0.33	0.15	0.0018
AL2O3	16.03	11.70	0.1753
FE2O3	1.53	0.84	0.0106
FEO	1.17	1.08	0.0150
MNO	0.06	0.06	0.0007
MGO	0.96	1.55	0.0383
CAO	4.17	4.94	0.0879
NA2O	4.02	4.14	0.0667
K2O	3.42	2.41	0.0256
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	0.13	0.04	0.0009
CO2	0.00	0.00	0.0000
OTHERS	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O5	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.00		
LESS O	0.00		
TOTAL	100.00		

	ATOMS
SI	58.401
TI	0.221
AL	12.332
ZR	0.000
OR	20.246
AB	34.009
AN	13.227
LC	0.000
NE	0.000
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	1.778
WO	0.000
HY	1.355
OL	0.000
CS	0.000
MT	2.222
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	-0.000
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	100.000
FE/FE+MG	0.470

RATIOS	WT.PC	MOL.PC
OR+LC+KP	25.03	25.43
AB+NE	50.36	51.85
AN	23.04	22.85
QTZ	25.23	25.94
NE	25.34	26.17
KP	13.39	7.57
CAO+BAO+SRO	35.23	41.30
NA2O	37.20	39.43
K2O+RB2O	27.57	19.25
MGO	3.11	13.63
ALN+RB2O	53.49	65.04
FE AS FEO	22.43	21.29
FE2/FE2+FE3	47.06	47.08

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. = 0.628

CY1231/1

	WT.PC	MOL.PC	MOL.PR
SIO2	54.51	56.74	0.9439
TIO2	0.31	0.24	0.0039
AL2O3	20.77	13.96	0.2323
FE2O3	1.23	0.53	0.0077
FEO	1.10	1.15	0.0159
MNO	0.10	0.10	0.0014
MGO	0.34	0.53	0.0134
CAO	2.72	3.03	0.0539
NA2O	7.06	7.14	0.1149
K2O	7.66	5.77	0.0613
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	0.06	0.03	0.0004
CO2	0.00	0.00	0.0000
OTHERS	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O5	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.00		
LESS O	0.00		
TOTAL	100.00		

	ATOMS
SI	56.479
TI	0.144
AL	22.727
ZR	0.000
OR	34.364
AB	24.441
AN	0.861
LC	0.000
NE	1.775
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
OL	0.000
CS	0.000
MT	1.790
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	-0.000
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	100.000
FE/FE+MG	0.443

RATIOS	WT.PC	MOL.PC
OR+LC+KP	51.49	42.06
AB+NE	46.62	55.34
AN	1.93	1.62
QTZ	34.33	56.46
NE	35.87	24.95
KP	29.60	18.61
CAO+BAO+SRO	15.42	17.77
NA2O	39.84	45.93
K2O+RB2O	44.94	36.23
MGO	1.95	3.56
ALN+RB2O	84.92	82.32
FE AS FEO	13.15	13.54
FE2/FE2+FE3	52.01	52.03

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. = 0.968

CY18A (amphibole from inclusion)

	WT.PC	MOL.PC	MOL.PR
SIO2	43.55	46.30	0.7727
TIO2	0.73	0.58	0.0097
AL2O3	12.26	7.68	0.1282
FE2O3	3.91	1.91	0.0319
FEO	11.36	10.08	0.1402
MNO	0.24	0.21	0.0035
MGO	11.12	17.34	0.2895
CAO	11.76	13.38	0.2235
NA2O	1.72	1.77	0.0296
K2O	1.22	0.83	0.0139
H2O+	0.00	3.70	0.0618
H2O-	0.00	0.00	0.0000
P2O5	0.00	0.00	0.0000
CO2	0.00	0.00	0.0000
LITHER	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O5	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	97.46		
LESS O	0.00		
TOTAL	97.46		

	ATOMS
SI	6.934
TI	0.086
AL	14.911
ZR	0.000
OR	0.000
AB	0.000
AN	0.000
LC	0.000
NE	0.000
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	2.733
WO	0.000
HY	0.000
OL	0.000
CS	0.000
MT	0.000
CM	0.000
HM	0.000
IL	0.000
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	0.000
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	100.000
FE/FE+MG	0.000

RATIOS	WT.PC	MOL.PC
OR+LC+KP	13.31	16.15
AB+NE	54.97	54.17
AN	56.63	49.73
QTZ	5.23	51.23
NE	40.62	23.06
KP	24.32	15.61
CAO+BAO+SRO	10.03	33.79
NA2O	11.53	11.11
K2O+RB2O	1.34	5.20
MGO	3.47	26.76
ALN+RB2O	1.11	7.72
FE AS FEO	31.40	36.54
FE2/FE2+FE3	90.13	90.13

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

CY180 62

	WT.PC	MOL.PC	MOL.PR
SIO2	64.16	72.59	1.0577
TIO2	0.79	0.57	0.0198
AL2O3	22.07	14.72	0.2164
FE2O3	1.06	0.45	0.0066
FEO	3.71	3.51	0.0519
MNO	0.04	0.04	0.0006
MGO	1.64	2.77	0.0407
CAO	0.06	0.10	0.0015
NA2O	1.41	1.55	0.0227
K2O	4.91	3.54	0.0521
H2O+	0.00	0.00	0.0000
H2O-	0.00	0.00	0.0000
P2O5	0.13	0.06	0.0009
CO2	0.00	0.00	0.0000
OTHERS	0.00	0.00	0.0000
ZRO2	0.00	0.00	0.0000
CR2O3	0.00	0.00	0.0000
V2O5	0.00	0.00	0.0000
NIO	0.00	0.00	0.0000
COO	0.00	0.00	0.0000
BAO	0.00	0.00	0.0000
SRO	0.00	0.00	0.0000
F	0.00	0.00	0.0000
CL	0.00	0.00	0.0000
SO3	0.00	0.00	0.0000
S	0.00	0.00	0.0000
LI2O	0.00	0.00	0.0000
RB2O	0.00	0.00	0.0000
TOTAL	100.00		
LESS O	0.00		
TOTAL	100.00		

	ATOMS
SI	56.979
TI	0.524
AL	23.103
ZR	0.000
OR	4.709
AB	2.756
AN	0.032
LC	0.000
NE	0.000
KP	0.000
HL	0.000
TH	0.000
NC	0.000
AC	0.000
NS	0.000
KS	0.000
DI	0.000
WO	0.000
HY	0.000
OL	0.000
CS	0.000
MT	1.540
CM	0.000
HM	0.000
IL	1.490
SPH	0.000
PF	0.000
RU	0.000
AP	0.000
HAP	0.000
FL	0.000
PY	0.000
CC	0.000
MAGN	0.000
CHALY	0.000
SPOD	0.000
H2O+	-0.000
H2O-	0.000
OTHERS	0.000
SI.DEF.	0.000
TOTAL	100.000
FE/FE+MG	0.470

RATIOS	WT.PC	MOL.PC
OR+LC+KP	71.54	77.31
AB+NE	23.46	20.69
AN	-1.01	-1.00
QTZ	65.86	84.94
NE	3.77	2.51
KP	29.37	19.43
CAO+BAO+SRO	1.32	1.91
NA2O	23.02	29.73
K2O+RB2O	75.65	68.26
MGO	12.97	22.51
ALN+RB2O	49.63	41.33
FE AS FEO	37.15	36.17
FE2/FE2+FE3	79.73	79.74

* INCLUDES NS+KS+WO AND SPOD ** INCLUDES PF AND RU

A.I. = 0.346

AMPH2A

AMPH2B

	WT.PC	MOL.PC	MOL.PR		ATOMS		CTPX	NORM		WT.PC	MOL.PC	MOL.PR		ATOMS		CTPX	NORM
SIO2	49.41	52.45	0.8730	SI	47.737	QTZ	0.00		SIO2	49.92	52.91	0.8809	SI	48.405	QTZ		0.00
TIO2	0.49	0.39	0.0049	TI	0.234	C	0.00		TIO2	0.47	0.37	0.0047	TI	0.223	C		0.00
AL2O3	14.97	9.37	0.1463	AL	13.782	CO	0.00		AL2O3	14.63	9.14	0.1353	AL	13.779	CO		0.00
FE2O3	3.03	1.81	0.0113	FE3	2.027	FE2O3	3.50		FE2O3	3.31	1.91	0.0119	FE3	2.065	FE2O3		0.00
FEO	7.83	6.59	0.1197	FE2	6.291	FEO	7.83		FEO	7.50	6.31	0.1146	FE2	6.075	FEO		0.00
MNO	0.21	0.18	0.0026	MN	0.171	MNO	0.35		MNO	0.20	0.17	0.0025	MN	0.163	MNO		0.00
MGO	9.35	14.55	0.3621	MG	13.632	MGO	8.79		MGO	8.93	13.95	0.3473	MG	13.509	MGO		0.00
CAO	11.77	13.01	0.2324	CA	12.208	CAO	10.11		CAO	11.77	13.03	0.2327	CA	12.275	CAO		0.00
NA2O	2.06	2.08	0.0335	NA	1.951	NA2O	2.55		NA2O	2.43	2.45	0.0396	NA	2.306	NA2O		0.00
K2O	0.38	0.25	0.0027	K	0.215	K2O	1.17		K2O	0.45	0.30	0.0032	K	0.282	K2O		0.00
H2O+	0.00	0.00	0.0000	H	0.000	H2O+	0.00		H2O+	0.00	0.00	0.0000	H	0.000	H2O+		0.00
H2O-	0.00	0.00	0.0000	OH	0.000	H2O-	0.00		H2O-	0.00	0.00	0.0000	OH	0.000	H2O-		0.00
P2O5	0.07	0.03	0.0002	P	0.026	P2O5	0.00		P2O5	0.07	0.03	0.0002	P	0.026	P2O5		0.00
CO2	0.00	0.00	0.0000	C	0.000	CO2	0.00		CO2	0.00	0.00	0.0000	C	0.000	CO2		0.00
ZRO2	0.00	0.00	0.0000	ZR	0.000	ZRO2	0.00		ZRO2	0.00	0.00	0.0000	ZR	0.000	ZRO2		0.00
CR2O3	0.00	0.00	0.0000	CR	0.000	CR2O3	0.00		CR2O3	0.00	0.00	0.0000	CR	0.000	CR2O3		0.00
V2O3	0.00	0.00	0.0000	V	0.000	V2O3	0.00		V2O3	0.00	0.00	0.0000	V	0.000	V2O3		0.00
NIO	0.00	0.00	0.0000	NI	0.000	NIO	0.00		NIO	0.00	0.00	0.0000	NI	0.000	NIO		0.00
COO	0.00	0.00	0.0000	CO	0.000	COO	0.00		COO	0.00	0.00	0.0000	CO	0.000	COO		0.00
BAO	0.00	0.00	0.0000	BA	0.000	BAO	0.00		BAO	0.00	0.00	0.0000	BA	0.000	BAO		0.00
SRO	0.00	0.00	0.0000	SR	0.000	SRO	0.00		SRO	0.00	0.00	0.0000	SR	0.000	SRO		0.00
F				F		F			F				F		F		
CL	0.00	0.00	0.0000	CL	0.000	CL	0.00		CL	0.00	0.00	0.0000	CL	0.000	CL		0.00
S	0.00	0.00	0.0000	S	0.000	SO3	0.00		SO3	0.00	0.00	0.0000	S	0.000	SO3		0.00
PF				PF													
BO	0.00	0.00	0.0000	BO	0.000												
LI2O	0.00	0.00	0.0000	LI	0.000	LI2O	0.00		LI2O	0.00	0.00	0.0000	LI	0.000	LI2O		0.00
RB2O	0.00	0.00	0.0000	RB	0.000	RB2O	0.00		RB2O	0.00	0.00	0.0000	RB	0.000	RB2O		0.00
TOTAL	99.97			O	150.000	H2O	0.17	TOTAL	99.70				O	150.000	H2O		
	0.00					CL	0.00	LESS O	0.00						CL		
TOTAL	99.97					SO3	0.00	TOTAL	99.70						SO3		
						CO2	0.00								CO2		
RATIOS		WT.PC	MOL.PC			MAGN	0.00	RATIOS		WT.PC	MOL.PC				MAGN		
OR+LC+KP		9.72	9.48			SPHN	0.00								SPHN		
AB+NL		41.11	46.54			H2O+	0.00	OR+LC+KP		9.79	9.55				H2O+		
AN		49.17	43.98			H2O-	0.00	AB+NL		33.73	40.23				H2O-		
						OTHER	0.00	AN		51.43	50.24				OTHER		
		43.32	46.67			S.O.F.	0.00								S.O.F.		
		56.31	53.26			TOTAL	99.97	QTZ		43.23	41.07				TOTAL		99.97
		1.37	0.07			FE2/FE2+FE3	0.85	NS		43.23	25.93				FE2/FE2+FE3		0.85
								KP		11.43	8.41						
OR+AB+AN		77.62	80.75			OR+AB+AN	52.23	CAO+BAO+SRO		75.41	81.54				OR+AB+AN		51.42
NE+LC+KP		10.72	15.74			NE+LC+KP	0.00	NA2O		15.83	14.21				NC+LC+KP		0.00
AC+DI+HY+		9.59	3.51			AC+DI+HY+	30.15	K2O+RB2O		3.73	3.53				AC+DI+HY+		37.58
OL+CS						OL+CS	10.31								OL+CS		8.73
MT+CHM+HM		47.23	51.06			MT+CHM+HM	7.75	MGO		37.63	51.77				MT+CHM+HM		7.75
ALK+RB2O		12.14	16.33			IL+SPHN+	0.91	ALK+RB2O		14.55	11.82				IL+SPHN+		0.91
FE AS FEO		47.63	35.61					FE AS FEO		47.73	35.65						
DIFF.IND.		2.37													DIFF.IND.		2.37
FE2/FE2+FE3	72.43	72.43				SI UNSAT.	4.10	FE2/FE2+FE3		72.34	72.35				SI UNSAT.		3.16

* INCLUDES NS+KS+PO AND SPHN ** INCLUDES PF AND RU * INCLUDES NS+KS+PO AND SPHN ** INCLUDES PF AND RU

AMPH3

AMPH5

	WT.PC	MOL.PC	MOL.PR		ATOMS		CTPX	NORM		WT.PC	MOL.PC	MOL.PR		ATOMS		CTPX	NORM
SIO2	49.54	51.71	0.8250	SI	47.737	QTZ	0.00		SIO2	48.92	52.03	0.8140	SI	47.642	QTZ		0.00
TIO2	0.53	0.41	0.0051	TI	0.355	C	0.00		TIO2	0.61	0.49	0.0076	TI	0.447	C		0.00
AL2O3	15.35	9.35	0.1476	AL	17.041	CO	0.00		AL2O3	15.47	9.71	0.1517	AL	17.759	CO		0.00
FE2O3	3.35	1.51	0.0213	FE3	2.027	FE2O3	3.43		FE2O3	3.50	1.40	0.0219	FE3	2.565	FE2O3		6.72
FEO	7.77	6.79	0.1335	FE2	5.171	FEO	1.53		FEO	7.83	7.26	0.1134	FE2	7.269	FEO		0.00
MNO	0.21	0.18	0.0025	MN	0.171	MNO	29.60		MNO	0.35	0.32	0.0049	MN	0.289	MNO		61.32
MGO	9.35	14.55	0.3621	MG	13.632	MGO	0.00		MGO	8.79	13.75	0.2150	MG	12.569	MGO		27.31
CAO	11.71	13.31	0.2124	CA	12.208	CAO	0.00		CAO	10.11	11.93	0.1865	CA	10.561	CAO		0.00
NA2O	2.24	2.26	0.0351	NA	1.951	NA2O	0.00		NA2O	2.55	2.63	0.0411	NA	4.815	NA2O		0.00
K2O	0.38	0.26	0.0028	K	0.215	K2O	0.00		K2O	1.17	0.79	0.0123	K	1.382	K2O		0.00
H2O+	0.00	0.00	0.0000	H	0.000	H2O+	0.00		H2O+	0.00	0.00	0.0000	H	0.000	H2O+		0.00
H2O-	0.00	0.00	0.0000	OH	0.000	H2O-	0.00		H2O-	0.00	0.00	0.0000	OH	0.000	H2O-		0.00
P2O5	0.09	0.04	0.0003	P	0.026	P2O5	0.00		P2O5	0.07	0.03	0.0003	P	0.053	P2O5		0.00
CO2	0.00	0.00	0.0000	C	0.000	CO2	0.00		CO2	0.00	0.00	0.0000	C	0.000	CO2		0.00
ZRO2	0.00	0.00	0.0000	ZR	0.000	ZRO2	0.00		ZRO2	0.00	0.00	0.0000	ZR	0.000	ZRO2		0.00
CR2O3	0.00	0.00	0.0000	CR	0.000	CR2O3	0.00		CR2O3	0.00	0.00	0.0000	CR	0.000	CR2O3		0.00
V2O3	0.00	0.00	0.0000	V	0.000	V2O3	0.00		V2O3	0.00	0.00	0.0000	V	0.000	V2O3		0.00
NIO	0.00	0.00	0.0000	NI	0.000	NIO	0.00		NIO	0.00	0.00	0.0000	NI	0.000	NIO		0.00
COO	0.00	0.00	0.0000	CO	0.000	COO	0.00		COO	0.00	0.00	0.0000	CO	0.000	COO		0.00
BAO	0.00	0.00	0.0000	BA	0.000	BAO	0.00		BAO	0.00	0.00	0.0000	BA	0.000	BAO		0.00
SRO	0.00	0.00	0.0000	SR	0.000	SRO	0.00		SRO	0.00	0.00	0.0000	SR	0.000	SRO		0.00
F				F	0.000	F	0.00		F				F	0.000	F		
CL	0.00	0.00	0.0000	CL	0.000	CL	0.00		CL	0.00	0.00	0.0000	CL	0.000	CL		0.00
S	0.00	0.00	0.0000	S	0.000	SO3	0.00		SO3	0.00	0.00	0.0000	S	0.000	SO3		0.00
PF				PF	0.000												
BO	0.00	0.00	0.0000	BO	0.000												
LI2O	0.00	0.00	0.0000	LI	0.000	LI2O	0.00		LI2O	0.00	0.00	0.0000	LI	0.000	LI2O		0.00
RB2O	0.00	0.00	0.0000	RB	0.000	RB2O	0.00		RB2O	0.00	0.00	0.0000	RB	0.000	RB2O		0.00
TOTAL	100.41			O	150.000	H2O	0.21	TOTAL	92.47				O	150.000	H2O		
	0.00					CL	0.00	LESS O	0.00						CL		
TOTAL	100.41					SO3	0.00	TOTAL	92.47						SO3		
						CO2	0.00								CO2		
RATIOS		WT.PC	MOL.PC			MAGN	0.00	RATIOS		WT.PC	MOL.PC				MAGN		
OR+LC+KP		9.63	6.42			SPHN	0.00								SPHN		
AB+NL		33.67	36.03			H2O+	0.00	OR+LC+KP		12.57	12.17				H2O+		
AN		56.72	55.45			H2O-	0.00	AB+NL		33.00	43.07				H2O-		
						OTHER	0.00	AN		43.95	47.67				OTHER		
QTZ		43.42	46.67			S.O.F.	0.00								S.O.F.		
C		43.47	28.44			TOTAL	100.41	QTZ		41.26	6.47				TOTAL		92.47
CO		12.74	4.86			FE2/FE2+FE3	0.84	NS		41.26	29.81				FE2/FE2+FE3		0.84
								KP		13.77	7.73						
OR+AB+AN		73.39	83.73			OR+AB+AN	51.68	CAO+BAO+SRO		73.17	77.17				OR+AB+AN		55.42
NE+LC+KP		10.21	14.17			NE+LC+KP	0.00	NA2O		15.83	17.09				NC+LC+KP		0.00
AC+DI+HY+		5.74	2.63			AC+DI+HY+	35.39	K2O+RB2O		3.73	3.51				AC+DI+HY+		23.16
OL+CS						OL+CS	6.63								OL+CS		13.43
MT+CHM+HM		45.71	54.67			MT+CHM+HM	4.66	MGO		37.63	51.67				MT+CHM+HM		5.97
ALK+RB2O		12.29	9.03			IL+SPHN+	0.93	ALK+RB2O		13.24	12.43				IL+SPHN+		1.11
FE AS FEO		47.93	36.43					FE AS FEO		47.73	35.95						
DIFF.IND.		24.11													DIFF.IND.		22.64
FE2/FE2+FE3	72.13	72.13				SI UNSAT.	5.54	FE2/FE2+FE3		72.43	72.43				SI UNSAT.		5.00

* INCLUDES NS+KS+PO AND SPHN ** INCLUDES PF AND RU * INCLUDES NS+KS+PO AND SPHN ** INCLUDES PF AND RU

AMPH6

	WT.PC	MOL.PC	MOL.PR		ATOMS		CIPW NORM	
SIO2	49.45	51.32	0.8554	SI	47.132	QTZ	0.00	
TIO2	0.53	0.42	0.0053	TI	0.415	C	0.00	
AL2O3	14.47	8.84	0.1419	AL	16.149	ZR	0.00	
FE2O3	3.75	1.82	0.0234	FE3	2.022	OR	7.27	
FEO	8.93	7.74	0.1077	FE2	8.567	AB	22.45	
MNO	0.15	0.13	0.0021	MN	0.124	AN	24.40	
MGO	9.51	14.71	0.2361	MG	14.515	LC	0.00	
CAO	11.76	11.70	0.2088	CA	11.553	NE	0.26	
NA2O	2.44	2.74	0.0441	NA	5.422	KP	0.00	
K2O	1.23	0.85	0.0091	K	1.682	HL	0.00	
H2O+	0.00	0.00	0.0000	OH	0.000	TH	0.00	
H2O-	0.00	0.00	0.0000		0.000	NC	0.00	
P2O5	0.07	0.03	0.0005	P	0.059	AC	0.00	
CO2	0.00	0.00	0.0000	C	0.000	NS	0.00	
OTHER	0.00	0.00	0.0000		0.000	KS	0.00	
ZRO2	0.00	0.00	0.0000	ZR	0.000	DI	29.66	
CR2O3	0.00	0.00	0.0000	CR	0.000	WO	0.00	
V2O3	0.00	0.00	0.0000	V	0.000	HY	0.00	
NIO	0.00	0.00	0.0000	NI	0.000	OL	16.22	
COO	0.00	0.00	0.0000	CO	0.000	CS	0.00	
BAO	0.00	0.00	0.0000	BA	0.000	MT	5.07	
SRO	0.00	0.00	0.0000	SR	0.000	CM	0.00	
F	0.00	0.00	0.0000	F	0.000	HM	0.00	
CL	0.00	0.00	0.0000	CL	0.000	IL	1.23	
SO3	0.00	0.00	0.0000	S	0.000	SPH	0.00	
S	0.00	0.00	0.0000	S	0.000	PF	0.00	
LI2O	0.00	0.00	0.0000	LI	0.000	RU	0.25	
RB2O	0.00	0.00	0.0000	RB	0.000	AP	0.00	
TOTAL	97.68			O	160.000	HAP	0.17	
LESS O	0.00					FR	0.00	
TOTAL	97.68					PY	0.00	
						LC	0.00	
RATIOS		WT.PC	MOL.PC			MAGN	0.00	
						CHALY	0.00	
OR+LC+KP		7.27	5.36			SPEC	0.00	
AB+NE		41.73	43.19			H2O+	-0.00	
AN		44.57	43.51			H2O-	0.00	
						OTHERS	0.00	
QTZ		44.73	0.00			S.CORR.	0.00	
NE		41.43	29.96			TOTAL	97.68	
AP		13.75	7.75			FE/FE+MG	0.29	
CAO+BAO+SRO		72.03	73.03			OR+AB+AN	54.12	
NA2O		19.43	13.41			NE+LC+KP	0.26	
K2O+RB2O		5.74	3.51			AC+DI+HY+	29.66	
MGO		35.31	44.33			OL+CS	16.22	
ALA+RB2O		15.52	13.32			MT+CM+HM	5.07	
FE AS FEO		47.99	37.31			IL+SPH**	1.23	
FE2/FE2+FE3		72.47	72.41			DIFF.IND.	89.88	
						SI UNSAT.	6.35	

* INCLUDES NS+KS+MC AND SPOD ** INCLUDES PF AND RU

AMPH7

	WT.PC	MOL.PC	MOL.PR		ATOMS		CIPW NORM	
SIO2	47.99	51.93	0.7971	SI	47.676	QTZ	0.00	
TIO2	0.63	0.51	0.0071	TI	0.487	C	0.00	
AL2O3	14.73	9.41	0.1445	AL	17.283	ZR	0.00	
FE2O3	3.50	1.43	0.0219	FE3	2.022	OR	7.27	
FEO	7.93	7.19	0.1104	FE2	8.572	AB	22.45	
MNO	0.36	0.33	0.0051	MN	0.384	AN	24.40	
MGO	9.47	13.59	0.2101	MG	13.365	LC	0.00	
CAO	11.13	11.77	0.1806	CA	10.805	NE	0.26	
NA2O	2.71	2.85	0.0437	NA	5.229	KP	0.00	
K2O	1.23	0.85	0.0131	K	1.562	HL	0.00	
H2O+	0.00	0.00	0.0000	OH	0.000	TH	0.00	
H2O-	0.00	0.00	0.0000		0.000	NC	0.00	
P2O5	0.07	0.03	0.0010	P	0.059	AC	0.00	
CO2	0.00	0.00	0.0000	C	0.000	NS	0.00	
OTHER	0.00	0.00	0.0000		0.000	KS	0.00	
ZRO2	0.00	0.00	0.0000	ZR	0.000	DI	29.66	
CR2O3	0.00	0.00	0.0000	CR	0.000	WO	0.00	
V2O3	0.00	0.00	0.0000	V	0.000	HY	0.00	
NIO	0.00	0.00	0.0000	NI	0.000	OL	16.22	
COO	0.00	0.00	0.0000	CO	0.000	CS	0.00	
BAO	0.00	0.00	0.0000	BA	0.000	MT	5.07	
SRO	0.00	0.00	0.0000	SR	0.000	CM	0.00	
F	0.00	0.00	0.0000	F	0.000	HM	0.00	
CL	0.00	0.00	0.0000	CL	0.000	IL	1.23	
SO3	0.00	0.00	0.0000	S	0.000	SPH	0.00	
S	0.00	0.00	0.0000	S	0.000	PF	0.00	
LI2O	0.00	0.00	0.0000	LI	0.000	RU	0.25	
RB2O	0.00	0.00	0.0000	RB	0.000	AP	0.00	
TOTAL	97.65			O	160.000	HAP	0.17	
LESS O	0.00					FR	0.00	
TOTAL	97.65					PY	0.00	
						LC	0.00	
RATIOS		WT.PC	MOL.PC			MAGN	0.00	
						CHALY	0.00	
OR+LC+KP		13.37	12.93			SPEC	0.00	
AB+NE		41.73	43.45			H2O+	-0.00	
AN		44.57	43.51			H2O-	0.00	
						OTHERS	0.00	
QTZ		44.73	0.00			S.CORR.	0.00	
NE		41.43	29.96			TOTAL	97.68	
AP		13.75	7.75			FE/FE+MG	0.29	
CAO+BAO+SRO		72.03	73.03			OR+AB+AN	54.12	
NA2O		19.43	13.41			NE+LC+KP	0.26	
K2O+RB2O		5.74	3.51			AC+DI+HY+	29.66	
MGO		35.31	44.33			OL+CS	16.22	
ALA+RB2O		15.52	13.32			MT+CM+HM	5.07	
FE AS FEO		47.99	37.31			IL+SPH**	1.23	
FE2/FE2+FE3		72.47	72.41			DIFF.IND.	89.88	
						SI UNSAT.	6.35	

* INCLUDES NS+KS+MC AND SPOD ** INCLUDES PF AND RU

Appendix 4

ELECTRON MICROPROBE DATA

This appendix presents data collected by electron microprobe, which have been used in the interpretation of the alkaline rocks of Port Cygnet.

Sample=? CY2AMPH OXNO.=? -23
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 472109

ELEM	OX	STRUCT
Na2O	2.1	.601
MgO	7.51	1.65
Al2O3	14.02	2.435
SiO2	37.61	5.542
K2O	2	.376
CaO	11.84	1.869
TiO2	2.29	.253
MnO	.36	.045
FeO	22.28	2.47
TOTAL	95.27	15.241

MG/MG+FE= 40.05
CA: MG: FE = 31.21 27.55 41.24
Trace Elements? 9

Sample=? CY2AMPH2 CENT.
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 472481 OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.1	.599
MgO	8.57	1.877
Al2O3	13.74	2.378
SiO2	38.16	5.604
K2O	2.23	.417
CaO	11.56	1.818
TiO2	2.24	.247
MnO	.48	.059
FeO	20.9	2.31
TOTAL	95.95	15.309

MG/MG+FE= 44.83
CA: MG: FE = 30.27 31.26 38.47
Trace Elements? 9

Sample=? CY2AMPH2EDGE OXNO.=? -23
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 477756

ELEM	OX	STRUCT
Na2O	1.95	.555
MgO	8.94	1.95
Al2O3	13.38	2.308
SiO2	38.7	5.664
K2O	2.1	.391
CaO	11.5	1.804
TiO2	2.29	.252
MnO	.35	.043
FeO	20.79	2.29
TOTAL	96.61	15.257

MG/MG+FE= 45.99
CA: MG: FE = 29.85 32.26 37.89
Trace Elements? 9

Sample=? CY2AMPH3 OXNO.=? -23
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 512433

ELEM	OX	STRUCT
MgO	10.88	2.33
Al2O3	6.03	1.021
SiO2	46.12	6.626
CaO	22.49	3.461
TiO2	1.42	.153
FeO	13.07	1.413
TOTAL	97.64	15.004

MG/MG+FE= 62.25
CA: MG: FE = 48.04 32.34 19.61
Trace Elements? 9

Sample=? CY2AMPH EDGE ABOVE
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 477206 OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.91	.537
MgO	11.42	2.465
Al2O3	13.26	2.263
SiO2	39.51	5.72
K2O	1.89	.349
CaO	11.87	1.84
TiO2	2.35	.256
FeO	17.79	1.938
TOTAL	96.6	15.368

MG/MG+FE= 55.98
CA: MG: FE = 29.47 39.48 31.04
Trace Elements? 9

Sample=? CY2GR4 CENTRE OXNO.=? -6
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 517490

ELEM	OX	STRUCT
Na2O	.5	.036
MgO	10.86	.606
Al2O3	1.98	.088
SiO2	50.27	1.881
CaO	22.49	.902
MnO	.63	.02
FeO	13.24	.373
TOTAL	98.61	3.906

CA: MG: FE = 47.95 32.22 19.83
Trace Elements? 9

Sample=? CY2GR2CPX EDGE OXNO.=? -6
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 508441

ELEM	OX	STRUCT
Na2O	.8	.058
MgO	9.25	.52
Al2O3	6.5	.289
SiO2	45.78	1.726
CaO	21.95	.887
TiO2	1.03	.029
MnO	.34	.011
FeO	14.31	.406
TOTAL	98.53	3.926

CA: MG: FE = 48.92 28.68 22.39
Trace Elements? 9

Sample=? CY2REPEAT ABOVE
As before? 00\? 0% T1= 9 Time= 80
Tot Int= 527353 OXNO.=? -6

ELEM	OX	STRUCT
MgO	10.79	.602
Al2O3	6.05	.267
SiO2	46.38	1.736
CaO	22.56	.905
TiO2	1.33	.038
FeO	12.88	.363
TOTAL	100.78	3.911

MG/MG+FE= 62.38
CA: MG: FE = 48.4 32.19 19.41
Trace Elements? 9

Sample=? CY2GR5 EDGE OXNO.=? -6
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 536147

ELEM	OX	STRUCT
Na2O	.88	.063
MgO	11.49	.638
Al2O3	.59	.026
SiO2	51.9	1.934
CaO	22.05	.881
MnO	.84	.026
FeO	12.25	.344
TOTAL	102.84	3.912

CA: MG: FE = 47.29 34.25 18.46
Trace Elements? 9

Sample=? CY2GR5CNCENTRE OXNO.=? -6
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 542723

ELEM	OX	STRUCT
MgO	18.39	.992
SiO2	54.78	1.983
CaO	26.08	1.012
FeO	.74	.02
TOTAL	100.46	4.007

CA: MG: FE = 50 49.01 .99
Trace Elements? 9

Sample=? CY2GR4 EDGE OXNO.=? -6
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 520983

ELEM	OX	STRUCT
Na2O	.62	.045
MgO	10.99	.614
Al2O3	1.98	.088
SiO2	50.04	1.874
CaO	22.25	.893
MnO	.66	.021
FeO	13.44	.379
TOTAL	100.26	3.914

CA: MG: FE = 47.35 32.56 20.1
Trace Elements? 9

```
 Sample=? CY2GR8EDGE          OXNO.=? -6
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 516583
 ELEM     OX     STRUCT
 MgO     11.54   .641
 Al2O3    .36    .016
 SiO2    51.98  1.937
 CaO     23.21   .927
 MnO      .71    .022
 FeO     12.21   .342
  TOTAL 96.31  3.885
 CA: MG: FE = 48.53  33.56  17.91
 Trace Elements? 9


 Sample=? GR8CN CENTRE          OXNO.=? -6
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 539997
 ELEM     OX     STRUCT
 MgO     18.29   .985
 SiO2    55.21  1.994
 CaO     25.87  1.001
 FeO      .63    .017
 TOTAL 99.21  3.997
  CA: MG: FE = 49.98  49.18  .85
 Trace Elements? 9


 Sample=? CY2GR7          OXNO.=? -6
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 519537
 ELEM     OX     STRUCT
 Na2O     .88    .063
 MgO     12.24   .677
 Al2O3   1.08    .047
 SiO2    52.09  1.932
 CaO     21.62   .859
 MnO      .76    .024
 FeO     11.34   .316
  TOTAL 99.83  3.918
 CA: MG: FE = 46.38  36.56  17.06
 Trace Elements? 9


 Sample=? DEL-113          OXNO.=? -6
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 528239
 ELEM     OX     STRUCT
 Na2O     .67    .048
 MgO     15.89   .862
 Al2O3    5.16   .221
 SiO2    51.88  1.888
 CaO     21.09   .822
 TiO2     .53    .015
 Cr2O3    .75    .021
 FeO     4.03    .123
 TOTAL 101.56  4
  MG/MG+FE=      87.51
 CA: MG: FE = 45.49  47.7  6.81
  CA: NA: K = 94.48  5.52  0
 Trace Elements? 9


  Sample=? CY2 DIOP. CENTRE
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 543036          OXNO.=? -6
 ELEM     OX     STRUCT
 Na2O     .49    .035
 MgO     13.51   .752
 Al2O3    .51    .022
 SiO2    53.48  1.996
 CaO     23.55   .942
 FeO      7.77   .243
 MnO      .7     .022
 TOTAL 102.45  4.012
  MG/MG+FE=      75.58
 CA: MG: FE = 48.63  38.82  12.55
  CA: NA: K = 96.42  3.58  0
 Trace Elements? 9


 Sample=? CY2 DIOP ABOVE EDGE
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 549618          OXNO.=? -6
 ELEM     OX     STRUCT
 Na2O    1.37    .101
 MgO     11.01   .622
 Al2O3   1.45    .065
 SiO2    52.22  1.98
 CaO     21.63   .879
 FeO     11.46   .364
 MnO      .84    .027
  TOTAL 103.33  4.038
 MG/MG+FE=      63.08
  CA: MG: FE = 47.13  33.35  19.52
 CA: NA: K = 89.69  10.31  0
 Trace Elements? 9


 Sample=? CY2 DIOPSIDE EDGE INC CENTRE
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 532817          OXNO.=? -6
 ELEM     OX     STRUCT
 Na2O     .8     .059
 MgO     8.77    .504
 Al2O3   7.18    .326
 SiO2    46.1   1.775
 CaO     22.4    .924
 TiO2    1.07    .031
 FeO     13.3    .428
 MnO      .36    .012
 TOTAL 99.51  4.059
  MG/MG+FE=      54.08
 CA: MG: FE = 49.78  27.16  23.06
  CA: NA: K = 94  6  0
 Trace Elements? 9


  Sample=? CY2 BIAXIAL INCLUSION AGAIN
 As before? 0          OXNO.=? -25
  T1= 9 Time= 80  EDAX free
 Tot Int= 517043
 ELEM     OX     STRUCT
 Al2O3   24.66   4.36
 SiO2    46.02  6.903
 CaO     28.31   4.55
 FeO       .84    .105
 Total 91.27  15.9175
  Mg/Mg+Fe=      0
 Ca: Mg: Fe = 97.74  0  2.26
  Ca: Na: K = 100  0  0
 AFM Ratio = 95.4
 Trace Elements? 9


 Sample=? CY2DIOP.  INC. ED  CENTRE
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 535072          OXNO.=? -6
 ELEM     OX     STRUCT
 Na2O     .71    .052
 MgO     12.17   .683
 Al2O3   1.78    .079
 SiO2    52.13  1.963
 CaO     22.64   .914
 FeO     10.12   .319
 MnO      .45    .014
 TOTAL 99.31  4.024
  MG/MG+FE=      68.16
 CA: MG: FE = 47.7  35.65  16.65
  CA: NA: K = 94.62  5.38  0
 Trace Elements? 9


 Sample=? CY2DIOP EDGE ABOVE
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 530064          OXNO.=? -6
 ELEM     OX     STRUCT
 Na2O     .59    .044
 MgO     9.98    .57
 Al2O3   6.39    .288
 SiO2    46.7   1.788
 CaO     22.7    .931
 TiO2    1.2     .035
 FeO     12.09   .387
 MnO      .34    .011
  TOTAL 99.42  4.054
 MG/MG+FE=      59.56
  CA: MG: FE = 49.31  30.19  20.5
 CA: NA: K = 95.49  4.51  0
 Trace Elements? 9
```

```
 Sample=? CY2 DIOP CETRE INC
 As before? \? 0%                    T1= 9 Time= 80
 Tot Int= 535662
 ELEM     OX      STRUCT                    OXNO.=? -6
 Na2O     .58     .042                      EDAX free
 MgO      12.02   .676
 Al2O3    .66     .029
 SiO2     52.77   1.992
 CaO      22.81   .922
 FeO      10.43   .329
 MnO      .75     .024
  TOTAL   98.83   4.014
 MG/MG+FE=  67.26
  CA: MG: FE = 47.85  35.08  17.07
 CA:-NA:-K = 95.64 4.36 0
 Trace Elements? 9
 ---------


 Sample=? CY2ABOVE EDGE
  As before? 0%  T1= 9 Time= 80  EDAX free
  Tot Int= 538653
  ELEM     OX      STRUCT                   OXNO.=? -6
  Na2O     1.11    .081
  MgO      11.11   .628
  Al2O3    1.04    .046
  SiO2     52.37   1.987
  CaO      21.91   .891
  FeO      11.6    .368
  MnO      .88     .028
   TOTAL   100.49  4.029
 MG/MG+FE=  63.05
  CA: MG: FE = 47.22  33.28  19.5
 CA: NA: K = 91.67 8.33 0
  Trace Elements? 9


 Sample=? CY2HORNBLENDE IN ROCK GM
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 482068                            OXNO.=? -23
 ELEM     OX      STRUCT
 Na2O     1.89    .552
 MgO      9.39    2.109
 Al2O3    13.74   2.441
 SiO2     39.06   5.89
 K2O      2.14    .412
 CaO      12.23   1.976
 TiO2     2.72    .308
 FeO      18.46   2.328
 MnO      .39     .049
  TOTAL   93.25   16.065
 MG/MG+FE=  47.53
  CA: MG: FE = 30.81  32.89  36.3
 CA: NA: K = 67.21 18.78 14.01
 Trace Elements? 9


 Sample=? CY2HORNBLENDE 2
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 532761                            OXNO.=? -23
 ELEM     OX      STRUCT
 MgO      9.05    1.991
 Al2O3    6.71    1.166
 SiO2     46.36   6.838
 CaO      23.07   3.647
 TiO2     1.1     .122
 FeO      13.34   1.646
 MnO      .36     .045
  TOTAL   98.04   15.455
 MG/MG+FE=  54.74
  CA: MG: FE = 50.07  27.33  22.6
 CA: NA: K = 100 0 0
 Trace Elements? 9


 Sample=? CY2CPX          OXNO.=? -6
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 534760
 ELEM     OX      STRUCT
 Na2O     1.79    .131
 MgO      8.89    .498
 Al2O3    2.36    .105
 SiO2     50.12   1.884
 CaO      20.2    .814
 MnO      .83     .026
 FeO      15.81   .447
  TOTAL   104.14  3.905
 CA: MG: FE = 46.28  28.31  25.41
 Trace Elements? 9


 Sample=? CY2GR2 CPXCENTRE          OXNO.=? -6
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 512028
 ELEM     OX      STRUCT
 Na2O     1.86    .136
 MgO      8.46    .476
 Al2O3    2.17    .097
 SiO2     49.86   1.881
 CaO      19.87   .803
 MnO      .93     .03
 FeO      16.87   .479
  TOTAL   99.72   3.902
 CA: MG: FE = 45.68  27.08  27.25
 Trace Elements? 9


 Sample=? CY2CPX CENTRE             OXNO.=? -6
 As before? 0% T1= 9 Time= 80  EDAX free
 Tot Int= 470772
 ELEM     OX      STRUCT
 Na2O     .61     .044
 MgO      9       .505
 Al2O3    6.03    .268
 SiO2     46.51   1.751
 CaO      21.9    .883
 TiO2     .82     .023
 MnO      .43     .014
 FeO      14.71   .417
  TOTAL   89.42   3.905
 CA: MG: FE = 48.92  27.98  23.1
 Trace Elements? 9


 Sample=? CY2EDGECPXINC             OXNO.=? -6
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 502815
 ELEM     OX      STRUCT
 Na2O     .75     .055
 MgO      9.07    .51
 Al2O3    6.41    .285
 SiO2     45.95   1.732
 CaO      22.09   .892
 TiO2     1.02    .029
 MnO      .32     .01
 FeO      14.4    .408
 TOTAL    96.84   3.921
  CA: MG: FE = 49.28  28.18  22.54
 Trace Elements? 9


 SAMPLE=? CY2          OXNO.=? -6
 AS BEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
 ELEM     OX      STRUCT
 NA2O     .82     .06
 MGO      10.7    .608
 AL2O3    1.93    .086
 SIO2     50.91   1.942
 CAO      22.58   .923
 CR2O3    .47     .014
 MNO      .52     .016
 FEO      12.07   .384
  TOTAL   99.9    4.037
  CA: MG: FE = 48.17  31.74  20.09
 TRACE ELEMENTS? 9


 SAMPLE=? CY2 DIOPSIDE              OXNO.=? -6
 AS BEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
 ELEM     OX      STRUCT
 NA2O     .94     .069
 MGO      11.18   .633
 AL2O3    1.85    .082
 SIO2     51.28   1.949
 CAO      22.21   .904
 CR2O3    .28     .008
 MNO      .41     .013
 FEO      11.84   .376
  TOTAL   102.9   4.038
  CA: MG: FE = 47.25  33.09  19.66
 TRACE ELEMENTS? 9
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 SAMPLE=? CY2 DIOPSIDE                    OXNO.=? -6
AS BEFORE? 0
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        505229
ELEM     OX     STRUCT
NA2O    .96     .07
MGO     10.38   .59
AL2O3   1.95    .087
SIO2    51.02   1.946
CAO     22.33   .913
CR2O3   .29     .008
MNO     .53     .017
FEO     12.56   .401
 TOTAL 101.6   4.039
 CA: MG: FE = 47.95   31.01   21.04
TRACE ELEMENTS? 9

 SAMPLE=? CY2 DIOPSIDE                    OXNO.=? -6
AS BEFORE? 0
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        497586
ELEM     OX     STRUCT
NA2O    1.54    .113
MGO     9.9     .563
AL2O3   1.74    .078
SIO2    51.62   1.971
CAO     21.16   .865
CR2O3   .32     .009
MNO     .63     .02
FEO     13.08   .417
 TOTAL 99.3   4.041
 CA: MG: FE = 46.87   30.51   22.62
TRACE ELEMENTS? 9

 SAMPLE=? CY2 AMPHIBOLE CENTRE
AS BEFORE? 0                      OXNO.=? -23
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        463793
ELEM     OX     STRUCT
NA2O    2.63    .774
MGO     7.89    1.787
AL2O3   12.45   2.229
SIO2    40.67   6.177
K2O     1.77    .343
CAO     11.28   1.835
TIO2    1.53    .175
MNO     .52     .066
FEO     21.25   2.7
 TOTAL 100.1   16.09
 CA: MG: FE = 29.03   28.27   42.7
TRACE ELEMENTS? 9

SAMPLE=? CY2 AMPHIBOLE EDGE
 AS BEFORE? 0                     OXNO.=? -23
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        465034
ELEM     OX     STRUCT
NA2O    2.14    .625
MGO     9.15    2.055
AL2O3   14.27   2.532
SIO2    38.91   5.861
K2O     2.07    .398
CAO     11.88   1.917
TIO2    2.7     .306
FEO     18.85   2.374
 TOTAL 97.7   16.071
 CA: MG: FE = 30.21   32.38   37.41
TRACE ELEMENTS? 9

 SAMPLE=? CY2 REPEAT ABOVE AS PYROXENE
AS BEFORE? 0                      OXNO.=? -6
 TI= 9 TIME= 80  EDAX FREE
 TOT INT=        494054
ELEM     OX     STRUCT
NA2O    .74     .054
MGO     10.43   .591
AL2O3   5.71    .255
SIO2    47.85   1.821
CAO     22.61   .922
TIO2    .98     .028
CR2O3   .35     .01
FEO     11.32   .36
 TOTAL 99.4   4.045
 CA: MG: FE = 49.2   31.57   19.23
TRACE ELEMENTS? 9

 SAMPLE=? CY2 AMPHIBOLE EDGE
 AS BEFORE? 0                     OXNO.=? -23
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        462708
ELEM     OX     STRUCT
NA2O    2.12    .616
MGO     9.1     2.038
AL2O3   14.4    2.549
SIO2    39.3    5.902
K2O     2.02    .387
CAO     11.99   1.929
TIO2    2.55    .288
FEO     18.53   2.327
 TOTAL 98.1   16.04
 CA: MG: FE = 30.66   32.38   36.97
TRACE ELEMENTS? 9

 SAMPLE=? CY2 AMPHIBOLE?                  OXNO.=? -23
AS BEFORE? 0
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        496930
ELEM     OX     STRUCT
NA2O    .8      .225
MGO     10.5    2.285
AL2O3   5.8     .998
SIO2    47.49   6.937
CAO     22.72   3.556
TIO2    1.02    .111
CR2O3   .35     .04
FEO     11.31   1.381
 TOTAL 99   15.539
 CA: MG: FE = 49.24   31.64   19.12
TRACE ELEMENTS? 9
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Sample=?-CY3 LARGE AMPHIBOLE
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 484392
ELEM    OX     STRUCT          OXNO.=? -23
Na2O   2.59    .76
MgO    8.09   1.828
Al2O3  13.53  2.416
SiO2   39.64  6.006
K2O    1.82   .352
CaO    11.75  1.908
TiO2   2.09   .238
FeO    20.48  2.595
TOTAL  97.47  16.103
 MG/MG+FE=     41.33
CA: MG: FE = 30.14  28.87  40.99
 CA: NA: K = 63.18  25.17  11.66
Trace Elements? 9

$ ? 1


 Sample=? CY3 AMPHIBOLE NEAR ABOVE
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 489518
ELEM   OX    STRUCT          -1 OXNO.=? -23
Na2O   2.02   .591
MgO    8.54  1.918
Al2O3  14.13  2.51
SiO2   39.4   5.936
K2O    2.12   .407
CaO    12.1  1.954
TiO2   2.59   .293
FeO    19.08  2.404
 TOTAL 97.64  16.013
MG/MG+FE=     44.38
 CA: MG: FE = 31.13  30.56  38.3
CA: NA: K = 66.19  20.02  13.79
Trace Elements? 9


Sample=? CY3AMPH3          OXNO.=? -23
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 504286
ELEM    OX     STRUCT
MgO    11.19  2.393
Al2O3  4.46   .754
SiO2   47.83  6.859
CaO    22.6   3.472
TiO2   .9     .097
MnO    .4     .049
FeO    12.61  1.361
 TOTAL 95.88  14.985
MG/MG+FE=     63.75
 CA: MG: FE = 48.05  33.12  18.83
Trace Elements? 9


 SAMPLE=? CY3 AMPHIBOLE          OXNO.=? -23
$ BEFORE? 0


 T1= 9 TIME= 80  EDAX FREE
TOT INT=       516502
ELEM    OX     STRUCT
NA2O   2.02   .599
MGO    7.41   1.688
AL2O3  12.74  2.293
SIO2   39.96  6.106
K2O    2.41   .469
CAO    12.86  2.105
TIO2   1.27   .145
MNO    .68    .088
FEO    20.65  2.638
 TOTAL 99.5   16.136
 CA: MG: FE = 32.73  26.25  41.02
TRACE ELEMENTS? 9
```

```
 SAMPLE = ? CY6 FELDSPAR AROUND ABOVE
AS BEFORE? 0                              OXNO.=? -16
 TI= 9  TIME= 100
EDAX FREE
ELEM              OX%          STRUCT
NA20              2.1          .3717
AL203             19.14        2.0568
SI02              65.07        5.9325
K
 20               12.32        1.4333
CAO               .98          .0957
TI02              .37          .0252
 TOTAL            102.925   9.9152
TRACE ELEMENTS? 9

 SAMPLE = ? CY6 HB5 EDGE \? 2 OXNO.=? -23
AS BEFORE? 0
 TI= 9  TIME= 100
EDAX FREE
ELEM              OX%          STRUCT
NA20              2.02         .6065
MGO               6.18         1.4121
AL203             11.81        2.132
SI02              41.35        6.3334
K20               2.35         .459
CAO               11.25        1.8462
T
 I02              1.27         .146
CR203             .13          .0159
MNO               .79          .1022
FEO               22.84        2.925
 TOTAL            100.72   15.9723
 CA: MG: FE = 29.86   22.84   47.3
T
 RACE ELEMENTS? 9

 SAMPLE = ? CY6 HB6 EDGE \? 2 OXNO.=? -23
AS BEFORE? 0
 TI= 9  TIME= 100
EDAX FREE
ELEM              OX%          STRUCT
N
 A20              .73          .2083
MGO               10.05        2.2111
AL203             3.65         .6345
SI02              50.89        7.5122
K20               .93          .1747
C
 AO               11.92        1.8856
TI02              .33          .037
CR203             .16          .0188
MNO               .43          .0533
FEO               20.94        2.5856
 TOTAL            96.8265   15.3211
 CA: MG: FE = 28.22   33.09   38.69
TRACE ELEMENTS? 9

 SAMPLE = ? CY6  FELDS. IN HB5 \? OXNO.=? -16
AS BEFORE? 0
 TI= 9  TIME= 100
EDAX FREE
ELEM              OX%          STRUCT
NA20              8.26         1.395
A
 L203             20.88        2.1428
SI02              68.15        5.934
K20               .54          .0602
CAO               1.16         .1083
TI02              .1           .0066
CR203             .09          .006
FEO               .81          .059
 TOTAL            101.349   9.71189
TRACE ELEMENTS? 9

 SAMPLE=? CY6 FELDSPAR CENTRE \? OXNO.=? -16
AS BEFORE? 0
 TI= 9 TIME= 80   EDAX FREE
TOT INT=          466647
ELEM      OX      STRUCT
NA20      7.97    1.361
AL203     22.71   2.36
SI02      64.37   5.674
K20       1       .112
CAO       3.96    .374
 TOTAL 97.9   9.884
 CA: NA: K = 20.24   73.68   6.09
TRACE ELEMENTS? 9

 SAMPLE=? CY6 EDGE OF ABOVE \? 3? -1
AS BEFORE? 0                              OXNO.=? -16
 TI= 9 TIME= 80   EDAX FREE
TOT INT=          465806
 ELEM      OX      STRUCT
 NA20      7.78    1.33
 AL203     22.96   2.387
 SI02      64.09   5.654
 K20       1.18    .132
 CAO       3.99    .376
  TOTAL 96.9   9.883
  CA: NA: K = 20.48   72.3   7.22
 TRACE ELEMENTS? N

 SAMPLE = ? CY6 HB4 \? 2 OXNO.=? -23
 TI= 9  TIME= 100
EDAX FREE
ELEM              OX%          STRUCT
NA20              1.6          .4683
MGO               6.18         1.3883
AL203             17.35        3.0786
SI02              38.51        5.7979
K20               2.34         .4489
CAO               11.59        1.8692
TI02              2.45         .2777
MNO               .23          .0296
F
 EO               19.77        2.49
 TOTAL            103.333   15.8485

 CA: MG: FE = 32.52   24.15   43.32
TRACE ELEMENTS? 9

 SAMPLE = ? CY6-HB\? 1 OXNO.=? -23
AS BEFORE? 0
EDAX FREE
ELEM              OX%          STRUCT
NA20              1.35         .3998
MGO               6.35         1.4483
AL203             12.98        2.3407
SI02              40.47        6.1916
K20               2.47         .482
CAO               11.38        1.8647
T
 I02              1.38         .1593
CR203             .16          .0194
MNO               .77          .1004
FEO               22.68        2.9013

 TOTAL            101.621   15.908
 MG/MG+FE=        33.29
TRACE ELEMENTS? 9

 SAMPLE = ? CY6-SPHENE-IN-HB3\? 0 OXNO.=? -5
AS BEFORE? 0
 TI= 9  TIME= 100
EDAX FREE
ELEM              OX%          STRUCT
AL203             .47          .0182
SI02              31.66        1.0363
CAO               28.85        1.0119
T
 I02              37.5         .9231
FEO               1.51         .0412
 TOTAL            99.1227   3.0307
TRACE ELEMENTS? 9

S ? 1
SAMPLE = ? CY6-HB3\? 2 OXNO.=? -23
 TI= 9  TIME= 100
EDAX FREE
ELEM              OX%          STRUCT
NA20              1.55         .455
MGO               7.81         1.7624
AL203             12.81        2.2858
SI02              40.26        6.0943
K20               2.18         .4211
CAO               11.98        1.9427
TI02              2.65         .3019
CR203             .12          .014
MNO               .59          .0762
FEO               20.04        2.5375

 TOTAL            97.2504   15.8909
 CA: MG: FE = 31.12   28.23   40.65
```

```
  $ ? 1    13-10-80
  Sample=? CY8 K-FELDSPAR IN 2ND TO ABOVE
 Tot Int= 527493
 ELEM     OX      STRUCT
 Na2O     1.7     .404
 Al2O3    18.39   1.992
 SiO2     64.74   5.243
 K2O      14.21   1.67
 CaO      1       .079
 Total 101.99     10.0977
  Ca: Mg: Fe = 100   0   0
  Ca: Na: K = 4.78   14.66   80.56
  AFM Ratio = 100
 Trace Elements? 9
```

```
  $ ? 1    13-10-80
  Sample=? CY8 ANOTHER SPOT EDGE PLAG.
 Tot Int= 503792
 ELEM     OX      STRUCT
 Na2O     7.14    1.223
 Al2O3    24.11   2.511
 SiO2     62.86   5.554
 K2O      .58     .065
 CaO      5.07    .48
  Total 96.83     9.8341
  Ca: Mg: Fe = 100   0   0
  Ca: Na: K = 27.15   69.17   3.68
  AFM Ratio = 100
 Trace Elements? 9
```

```
  $ ? 1    13-10-80
  Sample=? CY8 K-FELDSPAR NEXT TO ABOVE
 Tot Int= 556733
 ELEM     OX      STRUCT
 Na2O     .85     .153
 Al2O3    18.2    1.99
 SiO2     64.01   5.939
 K2O      15.53   1.838
 CaO      1.41    .14
  Total 99.64     10.0611
  Ca: Mg: Fe = 100   0   0
  Ca: Na: K = 6.57   7.18   86.25
  AFM Ratio = 100
 Trace Elements? 9
```

```
  $ ? 1    13-10-80
  Sample=? CY8 ANOTHER SPOT
 Tot Int= 503450
 ELEM     OX      STRUCT
 Na2O     7.31    1.252
 MgO      .2      .026
 Al2O3    23.16   2.409
 SiO2     63.71   5.624
 K2O      .71     .08
 CaO      4.71    .446
  Total 99.53     9.8575
  Mg/Mg+Fe=       100
  Ca: Mg: Fe = 94.49   5.51   0
  Ca: Na: K = 25.08   70.42   4.5
  AFM Ratio = 97.89
 Trace Elements? 9
```

```
  $ ? 1    13-10-80
  Sample=? CY8 K-FELDSPAR AGAINST ABOVE
 Tot Int= 560007
 ELEM     OX      STRUCT
 Na2O     1.84    .328
 Al2O3    19.03   2.063
 SiO2     63.89   5.877
 K2O      13.36   1.568
 CaO      1.3     .128
 TiO2     .54     .038
  Total 97.44     10.002
  Ca: Mg: Fe = 100   0   0
  Ca: Na: K = 6.32   16.21   77.47
  AFM Ratio = 100
 Trace Elements? 9
```

```
  $ ? 1    13-10-80
  Sample=? CY8 EDGE PLAG. NEXT TO ABOVE
 Tot Int= 514102
 ELEM     OX      STRUCT
 Na2O     7.22    1.243
 Al2O3    24.13   2.529
 SiO2     62.03   5.506
 K2O      .93     .108
 CaO      5.55    .528
  Total 100.83    9.9062
  Ca: Mg: Fe = 100   0   0
  Ca: Na: K = 28.13   66.22   5.65
  AFM Ratio = 100
 Trace Elements? 9
```

```
  $ ? 1    13-10-80
  Sample=? CY8 ANOTHER SPOT K-FELDSPAR EDGE
ee
 Tot Int= 561646
 ELEM     OX      STRUCT
 Na2O     2.42    .43
 Al2O3    18.94   2.045
 SiO2     64.56   5.913
 K2O      12.66   1.482
 CaO      1.05    .103
 TiO2     .34     .023
  Total 101.17    9.9968
  Ca: Mg: Fe = 100   0   0
  Ca: Na: K = 5.11   21.34   73.55
  AFM Ratio = 100
 Trace Elements? 9
```

```
  $ ? 1    13-10-80
  Sample=? CY8 EDGE OF PLAG. NEXT TO ABOV
e
 Tot Int= 506055
 ELEM     OX      STRUCT
 Na2O     8.6     1.469
 Al2O3    22.29   2.308
 SiO2     65.35   5.741
 K2O      .43     .048
 CaO      3.17    .278
  Total 99.95     9.8614
  Ca: Mg: Fe = 100   0   0
  Ca: Na: K = 16.45   80.89   2.65
  AFM Ratio = 100
 Trace Elements? 9
```

```
  Sample=? CY8 ANOTHER PLAGIOCLASE
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 471128
 ELEM     OX      STRUCT
 Na2O     8.65    1.492
 MgO      .41     .055
 Al2O3    22.84   2.394
 SiO2     62.34   5.542
 K2O      .37     .042
 CaO      4.98    .475
 FeO      .4      .03
  TOTAL 99.48     10.03
  MG/MG+FE=       64.71
  CA: MG: FE = 84.82   9.82   5.36
  CA: NA: K = 23.64   74.27   2.09
 Trace Elements? 9
```

```
  Sample=? CY8PLAGIOCLASE IN ABOVE
 As before? 0%  T1= 9 Time= 80  EDAX free
 Tot Int= 481447                    OXNO.=? -16
 ELEM     OX      STRUCT
 Na2O     6.67    1.161
 MgO      .35     .047
 Al2O3    25.81   2.731
 SiO2     58.01   5.208
 K2O      .34     .039
 CaO      8.45    .813
 FeO      .36     .027
  TOTAL 100.42    10.026
  MG/MG+FE=       63.51
  CA: MG: FE = 91.66   5.3   3.04
  CA: NA: K = 40.39   57.68   1.94
 Trace Elements? 9
```

```
 Sample=? CY8 K-FELDSPAR NEXT TO ABOVE
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 526494                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    2.24    .398
Al2O3   18.23   1.971
SiO2    65.27   5.986
K2O     13.31   1.557
CaO      .95    .093
 TOTAL 102.63  10.005
 CA: MG: FE = 100  0  0
 CA: NA: K = 4.54  19.43  76.03
Trace Elements? 9

 $ ? 14
 DRIFT ? 1.0263   TOTAL DRIFT= 1.11358


 Sample=? CY8PLAGIOCLASE PHENOCRYST
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 480378                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    6.43    1.12
MgO      .32    .042
Al2O3   26.17   2.772
SiO2    57.54   5.171
K2O      .35    .04
CaO     8.87    .854
FeO      .32    .024
 TOTAL 101.67  10.023
 MG/MG+FE=     63.64
 CA: MG: FE = 92.83  4.57  2.61
 CA: NA: K = 42.4  55.61  1.99
Trace Elements? 9

 $ ? 1


 Sample=? CY8K-FELDSPAR ABOUT ABOVE
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 518959                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    2.87    .507
Al2O3   18.54   1.99
SiO2    65.4    5.956
K2O     11.65   1.353
CaO      .98    .096
TiO2     .57    .039
 TOTAL 101.35  9.941
 CA: MG: FE = 100  0  0
 CA: NA: K = 4.91  25.92  69.17
Trace Elements? 9


 Sample=? CY8 ANOTHER PLAGIOCLASE IN ABOVE\?
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 473959                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    7.89    1.364
MgO      .35    .046
Al2O3   23.96   2.519
SiO2    60.8    5.423
K2O      .42    .048
CaO     6.31    .603
FeO      .27    .02
 TOTAL 101.48  10.023
 MG/MG+FE=     69.7
 CA: MG: FE = 90.13  6.88  2.99
 CA: NA: K = 29.93  67.69  2.38
Trace Elements? 9


 Sample=? CY8PYROXENE                    OXNO.=? -6
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 509280
ELEM     OX     STRUCT
Na2O     .96    .071
MgO      10     .572
Al2O3   3.16    .143
SiO2    49.61   1.902
CaO     22.35   .918
TiO2     .37    .011
MnO      .8     .026
FeO     12.76   .409
 TOTAL 104.81  4.052
 MG/MG+FE=     58.31
 CA: MG: FE = 48.34  30.12  21.54
 CA: NA: K = 92.82  7.18  0
Trace Elements? 9


 Sample=? CY8ANOTHER K-FELDSPAR
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 515989                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    2.7     .477
Al2O3   18.78   2.022
SiO2    64.8    5.917
K2O     11.93   1.389
CaO     1.2     .118
TiO2     .6     .041
 TOTAL 100.41  9.96399
 CA: MG: FE = 100  0  0
 CA: NA: K = 5.95  24.04  70.01
Trace Elements? 9


 Sample=? CY8K_FELDSPAR
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 515592
ELEM     OX     STRUCT
Na2O    3.4     .6
Al2O3   18.18   1.95
SiO2    66.06   6.013
K2O     11.59   1.346
CaO      .77    .075
 TOTAL 102.19  9.984
 CA: MG: FE = 100  0  0
 CA: NA: K = 3.71  29.69  66.6
Trace Elements? 9


 Sample=? CY8K-FELDSPAR                  OXNO.=?
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 514576
ELEM     OX     STRUCT
Na2O    2.86    .505
Al2O3   18.71   2.009
SiO2    65.05   5.928
K2O     11.65   1.354
CaO      .95    .093
TiO2     .78    .054
 TOTAL 99.56   9.94299
 CA: MG: FE = 100  0  0
 CA: NA: K = 4.76  25.87  69.36
Trace Elements? 9


 Sample=? CY8 ANOTHER K-FELDSPAR
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 513761                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    2.98    .527
Al2O3   18.76   2.018
SiO2    64.75   5.908
K2O     11.61   1.352
CaO     1.09    .107
TiO2     .8     .055
 TOTAL 99.48   9.967
 CA: MG: FE = 100  0  0
 CA: NA: K = 5.39  26.54  68.08
Trace Elements? 9


 Sample=? DEL. REPEAT\? 1? 2? 3? -1
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 484195                          OXNO.=? -6
ELEM     OX     STRUCT
Na2O     .61    .043
MgO     16.13   .874
Al2O3   4.97    .213
SiO2    52.15   1.896
CaO     20.86   .813
TiO2     .52    .014
Cr2O3    .7     .02
FeO     4.07    .124
 TOTAL 100.16  3.997
 MG/MG+FE=     87.58
 CA: MG: FE = 44.89  48.26  6.85
 CA: NA: K = 94.98  5.02  0
Trace Elements? 9


 Sample=? CY8 K-FELDSPAR
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 536191                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    1.36    .243
Al2O3   17.78   1.929
SiO2    65.46   6.025
K2O     14.62   1.717
CaO      .78    .077
 TOTAL 103.04  9.991
 CA: MG: FE = 100  0  0
 CA: NA: K = 3.78  11.93  84.29
Trace Elements? 9
```

Sample=? CY8 K-FELDSPAR PHENOCRYST
As before? 0% TI= 9 Time= 80 EDAX free
Tot Int= 520243 OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.32	.566
Al2O3	18.14	1.949
SiO2	65.89	6.006
K2O	11.81	1.373
CaO	.84	.082

TOTAL 100.35 9.996
CA: MG: FE = 100 0 0
CA: NA: K = 4.02 28.71 67.27
Trace Elements? 9

Sample=? CY8 EDGE PLAGE FELDSPAR
As before? 0
TI= 9 Time= 80 EDAX free OXNO.=? -16
Tot Int= 518916

ELEM	OX	STRUCT
Na2O	7.12	1.221
Al2O3	24.57	2.561
SiO2	62.08	5.491
K2O	.63	.071
CaO	5.6	.53

Total 100.21 9.8747
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 29.09 67.01 3.9
AFM Ratio = 100
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 K-FELDSPAR NEXT TO ABOVE
Tot Int= 564560 Time= 80 EDAX free

ELEM	OX	STRUCT
Na2O	2.63	.469
Al2O3	18.78	2.035
SiO2	64.42	5.921
K2O	12.8	1.501
CaO	1.22	.12

Total 101.49 10.0461
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.74 22.44 71.82
AFM Ratio = 100
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 ANOTHER SPOT EDGE PLAG.
Tot Int= 497928 Time= 80 EDAX free

ELEM	OX	STRUCT
Na2O	7.96	1.357
Al2O3	22.8	2.363
SiO2	64.6	5.879
K2O	.47	.052
CaO	4.17	.392

Total 96.73 9.8437
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 21.77 75.35 2.89
AFM Ratio = 100
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 K-FELDSPAR NEXT TO ABOVE
Tot Int= 547406. Time= 80 EDAX free

ELEM	OX	STRUCT
Na2O	4.07	.715
Al2O3	18.95	2.026
SiO2	65.62	5.951
K2O	10.26	1.187
CaO	1.1	.107

Total 100.04 9.9866
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.33 35.59 59.08
AFM Ratio = 100
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 ANOTHER SPOT EDGE PLAG.
Tot Int= 518473 Time= 80 EDAX free

ELEM	OX	STRUCT
Na2O	7.07	1.214
Al2O3	24.77	2.586
SiO2	61.72	5.467
K2O	.45	.05
CaO	5.85	.554

Total 100.19 9.8715
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 30.47 66.78 2.75
AFM Ratio = 100
Trace Elements? 9

Sample=? CY8 K-FELDSPAR NEXT TO ABOVE
Tot Int= 561845

ELEM	OX	STRUCT
Na2O	3.1	.55
Al2O3	19.11	2.05
SiO2	64.42	5.894
K2O	11.44	1.336
CaO	1.42	.139
FeO	.54	.04

Total 99.4 10.0185
Mg/Mg+Fe= 0
Ca: Mg: Fe = 77.65 0 22.35
Ca: Na: K = 6.86 27.16 65.98
AFM Ratio = 96.26
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 ANOTHER SPOT K-FELDSPAR EDGE
ee
Tot Int= 557531

ELEM	OX	STRUCT
Na2O	2.77	.491
Al2O3	19.17	2.066
SiO2	64.23	5.876
K2O	11.91	1.39
CaO	1.39	.137
FeO	.52	.036

Total 99.73 9.9959
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.79 24.33 70.88
AFM Ratio = 100
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 EDGE OF PLAG. NEXT TO ABOVE
e
Tot Int= 514007

ELEM	OX	STRUCT
Na2O	7.34	1.258
Al2O3	24.22	2.525
SiO2	62.52	5.529
K2O	.44	.049
CaO	5.28	.5

Total 100.14 9.8619
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 27.67 69.62 2.71
AFM Ratio = 100
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 ANOTHER SPOT EDGE OF PLAGIOCLA
AX free TI= 9 Time= 80
Tot Int= 519172

ELEM	OX	STRUCT
Na2O	7.04	1.214
Al2O3	24.55	2.574
SiO2	61.18	5.443
K2O	.54	.061
CaO	6.44	.614

Total 100.48 9.9072
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 32.5 64.27 3.23
AFM Ratio = 100
Trace Elements? 9

$? 1 13-10-80
Sample=? CY8 ANOTHER SPOT K-FELDSPAR EDGE
ree
Tot Int= 559232

ELEM	OX	STRUCT
Na2O	2.87	.509
Al2O3	18.94	2.04
SiO2	65.07	5.946
K2O	12.04	1.403
CaO	.92	.09

Total 101.53 9.9896
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.5 25.42 70.08
AFM Ratio = 100
Trace Elements? 9

```
 SAMPLE=? CY13 FINE GM. CRYSTALS 1
 SABEFORE? 0
 TOT INT=        532351          OXNO.=? -16
 ELEM     OX     STRUCT
 NA20    1.13    .2
 AL203   18.16   1.956
 SI02    65.99   6.031
 K20     13.56   1.581
 CAO     1.15    .112
  TOTAL 100  9.882
 TRACE ELEMENTS? 9

 SAMPLE=? CY13 GM. CRYSTAL \? -3  OXNO.=? -16
A BEFORE? 0
  TI= 9 TIME= 80  EDAX FREE
 TOT INT=        559478

 ELEM     OX     STRUCT
 NA20    .75     .134
 AL203   18.12   1.964
 SI02    65.27   6.001
 K20     14.54   1.705
 CAO     1.33    .13
  TOTAL 104.7  9.938
 TRACE ELEMENTS? 9
  $ ? 1

 SAMPLE=? CY13 GM. CRYSTAL \? 3?  OXNO.=? -16
$ BEFORE? 0
  TI= 9 TIME= 80  EDAX FREE
 TOT INT=        552564

 ELEM     OX     STRUCT
 NA20    1.51    .267
 AL203   18.78   2.024
 SI02    65.22   5.964
 K20     12.85   1.499
 CAO     1.29    .126
 FEO     .36     .027
  TOTAL 103.3  9.91
  CA: NA: K = 6.66  14.14  79.2
 TRACE ELEMENTS? 9

 SAMPLE=? CY13 GM. CRYSTAL \? 3? OXNO.=? -16
$ BEFORE? 0
  TI= 9 TIME= 80  EDAX FREE
 TOT INT=        551857
 ELEM     OX     STRUCT
 NA20    1.74    .307
 AL203   18.93   2.034
 SI02    65.44   5.964
 K20     12.26   1.426
 CAO     1.32    .128
 FEO     .31     .023
  TOTAL 103.2  9.885
  CA: NA: K = 6.9  16.5  76.59
 TRACE ELEMENTS? 9

 SAMPLE=? CY13 PHENOCRYST \? 3? -3 OXNO.=? -16
$ BEFORE? 0
  TI= 9 TIME= 80  EDAX FREE
 TOT INT=        524472
 ELEM     OX     STRUCT
  NA20    1.55    .274
 AL203   18.59   2
 SI02    65.35   5.965
 K20     12.85   1.496
 CAO     1.13    .11
 TI02    .53     .036
  TOTAL 98.3  9.885
  CA: NA: K = 5.89  14.58  79.53
 TRACE ELEMENTS? N

 SAMPLE=? CY13 GM. FELDSPAR LIGHT  OXNO.=? -16
SABEFORE? 0
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        458779

ELEM     OX     STRUCT
NA20    10.15   1.707
AL203   19.24   1.967
SI02    70.1    6.082
K20     .49     .054
 TOTAL 97.6  9.812
 CA: NA: K = 0  96.9  3.1
TRACE ELEMENTS? 9

 SAMPLE=? CY13 GM. FELDSPAR LATH LIGHT
S BEFORE? 0                          OXNO.=? -16
 TI= 9 TIME= 80  EDAX FREE
TOT INT=        548421
ELEM     OX     STRUCT
NA20    .39     .069
AL203   18.1    1.965
SI02    65.2    6.005
K20     15.07   1.77
CAO     1.23    .121
 TOTAL 102.5  9.932
 CA: NA: K = 6.19  3.56  90.25
TRACE ELEMENTS? 9

 SAMPLE=? CY13 LIGHT GM. FELDSPAR \?. 3?
SABEFORE? 0
 TI= 9 TIME= 80  EDAX FREE          OXNO.=? -16
TOT INT=        538440
ELEM     OX     STRUCT
NA20    .69     .122
AL203   18.18   1.972
SI02    65.12   5.994
K20     14.77   1.734
CAO     1.25    .122
 TOTAL 100.8  9.947
 CA: NA: K = 6.2  6.2  87.6
TRACE ELEMENTS? 9

 SAMPLE=? CY13 AEGIRINE-AUGITE ? \? 3?
SABEFORE? 0
 TI= 9 TIME= 80  EDAX FREE          OXNO.=? -16
TOT INT=        507138
ELEM     OX     STRUCT
MGO     13.2    .738
AL203   4.04    .178
SI02    49.42   1.854
CAO     23.55   .947
TI02    1.13    .031
FEO     8.66    .271
 TOTAL 102.1  4.023
 CA: MG: FE = 48.39  37.73  13.88
TRACE ELEMENTS? 9

 SAMPLE=? CY13 FELDSPAR PHENOCRYST \? 3?
S BEFORE? 0
 TI= 9 TIME= 80  EDAX FREE          OXNO.=? -16
 TOT INT=        549464
 ELEM     OX     STRUCT
 NA20    1.85    .327
 AL203   19.22   2.072
 SI02    64.65   5.915
 K20     12.53   1.462
 CAO     1.46    .142
 FEO     .32     .024
  TOTAL 103.4  9.945
  CA: NA: K = 7.38  16.95  75.67
 TRACE ELEMENTS? N

 SAMPLE = ? CY13 \? 0 OXNO.=? -16
AS BEFORE? 0
 TI= 9  TIME= 100
EDAX FREE
TOT INT=        399799
ELEM             OX%        STRUCT
AL203            18.1       1.9839
SI02             64.05      5.9553
K20              16.58      1.9663
C
 AO              .85        .085
TIC2             .1         .007
CR203            .13        .0097
FEO              .15        .012
 TOTAL           98.0547    10.0192
TRACE ELEMENTS? 9

SAMPLE = ? CY13 SPHENE IN NEPHELENE REMNANT?
                                     OXNO.=? -5
 TI= 9  TIME= 100
EDAX FREE
TOT INT=        526060
ELEM             OX%        STRUCT
SI02             32.17      1.0577
CAO              29.17      1.0277
TI02             36.18      .8946
FEO              2.48       .0683
 TOTAL           100.393    3.0483
TRACE ELEMENTS? 9
```

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 SAMPLE = ? CY13 GM FELDSPAR      OXNO.=? -16
AS BEFORE? 0
 T1= 9  TIME= 100
EDAX FREE
TOT INT=        406854
ELEM             OX%        STRUCT
AL203           18.39        2.023
SIO2            63.3         5.9092
K20             16.96        2.0229
CAO              .73          .0726
TIO2             .18          .0129
CR203            .13          .0097
FEO              .3           .0231
 TOTAL          99.6457   10.0736
 CA: NA: K = 3.47   0   96.53
TRACE ELEMENTS? 9

 SAMPLE = ? CY13 GM FELDSPAR      OXNO.=? -16
AS BEFORE? 0
 T1= 9  TIME= 100
EDAX FREE
TOT INT=        417107
ELEM             OX%        STRUCT
AL203           18.27        2.009
SIO2            63.45        5.9187
K20             16.91        2.0128
CAO              .84          .0839
TIO2             .2           .014
CR203            .19          .014
FEO              .14          .011
 TOTAL          102.664   10.0634
 CA: NA: K = 4   0   96
TRACE ELEMENTS? 9

 SAMPLE = ? CY13 GM FELDSPAR      OXNO.=? -16
AS BEFORE? 0
 T1= 9  TIME= 100
EDAX FREE
TOT INT=        336051
ELEM             OX%        STRUCT
NA20            7.93         1.3302
AL203           26.77        2.7315
SIO2            64.54        5.5859
K20              .23          .0253
CAO              .28          .026
TIO2             .08          .0054
CR203            .18          .012
 TOTAL          100.973   9.7163
 CA: NA: K = 1.88   96.29   1.83
TRACE ELEMENTS? 9

 SAMPLE = ? CY13 V-MAGNETITE EDGE OF ABOVE
AS BEFORE? 0
 T1= 9  TIME= 100                 OXNO.=? -8
EDAX FREE
TOT INT=        491515
ELEM             OX%        STRUCT
AL203            .91          .0945
SIO2            3.21         .2835
K20              .96          .1086
CAO              .59          .0556
TIO2            3.37         .2239
CR203            .37          .0255
MNO             1.3          .0976
FEO            89.31        6.5992
 TOTAL          103.852   7.4884
TRACE ELEMENTS? 9
 S ? 1

 SAMPLE = ? CY13 GM FELDSPAR      OXNO.=? -16
AS BEFORE? 0
 T1= 9  TIME= 100
EDAX FREE
TOT INT=        403950
ELEM             OX%        STRUCT
AL203           18.35        2.0197
SIO2            63.23        5.9055
K20             17.15        2.0438
CAO              .87          .0868
TIO2             .23          .0164
CR203            .16          .0119
 TOTAL          99.7254   10.0841
 CA: NA: K = 4.07   0   95.93
TRACE ELEMENTS? 9

 SAMPLE = ? CY13 EDGE PHENOCRYST  OXNO.=? -16
AS BEFORE? 0
 T1= 9  TIME= 100
EDAX FREE
TOT INT=        441814
ELEM             OX%        STRUCT
AL203           19.27        2.0941
SIO2            63.45        5.8486
K20             14.78        1.7362
CAO              1.23         .1216
TIO2             1.1          .0763
CR203            .16          .0128
 TOTAL          103.524   9.8916
 CA: NA: K = 6.54   0   93.46
TRACE ELEMENTS? 9

 Sample=? CY 13 ANALCITE          OXNO.=?
As before? 0
 T1= 9 Time= 80  EDAX free
Tot Int= 429567
ELEM     OX      STRUCT
Na20     11.94    .877
Al203    27.76   1.268
SiO2     59.76   2.316
CaO       .42     .017
 Total 87.08    4.4564
 Ca: Ms: Fe = 100   0   0
 Ca: Na: K = 1.56   98.14   0
 AFM Ratio = 100
Trace Elements? 9

 Sample=? CY 13 PYROXENE CLEAR CENT
As before? 0                      OXNO.=? -
 T1= 9 Time= 80  EDAX free
Tot Int= 528525
ELEM     OX      STRUCT
Na20      .61     .044
MgO      14.5     .806
Al203     2.03    .089
SiO2     51.57   1.924
CaO      23.48    .938
TiO2      .55     .015
FeO       7.11    .222
 Total 105.19   4.0386
 Mg/Mg+Fe=      78.4
 Ca: Mg: Fe = 47.71   41   11.29
 Ca: Na: K = 95.52   4.48   0
 AFM Ratio = 4.15
Trace Elements? 9

 Sample=? CY 13 PYROXENE DARKER GREY - EDGE
Tot Int= 521230
ELEM     OX      STRUCT
Na20     1.69    .128
MgO      8.33    .485
Al203    3.35    .154
SiO2    48.18   1.88
CaO     21.58    .902
TiO2     .43     .013
MnO      .6      .02
FeO     15.69    .512
 Total 103.76   4.0941
 Mg/Mg+Fe=      48.65
 Ca: Mg: Fe = 47.5   25.54   26.96
 Ca: Na: K = 87.57   12.43   0
 AFM Ratio = 7.17
Trace Elements? 9

 Sample=? CY 13 AS ABOVE  FELDSPAR WITH CLOU
-16
As before? 0
 T1= 9 Time= 80  EDAX free
Tot Int= 436521
ELEM     OX      STRUCT
Na20     11      1.905
Al203    28.01   2.949
SiO2     58.61   5.234
K20       1.85    .211
CaO       .53     .05
 Total 88.84   10.3488
 Ca: Mg: Fe = 100   0   0
 Ca: Na: K = 3.31   87.95   8.74
 AFM Ratio = 100
Trace Elements? 9
```

CY15, CY17

Sample:? CY15 K-FELDSPAR PHENOCRYST
As before? Ox Ti 9 Time 80 EDAX free
Tot Int [illegible] OXNO.? -16

ELEM	OX	STRUCT
Na2O	2.[illegible]	.40[illegible]
Al2O3	18.[illegible]	2.019
SiO2	64.[illegible]	5.25[illegible]
K2O	13.1[illegible]	1.[illegible]74
CaO	.92	.091
TOTAL	9[illegible].61	10.06[illegible]

CA: MG: FE = 100 0 0
CA: NA: K = 4.10 20.05 75.49
Trace Elements? Y? 9

Sample:? CY17 AMPHIBOLE
As before? Ox Ti 9 Time 80 EDAX free
Tot Int = [illegible]4901 OXNO.? [illegible]

ELEM	OX	STRUCT
Na2O	2.31	.672
MgO	9.7	2.17[illegible]
Al2O3	11.8	2.[illegible]
SiO2	39.46	5.[illegible]86
K2O	2.11	.40[illegible]
CaO	11.75	1.894
TiO2	2.55	[illegible]
MnO	.37	.04[illegible]
FeO	17.93	2.25[illegible]
TOTAL	[illegible]	16.[illegible]

MG/(MG+FE) = 49.09
CA: MG: FE = 29.[illegible] 34.[illegible] 35.67
CA: NA: K = 63.75 22.62 13.63
Trace Elements? 9

Sample:? CY17 ANOTHER AMPHIBOLE
As before? Ox Ti 9 Time [illegible] EDAX free
Tot Int= 472992

ELEM	OX	STRUCT
Na2O	2.33	.70
MgO	6.55	[illegible]
Al2O3	14.17	2.[illegible]
SiO2	37.2	[illegible]
K2O	[illegible]	[illegible]
CaO	[illegible]	[illegible]
TiO2	[illegible].92	[illegible]
MnO	.22	[illegible]
FeO	23.[illegible]	3.0[illegible]
TOTAL	97.37	16.[illegible]

MG/(MG+FE) = [illegible]
CA: MG: FE = 29.[illegible] 33.[illegible] [illegible]
CA: NA: K = 60.[illegible] 22.[illegible] [illegible]
Trace Elements? 9

Sample:? CY17 ANOTHER AMPHIBOLE
As before? Ox Ti 9 Time 80 EDAX free
Tot Int 474739 OXNO.=? -23

ELEM	OX	STRUCT
[illegible]	[illegible]	.338
[illegible]	[illegible]	1.272
[illegible]	[illegible]	[illegible]
SiO2	37.[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
TiO2	[illegible].35	.27[illegible]
MnO	.37	[illegible]
FeO	20.6[illegible]	2.[illegible]47
TOTAL	[illegible]	16.[illegible]

MG/(MG+FE) = 40.[illegible]
CA: MG: FE = 29.95 20.12 51.89
CA: NA: K = 63.[illegible] 19.50 17.12
Trace Elements? 9

Sample:? CY17 AMPHIBOLE
As before? Ox Ti 9 Time 80 EDAX free
Tot Int 47,736 OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.[illegible]	[illegible]
MgO	5.9[illegible]	1.[illegible]
Al2O3	14.17	2.[illegible]
SiO2	44.79	5.734
K2O	2.39	.503
CaO	11.[illegible]	1.846
TiO2	1.9[illegible]	[illegible]
MnO	.3[illegible]	[illegible]
FeO	24.5[illegible]	3.1[illegible]
TOTAL	9[illegible]	16.[illegible]

MG/(MG+FE) = 30.22
CA: MG: FE = 27.09 21.45 49.48
CA: NA: K = 61.74 21.22 16.84
Trace Elements? 9

Sample:? CY17 AMPHIBOLE
[illegible]

ELEM	OX	STRUCT
Na2O	2.0[illegible]	[illegible]
MgO	10.74	[illegible]
Al2O3	11.03	[illegible]
SiO2	[illegible]	[illegible]
K2O	[illegible]	.5[illegible]
CaO	11.[illegible]	1.8[illegible]
TiO2	[illegible].30	[illegible]
MnO	[illegible]	[illegible]
FeO	[illegible]	[illegible]
TOTAL	[illegible]	[illegible]

[illegible]
CA: NA: K = [illegible] [illegible] [illegible].18
Trace Elements? [illegible]

[illegible]

ELEM	OX	STRUCT
Na2O	[illegible].02	[illegible]
MgO	6.09	[illegible]
Al2O3	[illegible]	[illegible]
SiO2	[illegible]	[illegible]
K2O	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
FeO	24.06	[illegible]
TOTAL	[illegible]	[illegible]

MG/(MG+FE) = [illegible]
CA: MG: FE = [illegible] [illegible] [illegible]
CA: NA: K = [illegible] 20.47 [illegible]
Trace Elements? [illegible]

Sample=? CY18 PLAG. FELDSPAR
Tot Int=498424
ELEM OX STRUCT
Na2O 6.87 1.179
Al2O3 23.79 2.482
SiO2 62.75 5.555
K2O 1.09 .123
CaO 5.43 .515
Total 96.67 9.8547
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 28.34 64.89 6.77
AFM Ratio = 100
Trace Elements? 9

Sample=? CY18 AMPHIBOLE
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 475497 OXNO.=? -23
ELEM OX STRUCT
Na2O 2.91 .673
MgO 10.26 2.303
Al2O3 13.58 2.401
SiO2 52.34 5.902
K2O 3.04 .391
CaO 11.92 1.857
TiO2 2.14 .242
FeO 13.85 2.373
TOTAL 110.02 16.162
MG/MG+FE= 49.25
CA: MG: FE = 28.47 28.5 43.032
CA: NA: K = 65.07 35.04 13.89
Trace Elements? 9

Sample=? CY18 AMPHIBOLE 1
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 459171 OXNO.=? -23
ELEM OX STRUCT
Na2O 2.29 .677
MgO 8.01 1.82
Al2O3 13.64 2.452
SiO2 52.29 5.985
K2O 2.07 .404
CaO 12.02 1.799
TiO2 1.52 .186
MnO .66 .085
FeO 23.41 2.73
TOTAL 93.84 16.137
MG/MG+FE= 40
CA: MG: FE = 28.34 28.67 43
CA: NA: K = 62.49 23.52 14
Trace Elements? 9

Sample=? CY18 AMPHIBOLE
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 482423 OXNO.=? -23
ELEM OX STRUCT
Na2O 2.19 .737
MgO 5.52 1.504
Al2O3 15.53 2.806
SiO2 52.16 5.699
K2O 1.65 .323
CaO 11.57 1.901
TiO2 2.1 .242
MnO .67 .083
FeO 21.92 2.81
TOTAL 92.36 16.104
MG/MG+FE= 36.05
CA: MG: FE = 30.2 29.16 44.63
CA: NA: K = 64.2 24.89 10.91
Trace Elements? 9

Sample=? CY18 AMPHIBOLE
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 471 60 OXNO.=? -23
ELEM OX STRUCT
Na2O 2.42 .711
MgO 11.16 2.474
Al2O3 13.54 2.371
SiO2 [illegible] 5.79
K2O 1.54 .411
CaO [illegible] 1.805
TiO2 [illegible] .191
FeO 12.85 2.076
TOTAL [illegible] 16.078
MG/MG+FE= 54.14
CA: MG: FE [illegible] 36.04 32.12
CA: NA: K = 64.3 24.92 10.78
Trace Elements? 9

Sample=? CY18 FELDSPAR
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 499648 OXNO.=? -16
ELEM OX STRUCT
Na2O 9.91 1.692
Al2O3 21.2 2.201
SiO2 65.74 5.791
K2O .72 .081
CaO 2.43 .23
TOTAL 101.12 9.995
CA: MG: FE = 100 0 0
CA: NA: K = 11.48 84.47 4.04
Trace Elements? 9

Sample=? CY18 FELDSPAR
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 495320 OXNO.=?
ELEM OX STRUCT
Na2O 10.84 1.847
Al2O3 21.03 2.179
SiO2 66.19 5.818
K2O .28 .031
CaO 1.67 .157
TOTAL 101.96 10.032
CA: MG: FE = 100 0 0
CA: NA: K = 7.71 90.76 1.52
Trace Elements? 9

Sample=? CY18 K-FELDSPAR
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 570502 OXNO.=? -16
ELEM OX STRUCT
Na2O .59 .107
Al2O3 18.44 2.013
SiO2 64.26 5.952
K2O 15.77 1.863
CaO .95 .094
TOTAL 101.53 10.029
CA: MG: FE = 100 0 0
CA: NA: K = 4.55 5.18 90.26
Trace Elements? 9

Sample=? CY18 FELDSPAR
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 490114 OXNO.=? -16
ELEM OX STRUCT
Na2O 7.87 1.359
Al2O3 23.96 2.514
SiO2 61.59 5.482
K2O 1.05 .119
CaO 5.53 .527
TOTAL 97.03 10.001
CA: MG: FE = 100 0 0
CA: NA: K = 26.28 67.78 5.94
Trace Elements? 9

Sample=? CY18FELDSPAR
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 488577 OXNO.=? -16
ELEM OX STRUCT
Na2O 10.68 1.811
Al2O3 19.76 2.039
SiO2 68.07 5.955
K2O .33 .036
CaO 1.16 .109
TOTAL 99.66 9.949
CA: MG: FE = 100 0 0
CA: NA: K = 5.57 92.59 1.84
Trace Elements? 9

Sample=? CY18FELDSPAR
As before? 0% T1= 9 Time= 80 EDAX free
Tot Int= 510033 OXNO.=? -16
ELEM OX STRUCT
Na2O 7.25 1.251
Al2O3 24.56 2.575
SiO2 61.16 5.44
K2O 1.2 .137
CaO 5.55 .529
TiO2 .25 .017
TOTAL 100.48 9.949
CA: MG: FE = 100 0 0
CA: NA: K = 27.6 65.26 7.15
Trace Elements? 9

```
Sample=? CY18 FELDSPAR INCLUSION IN GROUN
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 509551                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    7.74    1.337
Al2O3   24.26   2.549
SiO2    61.12   5.448
K2O      1.16    .132
CaO      5.74    .548
 TOTAL 101.74  10.014
 CA: MG: FE = 100  0  0
 CA: NA: K = 27.17  66.29  6.54
Trace Elements? 9

Sample=? CY18 FELDSPAR
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 509147                          OXNO.=? -16
ELEM     OX     STRUCT
Na2O    8.02    1.386
Al2O3   24.27   2.603
SiO2    60.48   5.39
K2O      .52     .059
CaO     6.23     .595
 TOTAL 102.14  10.033
 CA: MG: FE = 100  0  0
 CA: NA: K = 29.17  67.94  2.89

Sample=? CY18 AMPHIBOLE
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 491404                          OXNO.=? -23
ELEM     OX     STRUCT
Na2O    2.14    .637
MgO     7.43    1.697
Al2O3  12.68   2.29
SiO2   39.64   6.073
K2O     2.04    .398
CaO    11.32   1.858
TiO2    1.7     .196
MnO      .57     .074
FeO    22.47   2.88
 TOTAL 100.21  16.103
 MG/MG+FE=     37.08
 CA: MG: FE = 28.87  26.37  44.76
 CA: NA: K = 64.22  22.02  13.76
Trace Elements? 9

Sample=? CY18 AMPH.  SAMPLE OFF. EDGE
As before? 0%  T1= 9 Time= 80  EDAX free
Tot Int= 478865                          OXNO.=? -23
ELEM     OX     STRUCT
MgO     2.21    .432
Al2O3   22.84   3.54
SiO2    58.57   7.699
CaO      .53     .075
TiO2     .35     .035
Cr2O3    .26     .027
FeO     15.23   1.675
 TOTAL 93.88  13.483
 MG/MG+FE=  20.5
 CA: MG: FE = 3.44  19.8  76.76
 CA: NA: K = 100  0  0
Trace Elements? 9
```

```
 SAMPLE=? CY19 CENTRE OF ABOVE  OXNO.=? -12
SABEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        530750
ELEM     OX     STRUCT
MGO     .55     .067
AL2O3   8.79    .862
SIO2    36      2.997
CAO     31.57   2.815
TIO2    3.95    .247
MNO     1.34    .094
FEO     17.8    1.239
 TOTAL 103.2   8.325
TRACE ELEMENTS? 9CE $ ? 1

 SAMPLE=? CY19 LIGHT GM. FROM ABOVE
S BEFORE? 0                          OXNO.=? -16
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        523168
ELEM     OX     STRUCT
NA2O    3.06    .535
AL2O3   18.56   1.975
SIO2    66.74   6.028
K2O     10.61   1.222
CAO     1.02    .093
 TOTAL 99.2    9.862
 CA: NA: K = 5.32   28.85   65.83
TRACE ELEMENTS? 9

 SAMPLE=? CY19 AV. GM.               OXNO.=? -16
S BEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        514142
ELEM     OX     STRUCT
NA2O    3.49    .614
AL2O3   19.2    2.055
SIO2    65.27   5.927
K2O     10.44   1.21
CAO     1.32    .127
FEO     .3      .022
 TOTAL 99.8    9.959
 CA: NA: K = 6.55   31.48   61.97
TRACE ELEMENTS? 9

 SAMPLE=? CY19 AV. GM. NEAR ABOVE
SABEFORE? 0                          OXNO.=? -16
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        514716
ELEM     OX     STRUCT
NA2O    3.81    .671
AL2O3   19.35   2.071
SIO2    65.16   5.917
K2O     10.36   1.2
CAO     .99     .096
FEO     .33     .025
 TOTAL 100.3   9.983
 CA: NA: K = 4.91   34.12   60.97
TRACE ELEMENTS? 9

 SAMPLE=? CY19 GARNET        OXNO.=? -12
AS BEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        491486
ELEM     OX     STRUCT
AL2O3   7.78    .769
SIO2    36.45   3.058
CAO     32.18   2.393
TIO2    3.02    .19
CR2O3   .26     .017
MNO     1.19    .084
FEO     19.1    1.34
 TOTAL 93.2    8.355
TRACE ELEMENTS? N

 SAMPLE=? CY19 LARGE PHENOCRYST CENTRE
S BEFORE? 0
 T1= 9 TIME= 80  EDAX FREE           OXNO.=? -16
TOT INT=        536255
ELEM     OX     STRUCT
NA2O    2.14    .376
AL2O3   19.2    2.052
SIO2    65.52   5.943
K2O     11.38   1.317
CAO     1.33    .129
TIO2    .42     .028
 TOTAL 101.9   9.848
 CA: NA: K = 7.08   20.67   72.24
TRACE ELEMENTS? 9

 SAMPLE=? CY19 EDGE OF ABOVE
SABEFORE? 0                          OXNO.=? -16
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        534437
ELEM     OX     STRUCT
NA2O    2.41    .423
AL2O3   19.27   2.058
SIO2    65.52   5.936
K2O     10.95   1.265
CAO     1.4     .135
TIO2    .43     .029
 TOTAL 101.2   9.849
 CA: NA: K = 7.44   23.22   69.34

 SAMPLE=? CY19 LARGE PHENOCRYST   OXNO.=? -16
SABEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        536244
ELEM     OX     STRUCT
NA2O    2.08    .365
AL2O3   20.01   2.14
SIO2    63.81   5.79
K2O     10.75   1.243
CAO     1.39    .134
TIO2    1.97    .134
 TOTAL 100.1   9.809
 CA: NA: K = 7.72   20.95   71.33
TRACE ELEMENTS? 9

 SAMPLE=? CY19 AMPHIBOLE      OXNO.=? -23
AS BEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        506676
ELEM     OX     STRUCT
NA2O    3.07    .868
AL2O3   12      2.061
SIO2    49.18   7.17
K2O     3.36    .625
CAO     18.32   2.861
TIO2    2.49    .272
MNO     .76     .094
FEO     10.82   1.319
 TOTAL 98.6    15.273
TRACE ELEMENTS? N

 SAMPLE=? CY19 FELLDSPAR PHENOCRYST
S BEFORE? 0                          OXNO.=? -6
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        532970
ELEM     OX     STRUCT
NA2O    3.38    .222
AL2O3   18.84   .751
SIO2    66.4    2.248
K2O     10.06   .434
CAO     1.33    .048
 TOTAL 103.9   3.705
 CA: NA: K = 6.84   31.51   61.65

 SAMPLE=? CY19  GARNET        OXNO.=? -12
AS BEFORE? 0
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        500015
ELEM     OX     STRUCT
AL2O3   6.37    .636
SIO2    35.96   3.048
CAO     32.15   2.92
TIO2    3.7     .236
CR2O3   .28     .018
MNO     1.34    .096
FEO     20.21   1.432
 TOTAL 95.7    8.39
TRACE ELEMENTS? 9

 SAMPLE=? CY19 AMPHIBOLE
SABEFORE? 0                          OXNO.=? -23
 T1= 9 TIME= 80  EDAX FREE
TOT INT=        444986
ELEM     OX     STRUCT
NA2O    1.81    .545
MGO     5.92    1.373
AL2O3   13.74   2.52
SIO2    37.67   5.863
K2O     2.41    .478
CAO     11.74   1.957
TIO2    1.63    .191
MNO     .68     .09
FEO     24.38   3.173
 TOTAL 98.5    16.193
TRACE ELEMENTS? 9
```

SAMPLE=? CY19 FELDSPAR PHENOCRYST

ELEM	OX	STRUCT	OXNO.=? -16
NA20	2.36	.415	
AL203	19.31	2.066	
SIO2	65.14	5.912	
K20	11.21	1.298	
CAO	1.32	.127	
TIO2	.65	.044	
TOTAL	100	9.865	

CA: NA: K = 6.94 22.54 70.51

Sample=? CY19 FELDSPATHOID ANALCITE?

ELEM	OX	STRUCT	OXNO.=? -7
Na20	12.51	.949	
Al203	28	1.291	
Si02	57.93	2.267	
K20	.63	.031	
CaO	.91	.038	
TOTAL	88.16	4.576	

CA: MG: FE = 100 0 0

CA: NA: K = 3.73 93.22 3.05

Sample=? CY19 ANALCITE?\? 1? OXNO.=? -7

ELEM	OX	STRUCT
Na20	12.7	.959
Al203	27.04	1.242
Si02	59.47	2.317
K20	.49	.025
CaO	.29	.012
TOTAL	88	4.555

CA: MG: FE = 100 0 0

CA: NA: K = 1.2 96.29 2.51

Sample=? CY19 ANALCITE PATCH OXNO.=? -7

ELEM	OX	STRUCT
Na20	12.92	.979
Al203	26.66	1.227
Si02	59.39	2.32
K20	.62	.031
CaO	.35	.015
Total	86.98	4.5714

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 1.46 95.51 3.02

Sample=? CY19 AGAIN ANOTHER PART OXNO.=? -7

ELEM	OX	STRUCT
Na20	12.68	.958
Al203	26.75	1.228
Si02	59.72	2.326
K20	.52	.026
CaO	.31	.013
Total	86.19	4.5514

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 1.3 96.09 2.61

AFM Ratio = 100

Sample=? CY19 GREEN PYROXENE? OXNO.=? -6

ELEM	OX	STRUCT
Na20	1.46	.112
MgO	6.49	.383
Al203	5.68	.265
Si02	45.72	1.808
CaO	20.85	.884
TiO2	.55	.016
MnO	.76	.025
FeO	18.34	.607
Total	101.8	4.0989

Mg/Mg+Fe= 38.69

Ca: Mg: Fe = 47.17 20.44 32.39

Ca: Na: K = 88.76 11.24 0

AFM Ratio = 11.8

Sample=? CY19 PPLAGIOCLASE FELDSPAR

ELEM	OX	STRUCT	OXNO.=? -16
Na20	5.99	1.033	
Al203	25.21	2.643	
Si02	60.79	5.407	
K20	1.52	.172	
CaO	6.49	.619	
Total	97.37	9.8744	

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 33.94 56.63 9.43

AFM Ratio = 100

Sample=? CY19 PALE GREEN PYROXENE

ELEM	OX	STRUCT	OXNO.=? -6
Na20	1.42	.108	
MgO	7.74	.452	
Al203	2.47	.114	
Si02	49.33	1.933	
CaO	20.1	.844	
MnO	1.48	.049	
FeO	17.16	.562	
Total	101.57	4.0635	

Mg/Mg+Fe= 44.58

Ca: Mg: Fe = 45.43 24.33 30.25

Ca: Na: K = 88.66 11.34 0

AFM Ratio = 5.32

Sample=? CY19 DARKER EDGE OF ABOVE OXNO.=? -6

ELEM	OX	STRUCT
Na20	1.64	.126
MgO	6.14	.362
Al203	6.37	.297
Si02	45.19	1.787
CaO	20.58	.872
TiO2	.61	.018
Cr203	.26	.008
MnO	.77	.026
FeO	18.41	.609
Total	101.74	4.105

Mg/Mg+Fe= 37.28

Ca: Mg: Fe = 47.31 19.64 33.04

Ca: Na: K = 87.37 12.63 0

AFM Ratio = 13.26

Sample=? CY19 FELDSPATHOID OXNO.=? -7

ELEM	OX	STRUCT
Na20	12.9	.979
Al203	27.12	1.252
Si02	58.72	2.299
K20	.69	.034
CaO	.42	.018
Total	85.83	4.5821

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 1.75 94.96 3.3

AFM Ratio = 100

Sample=? CY19 ANOTHER PART OXNO.=? -7

ELEM	OX	STRUCT
Na20	9.93	.754
Al203	24.66	1.139
Si02	61.12	2.396
K20	3.43	.172
CaO	.85	.036
Total	88.09	4.4972

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.74 78.38 17.88

AFM Ratio = 100

Trace Elements? 9

Sample=? CY19 FELDSPATHOID OXNO.=? -7

ELEM	OX	STRUCT
Na20	12.79	.971
Al203	27.25	1.258
Si02	58.6	2.295
K20	.65	.033
CaO	.54	.023
Total	86.5	4.5782

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 2.24 94.55 3.21

AFM Ratio = 100

Sample=? CY19 FELDSPATHOID OXNO.=? -10

ELEM	OX	STRUCT
Na20	12.75	1.381
Al203	27.02	1.78
Si02	58.91	3.291
K20	.62	.044
CaO	.59	.035
Total	83.72	6.5314

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 2.4 94.59 3.01

AFM Ratio = 100

Sample=? CY19 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.01	.181
Al2O3	18.06	1.968
SiO2	64.75	5.985
K2O	15.31	1.805
CaO	.85	.085
TOTAL	102.5	10.024

CA: MG: FE = 100 0 0

CA: NA: K = 4.1 8.74 87.16

Sample=? CY19 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.84	.15
Al2O3	18.08	1.968
SiO2	64.9	5.992
K2O	15.31	1.803
CaO	.85	.084
TOTAL	101.98	9.997

CA: MG: FE = 100 0 0

CA: NA: K = 4.12 7.36 88.51

Sample=? CY19K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.96	.171
Al2O3	18.67	2.032
SiO2	64.13	5.923
K2O	15.05	1.773
CaO	.84	.083
TiO2	.38	.027
TOTAL	101.85	10.009

CA: MG: FE = 100 0 0

CA: NA: K = 4.09 8.44 87.47

Sample=? CY19 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	18.27	1.993
SiO2	64.65	5.982
K2O	16.13	1.904
CaO	.94	.093
TOTAL	101.74	9.972

CA: MG: FE = 100 0 0

CA: NA: K = 4.66 0 95.34

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.93	.167
Al2O3	18.03	1.963
SiO2	64.86	5.992
K2O	15.32	1.806
CaO	.85	.084
TOTAL	102.6	10.012

CA: MG: FE = 100 0 0

CA: NA: K = 4.08 8.12 87.8

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.62	.111
Al2O3	18.61	2.027
SiO2	64.15	5.929
K2O	15.37	1.812
CaO	.83	.082
TiO2	.42	.029
TOTAL	100.53	9.99

CA: MG: FE = 100 0 0

CA: NA: K = 4.09 5.54 90.37

Sample=? CY19 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.67	.121
Al2O3	17.74	1.938
SiO2	64.75	6
K2O	15.66	1.851
CaO	.83	.082
FeO	.35	.027
TOTAL	101.13	10.019
MG/MG+FE=		0

CA: MG: FE = 75.23 0 24.77

CA: NA: K = 3.99 5.89 90.12

Sample=? CY19 ANOTJHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.77	.137
Al2O3	18.52	2.014
SiO2	64.67	5.967
K2O	15.24	1.794
CaO	.81	.08
TOTAL	100.69	9.992

CA: MG: FE = 100 0 0

CA: NA: K = 3.98 6.81 89.21

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.82	.147
Al2O3	17.82	1.941
SiO2	65.01	6.008
K2O	15.48	1.825
CaO	.87	.086
TOTAL	99.06	10.007

CA: MG: FE = 100 0 0

CA: NA: K = 4.18 7.14 88.68

Sample=? CY19 PYROXENE\? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.25	.094
MgO	6.04	.356
Al2O3	7.1	.331
SiO2	44.39	1.754
CaO	21.55	.913
TiO2	1.07	.032
MnO	.58	.019
FeO	18.04	.596
Total	100	4.0938
Mg/Mg+Fe=		37.39

Ca: Mg: Fe = 48.95 17.07 31.98

Ca: Na: K = 90.67 9.33 0

AFM Ratio = 14.81

Sample=? CY19 ANOTHER PYROXENE\

ELEM	OX	STRUCT
Na2O	1.42	.108
MgO	7.08	.413
Al2O3	6.26	.289
SiO2	46	1.801
CaO	21.38	.897
TiO2	.63	.018
MnO	.45	.015
FeO	16.77	.549
Total	99.65	4.0903
Mg/Mg+Fe=		42.93

Ca: Mg: Fe = 48.25 22.22 29.53

Ca: Na: K = 89.25 10.75 0

AFM Ratio = 13.06

Sample=? CY19 PYROXENE CORE\

ELEM	OX	STRUCT
Na2O	1.52	.114
MgO	9.16	.527
Al2O3	3.02	.137
SiO2	49.66	1.916
CaO	20.66	.862
TiO2	.25	.007
MnO	.61	.025
FeO	14.72	.475
Total	101.72	4.065
Mg/Mg+Fe=		52.59

Ca: Mg: Fe = 46.24 28.27 25.48

Ca: Na: K = 88.32 11.68 0

AFM Ratio = 6.4

Sample=? CY19 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	1.3	.099
MgO	7.29	.425
Al2O3	6.86	.317
SiO2	45.42	1.778
CaO	21.55	.904
TiO2	.62	.018
MnO	.45	.016
FeO	16.47	.537
Total	100.38	4.0952
Mg/Mg+Fe=		44.09

Ca: Mg: Fe = 48.39 22.75 28.85

Ca: Na: K = 90.13 9.87 0

AFM Ratio = 14.12

Sample=? CY19 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.01	.181
Al2O3	18.06	1.968
SiO2	64.75	5.985
K2O	15.31	1.805
CaO	.85	.085
TOTAL	102.5	10.024

CA: MG: FE = 100 0 0

CA: NA: K = 4.1 8.74 87.16

Sample=? CY19 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.84	.15
Al2O3	18.08	1.968
SiO2	64.9	5.992
K2O	15.31	1.803
CaO	.85	.084
TOTAL	101.98	9.997

CA: MG: FE = 100 0 0

CA: NA: K = 4.12 7.36 88.51

Sample=? CY19K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.96	.171
Al2O3	18.67	2.032
SiO2	64.13	5.923
K2O	15.05	1.773
CaO	.84	.083
TiO2	.38	.027
TOTAL	101.85	10.009

CA: MG: FE = 100 0 0

CA: NA: K = 4.09 8.44 87.47

Sample=? CY19 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	18.27	1.993
SiO2	64.65	5.982
K2O	16.13	1.904
CaO	.94	.093
TOTAL	101.74	9.972

CA: MG: FE = 100 0 0

CA: NA: K = 4.66 0 95.34

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.93	.167
Al2O3	18.03	1.963
SiO2	64.86	5.992
K2O	15.32	1.806
CaO	.85	.084
TOTAL	102.6	10.012

CA: MG: FE = 100 0 0

CA: NA: K = 4.08 8.12 87.8

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.62	.111
Al2O3	18.61	2.027
SiO2	64.15	5.929
K2O	15.37	1.812
CaO	.83	.082
TiO2	.42	.029
TOTAL	100.53	9.99

CA: MG: FE = 100 0 0

CA: NA: K = 4.09 5.54 90.37

Sample=? CY19 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.67	.121
Al2O3	17.74	1.938
SiO2	64.75	6
K2O	15.66	1.851
CaO	.83	.082
FeO	.35	.027
TOTAL	101.13	10.019

MG/MG+FE= 0

CA: MG: FE = 75.23 0 24.77

CA: NA: K = 3.99 5.89 90.12

Sample=? CY19 ANOTJHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.77	.137
Al2O3	18.52	2.014
SiO2	64.67	5.967
K2O	15.24	1.794
CaO	.81	.08
TOTAL	100.69	9.992

CA: MG: FE = 100 0 0

CA: NA: K = 3.98 6.81 89.21

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.82	.147
Al2O3	17.82	1.941
SiO2	65.01	6.008
K2O	15.48	1.825
CaO	.87	.086
TOTAL	99.06	10.007

CA: MG: FE = 100 0 0

CA: NA: K = 4.18 7.14 88.68

Sample=? CY19 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.01	.181
Al2O3	18.06	1.968
SiO2	64.75	5.985
K2O	15.31	1.805
CaO	.85	.085
TOTAL	102.5	10.024

CA: MG: FE = 100 0 0

CA: NA: K = 4.1 8.74 87.16

Sample=? CY19 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.84	.15
Al2O3	18.08	1.968
SiO2	64.9	5.992
K2O	15.31	1.803
CaO	.85	.084
TOTAL	101.98	9.997

CA: MG: FE = 100 0 0

CA: NA: K = 4.12 7.36 88.51

Sample=? CY19 ANOTJHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.77	.137
Al2O3	18.52	2.014
SiO2	64.67	5.967
K2O	15.24	1.794
CaO	.81	.09
TOTAL	100.69	9.992

CA: MG: FE = 100 0 0

CA: NA: K = 3.98 6.81 89.21

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.82	.147
Al2O3	17.82	1.941
SiO2	65.01	6.008
K2O	15.48	1.825
CaO	.87	.086
TOTAL	99.06	10.007

CA: MG: FE = 100 0 0

CA: NA: K = 4.18 7.14 88.68

Sample=? CY19K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.96	.171
Al2O3	18.67	2.032
SiO2	64.13	5.923
K2O	15.05	1.773
CaO	.84	.083
TiO2	.38	.027
TOTAL	101.85	10.009

CA: MG: FE = 100 0 0

CA: NA: K = 4.09 8.44 87.47

Sample=? CY19 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	18.27	1.993
SiO2	64.65	5.982
K2O	16.13	1.904
CaO	.94	.093
TOTAL	101.74	9.972

CA: MG: FE = 100 0 0

CA: NA: K = 4.66 0 95.34

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.93	.167
Al2O3	18.03	1.963
SiO2	64.86	5.992
K2O	15.32	1.806
CaO	.85	.084
TOTAL	102.6	10.012

CA: MG: FE = 100 0 0

CA: NA: K = 4.08 8.12 87.8

Sample=? CY19 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.62	.111
Al2O3	18.61	2.027
SiO2	64.15	5.929
K2O	15.37	1.812
CaO	.83	.082
TiO2	.42	.029
TOTAL	100.53	9.99

CA: MG: FE = 100 0 0

CA: NA: K = 4.09 5.54 90.37

Sample=? CY19 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.67	.121
Al2O3	17.74	1.938
SiO2	64.75	6
K2O	15.66	1.851
CaO	.83	.082
FeO	.35	.027
TOTAL	101.13	10.019

MG/MG+FE= 0

CA: MG: FE = 75.23 0 24.77

CA: NA: K = 3.99 5.89 90.12

CY20, CY25A

Sample=? CY20 ANOTHER PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.99	1.38
Al2O3	24.04	2.523
SiO2	61.44	5.42
K2O	.99	.112
CaO	5.55	.53
TOTAL	102.36	10.015

CA: MG: FE = 100 0 0

CA: NA: K = 26.21 68.25 5.54

Trace Elements? 9

Sample=? CY20 PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.59	.106
Al2O3	18.76	2.045
SiO2	63.73	5.893
K2O	15.27	1.802
CaO	.91	.09
TiO2	.73	.051
TOTAL	100	9.98699

CA: MG: FE = 100 0 0

CA: NA: K = 4.5 5.31 90.19

Sample=? CY20 ANOTHER PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.28	1.04
Al2O3	13.28	1.337
SiO2	77.8	6.644
K2O	1.46	.159
CaO	1.18	.108
TOTAL	102.62	9.288

CA: MG: FE = 100 0 0

CA: NA: K = 8.26 79.57 12.17

Sample=? CY20 ANOTHER PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.33	1.436
Al2O3	23.71	2.485
SiO2	61.97	5.51
K2O	.95	.108
CaO	5.04	.48
TOTAL	101.8	10.019

CA: MG: FE = 100 0 0

CA: NA: K = 23.72 70.95 5.34

Sample=? CY20 EDGE OF ABOVE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.99	1.377
Al2O3	24.07	2.521
SiO2	61.72	5.483
K2O	.77	.087
CaO	5.44	.518
TOTAL	101.24	9.986

CA: MG: FE = 100 0 0

CA: NA: K = 26.14 69.48 4.39

Sample=? CY20\? CENTRE OF ABOVE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.83	1.354
Al2O3	24.64	2.589
SiO2	60.67	5.408
K2O	.86	.097
CaO	5.99	.572
TOTAL	102.4	10.02

NO SUCH OPTION DUMMY!

CA: NA: K = 28.27 66.93 4.79

Sample=? CY25A FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.62	1.814
Al2O3	21.37	2.218
SiO2	65.52	5.77
K2O	.26	.031
CaO	2.18	.206
TOTAL	102.83	10.039

CA: MG: FE = 100 0 0

CA: NA: K = 10.04 88.44 1.51

Sample=? CY25A EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.42	1.942
Al2O3	20.22	2.09
SiO2	67.3	5.902
K2O	.28	.031
CaO	.8	.075
TOTAL	99.59	10.04

CA: MG: FE = 100 0 0

CA: NA: K = 3.66 94.82 1.51

Sample=? CY25A AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.28	.671
MgO	8.31	1.881
Al2O3	14.47	2.591
SiO2	38.55	5.854
K2O	2.14	.415
CaO	11.42	1.858
TiO2	2.22	.253
MnO	.3	.038
FeO	20.31	2.58
TOTAL	101.17	16.141

MG/MG+FE= 42.17

CA: MG: FE = 29.4 29.77 40.83

CA: NA: K = 63.11 22.79 14.1

Sample=? CY25A CORE GRAINY PART OF FELDSPAR CRYSTAL OX -> ? -16

ELEM	OX	STRUCT
Na2O	8.83	1.517
Al2O3	23	2.402
SiO2	63.21	5.602
K2O	.96	.109
CaO	.4	.38
TOTAL	99.22	10.01

CA: MG: FE = 100 0 0

CA: NA: K = 18.94 75.62 5.43

Sample=? CY25A ANOTHER GRAIN IN INC. OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.37	1.446
Al2O3	24.11	2.532
SiO2	61.22	5.455
K2O	.81	.092
CaO	5.5	.525
TOTAL	102.75	10.05

CA: MG: FE = 100 0 0

CA: NA: K = 25.45 70.09 4.46

Sample=? CY25A FELDSPAR SURROUNDING ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.64	1.81
Al2O3	21.09	2.182
SiO2	66.51	5.839
K2O	.59	.066
CaO	1.16	.109
TOTAL	100	10.006

CA: MG: FE = 100 0 0

CA: NA: K = 5.49 91.18 3.32

Sample=? CY25A CORE GRANULAR MATERIAL PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.95	1.373
Al2O3	24.64	2.586
SiO2	60.8	5.414
K2O	.69	.078
CaO	5.92	.565
TOTAL	100.91	10.016

CA: MG: FE = 100 0 0

CA: NA: K = 28.03 68.11 3.87

Sample=? CY25A MATERIL AT EDGE OF GRAINY PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.63	1.488
Al2O3	23.22	2.434
SiO2	62.36	5.546
K2O	1.04	.118
CaO	4.76	.453
TOTAL	100.93	10.039

CA: MG: FE = 100 0 0

CA: NA: K = 22 72.27 5.73

Sample=? CY26 FELDSPAR? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.89	1.855
Al2O3	19.69	2.038
SiO2	67.79	5.954
K2O	1.25	.14
CaO	.38	.036
TOTAL	97.56	10.023

CA: MG: FE = 100 0 0

CA: NA: K = 1.77 91.33 6.89

Sample=? CY26K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2	.355
Al2O3	18.46	1.999
SiO2	64.97	5.969
K2O	13.76	1.612
CaO	.84	.083
TOTAL	99.61	10.018

CA: MG: FE = 100 0 0

CA: NA: K = 4.05 17.32 78.63

Sample=? CY26 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.06	.19
Al2O3	18.73	2.035
SiO2	64.5	5.945
K2O	14.78	1.738
CaO	.92	.091
TOTAL	101.17	9.999

CA: MG: FE = 100 0 0

CA: NA: K = 4.51 9.41 86.08

Sample=? CY26FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.81	1.843
Al2O3	19.86	2.058
SiO2	67.47	5.932
K2O	1.23	.138
CaO	.64	.061
TOTAL	99.56	10.032

CA: MG: FE = 100 0 0

CA: NA: K = 2.99 90.25 6.76

Sample=? CY26K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.16	.208
Al2O3	18.33	1.998
SiO2	64.43	5.959
K2O	15.23	1.796
CaO	.87	.086
TOTAL	97.78	10.047

CA: MG: FE = 100 0 0

CA: NA: K = 4.11 9.95 85.93

Sample=? CY26 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.55	1.963
Al2O3	19.82	2.048
SiO2	67.77	5.939
K2O	.35	.039
CaO	.49	.046
TOTAL	98.29	10.035

CA: MG: FE = 100 0 0

CA: NA: K = 2.25 95.85 1.9

Sample=? CY26K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.45	.438
Al2O3	18.56	2.012
SiO2	64.63	5.944
K2O	13.54	1.589
CaO	.84	.083
TOTAL	101.71	10.066

CA: MG: FE = 100 0 0

CA: NA: K = 3.23 20.76 75.31

Sample=? CY26K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.35	.419
Al2O3	18.4	1.998
SiO2	64.56	5.946
K2O	13.76	1.617
CaO	.92	.091
TOTAL	100.6	10.071

CA: MG: FE = 100 0 0

CA: NA: K = 4.28 19.7 76.02

Sample=? CY26FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.07	1.391
Al2O3	19.99	2.094
SiO2	66.66	5.922
K2O	4.71	.534
CaO	.57	.055
TOTAL	101.45	9.996

CA: MG: FE = 100 0 0

CA: NA: K = 2.78 70.25 26.97

Sample=? CY26 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.19	1.081
Al2O3	19.16	2.035
SiO2	65.89	5.936
K2O	8.01	.921
CaO	.74	.072
TOTAL	102.62	10.045

CA: MG: FE = 100 0 0

CA: NA: K = 3.47 52.12 44.41

Sample=? CY26 ANDALUSITE???? ANOTHER GRAIN OXNO.=? -10

ELEM	OX	STRUCT
Al2O3	42.12	2.661
SiO2	54.83	2.939
K2O	.54	.037
FeO	2.51	.112
TOTAL	81.04	5.749

MG/MG+FE= 0

CA: MG: FE = 0 0 100

CA: NA: K = 0 0 100

Sample=? CY26 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.38	.944
Al2O3	18.82	2.008
SiO2	65.8	5.955
K2O	9.24	1.067
CaO	.77	.075
TOTAL	99.52	10.049

CA: MG: FE = 100 0 0

CA: NA: K = 3.6 45.25 51.15

Sample=? CY26 FELDSPAR IN CORE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.08	1.882
Al2O3	20.16	2.081
SiO2	67.64	5.925
K2O	.45	.05
CaO	.69	.064
TOTAL	101.46	10.002

CA: MG: FE = 100 0 0

CA: NA: K = 3.21 94.29 2.51

Sample=? CY26 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.62	.984
Al2O3	18.88	2.01
SiO2	65.97	5.959
K2O	8.87	1.022
CaO	.64	.062
TOTAL	99.47	10.037

CA: MG: FE = 100 0 0

CA: NA: K = 3 47.58 49.42

Sample=? CY26 MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	3.53	.726
SiO2	35.47	6.182
CaO	31.47	5.877
TiO2	3.12	.409
MgO	1.36	.2
FeO	25.05	3.651
TOTAL	97.46	17.045

MG/MG+FE= 0

CA: MG: FE = 61.68 0 38.32

CA: NA: K = 100 0 0

CY27

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	[illegible]	[illegible]
Al2O3	18.[illegible]	1.9[illegible]
SiO2	6[illegible].61	[illegible]
K2O	1[illegible].01	1.[illegible]7
CaO	[illegible]	.0[illegible]
TOTAL	98.63	10.006

CA: MG: FE = 100 0 0
CA: NA: K = [illegible] [illegible] [illegible]9.78

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.21	.217
Al2O3	18.23	1.9[illegible]
SiO2	64.[illegible]6	5.961
K2O	15.13	1.784
CaO	.67	.086
TOTAL	99.79	10.04

CA: MG: FE = 100 0 0
CA: NA: K = 4.12 10.4 85.48

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.45	.437
Al2O3	18.31	1.983
SiO2	65.03	5.974
K2O	12.53	1.[illegible]8[illegible]
CaO	.67	.066
TOTAL	[illegible].58	10.035

CA: MG: FE = 100 0 0
CA: NA: K = 3.16 20.92 75.91

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.88	.695
Al2O3	18.97	2.033
SiO2	65.46	5.952
K2O	11.07	1.294
CaO	.62	.06
TOTAL	99.7	10.014

CA: MG: FE = 100 0 0
CA: NA: K = 2.96 33.76 63.28

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.99	.531
Al2O3	18.31	1.974
SiO2	65.48	5.989
K2O	12.75	1.463
CaO	.67	.066
TOTAL	99.52	10.025

CA: MG: FE = 100 0 0
CA: NA: K = 3.2 25.75 71.05

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.1	.55
Al2O3	18.54	1.998
SiO2	65.23	5.947
K2O	12.4	1.446
CaO	.73	.071
TOTAL	99.33	10.032

CA: MG: FE = 100 0 0
CA: NA: K = 3.43 26.61 69.96

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.02	.184
Al2O3	18.22	1.9[illegible]
SiO2	64.58	5.968
K2O	15.25	1.798
CaO	.85	.085
TOTAL	99.9	10.027

CA: MG: FE = 100 0 0
CA: NA: K = 4.11 8.9 86.99

Sample=? CY27 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.95	.524
Al2O3	18.32	1.99[illegible]
SiO2	65.[illegible]	5.97[illegible]
K2O	12.56	1.466
CaO	[illegible]	.0[illegible]
TOTAL	99.78	10.023

CA: MG: FE = 100 0 0
CA: NA: K = 3.21 25.49 71.3

Sample=? CY27 K-FELDSPAR OXNO.=? [illegible]

ELEM	OX	STRUCT
Na2O	[illegible]	.5[illegible]
Al2O3	[illegible]	1.[illegible]
SiO2	[illegible]	[illegible]
K2O	[illegible]	1.[illegible]
CaO	[illegible]	.0[illegible]
TOTAL	[illegible].67	9.9[illegible]

CA: MG: FE = 100 0 0
CA: NA: K = 2.97 24.8 7[illegible]

Sample=? CY27 K-FELDSPAR OXNO.=? [illegible]

ELEM	OX	STRUCT
Na2O	[illegible]	.051
Al2O3	[illegible]	4.3[illegible]
SiO2	[illegible].59	4.[illegible]
K2O	1[illegible].73	1.[illegible]2
CaO	[illegible]	.05[illegible]
FeO	[illegible]	.24[illegible]
TOTAL	[illegible]	10.[illegible]

MG/MG+FE 0
CA: MG: FE = 18.[illegible] 0 81.[illegible]
CA: NA: K = 3.59 5.27 9[illegible].16

Sample=? CY27 K-FELDSPAR OXNO.=?

ELEM	OX	STRUCT
Al2O3	39.51	4.3[illegible]
SiO2	[illegible]	4.2
K2O	1[illegible].37	1.2[illegible]
CaO	[illegible]	.04
FeO	[illegible]	.17
TOTAL	9[illegible].[illegible]9	10.[illegible]

MG/MG+FE 0
CA: MG: FE = 25.[illegible] 0 74.[illegible]
CA: NA: K = 4.15 [illegible] 95.8[illegible]

Sample=? CY K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.06	.367
Al2O3	18.54	2.003
SiO2	65.2	5.977
K2O	13.48	1.526
CaO	.73	.071
TOTAL	97.36	9.994

CA: MG: FE = 100 0 0

CA: NA: K = 3.53 18.22 78.25

Sample=? CY PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	9.83	.564
Al2O3	3.55	.161
SiO2	48.77	1.876
CaO	23.31	.961
TiO2	.48	.014
MnO	.35	.011
FeO	13.69	.44
TOTAL	99.47	4.027

MG/MG+FE= 56.18

CA: MG: FE = 48.91 28.7 22.39

CA: NA: K = 100 0 0

Sample=? CY K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.71	.305
Al2O3	18.35	1.987
SiO2	65.1	5.982
K2O	14.05	1.647
CaO	.81	.08
TOTAL	98.78	10.001

CA: MG: FE = 100 0 0

CA: NA: K = 3.94 15.01 81.05

Sample=? CY K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.44	.433
Al2O3	18.65	2.011
SiO2	65.27	5.971
K2O	12.89	1.504
CaO	.76	.074
TOTAL	97.51	9.993

CA: MG: FE = 100 0 0

CA: NA: K = 3.68 21.53 74.79

Sample=? CY K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.1	.374
Al2O3	19.1	2.067
SiO2	64.52	5.923
K2O	13.47	1.577
CaO	.83	.081
TOTAL	98.71	10.022

CA: MG: FE = 100 0 0

CA: NA: K = 3.99 18.41 77.61

Sample=? CY ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.77	.132
MgO	9.27	.535
Al2O3	1.95	.089
SiO2	49.97	1.934
CaO	20.92	.867
TiO2	.33	.01
MnO	.85	.028
FeO	14.92	.483
TOTAL	100.96	4.078

MG/MG+FE= 52.55

CA: MG: FE = 45.99 28.38 25.62

CA: NA: K = 86.79 13.21 0

Sample=? CY PYROXENE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.54	.116
MgO	8.44	.49
Al2O3	3.53	.162
SiO2	48.24	1.879
CaO	20.93	.873
TiO2	.52	.015
MnO	.65	.021
FeO	16.15	.526
TOTAL	100.23	4.082

MG/MG+FE= 48.23

CA: MG: FE = 46.21 25.94 27.85

CA: NA: K = 88.27 11.73 0

Sample=? CY K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.39	.248
Al2O3	19.82	2.042
SiO2	64.56	5.943
K2O	14.41	1.692
CaO	.83	.081
TOTAL	97.41	10.006

CA: MG: FE = 100 0 0

CA: NA: K = 4.01 12.27 83.72

Sample=? CY K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.59	.283
Al2O3	18.54	2.008
SiO2	64.95	5.969
K2O	14.11	1.654
CaO	.81	.08
TOTAL	97.9	9.994

CA: MG: FE = 100 0 0

CA: NA: K = 3.97 14.03 82

Sample=? CY APLITE PART K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.74	.485
Al2O3	18.29	1.971
SiO2	65.59	5.995
K2O	12.61	1.471
CaO	.78	.077
TOTAL	98.83	9.999

CA: MG: FE = 100 0 0

CA: NA: K = 3.79 23.86 72.36

Sample=? CY APLITE PART K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.47	.439
Al2O3	18.2	1.97
SiO2	65.14	5.983
K2O	13.5	1.582
CaO	.69	.067
TOTAL	101.28	10.041

CA: MG: FE = 100 0 0

CA: NA: K = 3.21 21.02 75.77

Sample=? CY APLITE PART K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.02	.183
Al2O3	18.03	1.962
SiO2	64.86	5.99
K2O	15.18	1.788
CaO	.92	.091
TOTAL	100.77	10.014

CA: MG: FE = 100 0 0

CA: NA: K = 4.41 8.87 86.71

Sample=? CY APLITE PART K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.66	.118
Al2O3	18.06	1.968
SiO2	64.84	5.972
K2O	15.52	1.829
CaO	.92	.091
TOTAL	99.46	9.998

CA: MG: FE = 100 0 0

CA: NA: K = 4.47 5.79 89.74

Sample=? CY APLITE PART FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.17	1.571
Al2O3	22.71	2.366
SiO2	63.79	5.637
K2O	.48	.054
CaO	3.85	.364
TOTAL	97.99	9.99199

CA: MG: FE = 100 0 0

CA: NA: K = 18.3 78.98 2.71

Sample=? CY28A APLITE PART K-FELDSPAR GRAIN IN GROUND MASSS

ELEM	OX	STRUCT
Na2O	.8	.149
Al2O3	14.55	1.886
SiO2	59.17	5.72
K2O	13.64	1.682
CaO	.88	.091
FeO	8.98	.726
TOTAL	97.86	10.254

MG/MG+FE= 0

CA: MG: FE = 11.14 0 88.86

CA: NA: K = 4.73 7.25 87.51

Sample=? CY28FELDSPAR APLITE PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.81	.321
Al2O3	18.06	1.954
SiO2	65.52	6.013
K2O	13.9	1.627
CaO	.71	.07
TOTAL	99.08	9.985

CA: MG: FE = 100 0 0

CA: NA: K = 3.47 15.91 80.62

Sample=? CY28K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.04	.362
Al2O3	18.2	1.968
SiO2	65.35	5.997
K2O	13.68	1.602
CaO	.76	.074
TOTAL	100.83	10.003

CA: MG: FE = 100 0 0

CA: NA: K = 3.63 17.76 78.61

Sample=? CY28 BIOTITE AGAIN OXNO.=? -11

ELEM	OX	STRUCT
MgO	9.05	.943
Al2O3	8.58	.706
SiO2	52.28	3.652
K2O	5.23	.466
CaO	.53	.04
FeO	24.3	1.42
TOTAL	85.69	7.227

MG/MG+FE= 39.91

CA: MG: FE = 1.66 39.24 59.09

CA: NA: K = 7.91 0 92.09

Sample=? CY28FELDSPAR APLITE PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.92	1.352
Al2O3	25.11	2.64
SiO2	60.05	5.355
K2O	.42	.048
CaO	6.6	.631
TOTAL	99.06	10.026

CA: MG: FE = 100 0 0

CA: NA: K = 31.07 66.57 2.36

Sample=? CY28 FELDSPAR APLITE PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.11	1.895
Al2O3	20.22	2.097
SiO2	66.83	5.88
K2O	.51	.057
CaO	1.02	.096
FeO	.33	.025
TOTAL	99.12	10.05

MG/MG+FE= 0

CA: MG: FE = 79.34 0 20.66

CA: NA: K = 4.69 92.53 2.78

Sample=? CY28 K-FELDSPAR APLITE PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.78	.493
Al2O3	18.12	1.957
SiO2	65.42	5.995
K2O	13	1.52
CaO	.69	.067
TOTAL	99.32	10.032

CA: MG: FE = 100 0 0

CA: NA: K = 3.22 23.7 73.08

Sample=? CY28 K-FELDSPAR APLITE PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.68	.301
Al2O3	18.14	1.968
SiO2	65.1	5.991
K2O	14.32	1.682
CaO	.76	.075
TOTAL	100.23	10.017

CA: MG: FE = 100 0 0

CA: NA: K = 3.64 14.63 81.73

Sample=? CY28K-FELDSPAR APLITE PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.16	.384
Al2O3	18.16	1.963
SiO2	65.42	6
K2O	13.54	1.584
CaO	.73	.072
TOTAL	101.49	10.003

CA: MG: FE = 100 0 0

CA: NA: K = 3.53 18.82 77.65

Sample=? CY28 FELDSPAR HYBRID PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.95	.348
Al2O3	18.54	2.007
SiO2	64.92	5.963
K2O	13.68	1.603
CaO	.88	.087
TOTAL	99.51	10.008

CA: MG: FE = 100 0 0

CA: NA: K = 4.27 17.08 78.66

Sample=? CY28 FELDSPAR HYBRID PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.95	.348
Al2O3	19.05	2.06
SiO2	64.41	5.909
K2O	13.36	1.564
CaO	.83	.081
TiO2	.42	.029
TOTAL	101.15	9.991

CA: MG: FE = 100 0 0

CA: NA: K = 4.06 17.46 78.47

Sample=? CY28 FELDSPAR HYBRID PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.93	.343
Al2O3	18.9	2.041
SiO2	64.63	5.923
K2O	13.3	1.555
CaO	.78	.077
TiO2	.47	.032
TOTAL	100.88	9.971

CA: MG: FE = 100 0 0

CA: NA: K = 3.9 17.37 78.73

Sample=? CY28 FELDSPAR HYBRID PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.01	.357
Al2O3	18.5	2
SiO2	65.16	5.976
K2O	13.54	1.584
CaO	.8	.078
TOTAL	102.13	9.995

CA: MG: FE = 100 0 0

CA: NA: K = 3.86 17.68 78.45

Sample=? CY28K-FELDSPAR HYBRID PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.62	.464
Al2O3	18.65	2.013
SiO2	65.05	5.958
K2O	12.9	1.508
CaO	.77	.076
TOTAL	102.36	10.019

CA: MG: FE = 100 0 0

CA: NA: K = 3.71 22.66 73.63

CY28, CY29

Sample=? CY28 FELDSPAR HYBRID PART

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	2.17	.387	
Al2O3	18.61	2.015	
SiO2	64.82	5.954	
K2O	13.61	1.595	
CaO	.79	.077	
TOTAL	102.6	10.028	

CA: MG: FE = 100 0 0

CA: NA: K = 3.74 18.8 77.46

Sample=? CY28 PYROXENE HYBRID PART

ELEM	OX	STRUCT	OXNO.=? -6
Na2O	1.54	.117	
MgO	7.18	.422	
Al2O3	5.03	.234	
SiO2	45.84	1.807	
CaO	21.49	.908	
TiO2	.85	.025	
MnO	.52	.017	
FeO	17.56	.579	
TOTAL	104.01	4.109	

MG/MG+FE= 42.16

CA: MG: FE = 47.56 22.11 30.33

CA: NA: K = 88.59 11.41 0

Sample=? CY28 REPEAT FIRST PYROXENE

ELEM	OX	STRUCT	OXNO.=? -6
Na2O	1.31	.099	
MgO	8.31	.483	
Al2O3	3.17	.146	
SiO2	48.35	1.887	
CaO	21.44	.896	
TiO2	.35	.01	
MnO	.57	.019	
FeO	16.51	.539	
TOTAL	98.5	4.079	

MG/MG+FE= 47.26

CA: MG: FE = 46.22 25.18 28.1

CA: NA: K = 90.05 9.95 0

Sample=? CY28 REPEAT SECOND PYROXENE

ELEM	OX	STRUCT	OXNO.=? -6
Na2O	2.05	.157	
MgO	6.98	.411	
Al2O3	3.16	.147	
SiO2	47.66	1.881	
CaO	20.58	.87	
TiO2	.5	.015	
MnO	.68	.023	
FeO	18.4	.607	
TOTAL	99.2	4.111	

MG/MG+FE= 40.37

CA: MG: FE = 46.08 21.77 32.15

CA: NA: K = 84.71 15.29 0

Sample=? CY28 K-FELDSPAR HYBRID PART

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	1.97	.351	
Al2O3	18.52	2.007	
SiO2	64.8	5.958	
K2O	13.9	1.631	
CaO	.81	.08	
TOTAL	97.62	10.027	

CA: MG: FE = 100 0 0

CA: NA: K = 3.88 17.02 79.1

Sample=? CY28 K-FELDSPAR HYBRID PART

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	1.89	.335	
Al2O3	18.95	2.048	
SiO2	64.69	5.93	
K2O	13.41	1.568	
CaO	.73	.071	
TiO2	.35	.024	
TOTAL	99.2	9.97599	

CA: MG: FE = 100 0 0

CA: NA: K = 3.6 16.97 79.43

Sample=? CY 29 AS ABOVE

ELEM	OX	STRUCT
Na2O	1.51	.27
Al2O3	18.18	1.971
SiO2	65.17	5.993
K2O	14.17	1.662
CaO	.92	.091
Total	100.45	9.9872

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.5 13.35 82.16

AFM Ratio = 100

Sample=? CY 29 AS ABOVE

ELEM	OX	STRUCT
Na2O	1.47	.263
Al2O3	18.07	1.965
SiO2	65.01	5.993
K2O	14.36	1.689
CaO	.91	.09
Total	99.54	10.0004

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.41 12.88 82.71

AFM Ratio = 100

Sample=? CY 29 AS ABOVE

ELEM	OX	STRUCT
Na2O	1.77	.319
Al2O3	18.44	2.003
SiO2	64.64	5.958
K2O	14.11	1.659
CaO	.91	.09
Total	101.68	10.0296

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.35 15.43 80.22

AFM Ratio = 100

Sample=? CY 29 AS ABOVE

ELEM	OX	STRUCT
Na2O	1.55	.276
Al2O3	18.24	1.979
SiO2	65	5.983
K2O	14.24	1.672
CaO	.94	.092
Total	97.77	10.0002

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.51 13.53 81.96

AFM Ratio = 100

Sample=? CY 29 AS ABOVE

ELEM	OX	STRUCT
Na2O	1.63	.291
Al2O3	18.39	1.995
SiO2	64.8	5.965
K2O	14.19	1.667
CaO	.99	.097
Total	100.37	10.016

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.72 14.14 81.12

AFM Ratio = 100

Sample=? CY 29 K FELDSPAR NEXT TO MG'S ETC

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	1.6	.286	
Al2O3	18.11	1.967	
SiO2	65	5.989	
K2O	14.22	1.672	
CaO	.95	.094	
Total	98.48	10.0072	

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.58 13.94 81.48

AFM Ratio = 100

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.46	1.247
Al2O3	34.21	1.927
SiO2	43.77	2.093
K2O	6.34	.387
CaO	1.63	.084
FeO	.56	.023
Total	99.18	5.7604

Mg/Mg+Fe= 0

Ca: Mg: Fe = 78.5 0 21.5

Ca: Na: K = 4.89 72.58 22.53

AFM Ratio = 97.87

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.01	1.204
Al2O3	34.61	1.959
SiO2	43.4	2.072
K2O	8.25	.38
CaO	2.18	.111
FeO	.32	.014
Total	97.4	5.7409

Ms/Ms+Fe= 0

Ca: Ms: Fe = 88.8 0 11.2

Ca: Na: K = 6.55 71.03 22.42

AFM Ratio = 98.59

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.25	1.225
Al2O3	34.71	1.952
SiO2	43.59	2.077
K2O	6.15	.374
CaO	1.95	.1
FeO	.36	.014
Total	99.3	5.7443

Ms/Ms+Fe= 0

Ca: Ms: Fe = 87.72 0 12.28

Ca: Na: K = 5.89 72.1 22.01

AFM Ratio = 98.59

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.63	1.262
Al2O3	34.56	1.946
SiO2	43.54	2.08
K2O	6.24	.38
CaO	1.66	.085
FeO	.37	.015
Total	99.39	5.7684

Ms/Ms+Fe= 0

Ca: Ms: Fe = 85 0 15

Ca: Na: K = 4.92 73.07 22

AFM Ratio = 98.48

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.05	1.206
Al2O3	34.89	1.96
SiO2	43.76	2.085
K2O	6.33	.385
CaO	1.5	.077
FeO	.47	.019
Total	99.48	5.7304

Ms/Ms+Fe= 0

Ca: Ms: Fe = 80.21 0 19.79

Ca: Na: K = 4.68 72.3 23.00

AFM Ratio = 98.1

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.39	1.24
Al2O3	34.61	1.949
SiO2	43.56	2.081
K2O	6.44	.393
CaO	1.65	.084
FeO	.35	.014
Total	98.14	5.7611

Ms/Ms+Fe= 0

Ca: Ms: Fe = 85.71 0 14.29

Ca: Na: K = 4.89 72.22 22.89

AFM Ratio = 98.58

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.67	1.268
Al2O3	34.32	1.936
SiO2	43.51	2.082
K2O	6.32	.386
CaO	1.69	.086
FeO	.49	.02
Total	99.20	5.7772

Ms/Ms+Fe= 0

Ca: Ms: Fe = 81.13 0 18.87

Ca: Na: K = 4.94 72.87 22.18

AFM Ratio = 97.98

Sample=? CY29 ANOTHER

ELEM	OX	STRUCT
Na2O	13.43	1.239
Al2O3	34.29	1.932
SiO2	44.54	2.118
K2O	5.91	.359
CaO	1.64	.084
Total	97.39	5.7197

Ca: Ms: Fe = 100 0 0

Ca: Na: K = 5 73.45 21.36

AFM Ratio = 100

Sample=? CY29 NEPHELINE

ELEM	OX	STRUCT
Na2O	13.56	1.252
Al2O3	34.1	1.914
SiO2	44.31	2.11
K2O	6.03	.367
CaO	1.74	.089
FeO	.26	.01
Total	99.03	5.7421

No such option!

Ca: Ms: Fe = 89.9 0 10.1

Ca: Na: K = 5.21 73.3 21.49

AFM Ratio = 98.97

Sample=? CY29 NEPHELINE

ELEM	OX	STRUCT
Na2O	13.62	1.261
Al2O3	34.56	1.946
SiO2	43.55	2.081
K2O	6.25	.381
CaO	1.6	.082
FeO	.42	.017
Total	99.95	5.7674

No such option!

Ca: Ms: Fe = 82.83 0 17.17

Ca: Na: K = 4.76 73.14 22.1

AFM Ratio = 98.28

Sample=? CY29 NEPHELINE

ELEM	OX	STRUCT
Na2O	13.56	1.257
Al2O3	34.29	1.933
SiO2	43.69	2.69
K2O	6.55	.4
CaO	1.48	.076
FeO	.43	.017
Total	99.13	5.7723

No such option!

Ca: Ms: Fe = 81.72 0 18.28

Ca: Na: K = 4.39 72.53 23.08

AFM Ratio = 98.07

Sample=? CY29 NEPHELINE

ELEM	OX	STRUCT
Na2O	13.63	1.259
Al2O3	34.16	1.919
SiO2	44.23	2.107
K2O	6.15	.374
CaO	1.61	.082
FeO	.21	.008
Total	98.78	5.7499

No such option!

Ca: Ms: Fe = 91.11 0 8.89

Ca: Na: K = 4.78 73.41 21.81

AFM Ratio = 99.17

Sample=? CY29 NEPHELINE

ELEM	OX	STRUCT
Na2O	13.71	1.27
Al2O3	34.43	1.939
SiO2	43.62	2.084
K2O	6.22	.379
CaO	1.61	.082
FeO	.41	.016
Total	100.46	5.7709

No such option!

Ca: Ms: Fe = 83.67 0 16.33

Ca: Na: K = 4.74 73.37 21.89

AFM Ratio = 98.38

Sample=? CY29 NEPHELINE OXNO.=? -8

ELEM	OX	STRUCT
Na20	13.69	1.271
Al203	34.33	1.938
Si02	43.43	2.079
K20	6.18	.377
CaO	1.57	.082
FeO	.72	.029
Total	99.57	5.7755

Mg/Mg+Fe= 0

Ca: Mg: Fe = 73.67 0 26.33

Ca: Na: K = 4.74 73.47 21.79

AFM Ratio = 97.09

Sample=? CY29 ANOTHER NEPHELINE

ELEM	OX	STRUCT
Na20	13.6	1.278
Al203	34.18	1.923
Si02	43.95	2.098
K20	6.22	.379
CaO	1.56	.08
FeO	.29	.012
Total	104.65	5.7689

No such option!

Ca: Mg: Fe = 86.96 0 13.04

Ca: Na: K = 4.61 73.58 21.82

AFM Ratio = 98.77

Sample=? CY29 ANOTHER NEPHELINE

ELEM	OX	STRUCT
Na20	13.51	1.249
Al203	34.32	1.929
Si02	44	2.098
K20	6.15	.374
CaO	1.74	.089
FeO	.27	.011
Total	104.22	5.7493

No such option!

Ca: Mg: Fe = 89 0 11

Ca: Na: K = 5.2 72.96 21.85

AFM Ratio = 98.87

Sample=? CY29 ANOTHER NEPHELINE

ELEM	OX	STRUCT
Na20	13.54	1.25
Al203	34.23	1.922
Si02	44.19	2.105
K20	6.02	.365
CaO	1.68	.086
FeO	.34	.014
Total	104.17	5.7423

Mg/Mg+Fe= 0

Ca: Mg: Fe = 86 0 14

Ca: Na: K = 5.05 73.44 21.5

AFM Ratio = 98.56

Sample=? CY29 NEPHELINE

ELEM	OX	STRUCT
Na20	13.8	1.282
Al203	34.45	1.945
Si02	43.31	2.075
K20	6.47	.395
CaO	1.43	.073
FeO	.51	.02
Total	97.46	5.7909

Mg/Mg+Fe= 0

Ca: Mg: Fe = 78.49 0 21.51

Ca: Na: K = 4.17 73.26 22.57

AFM Ratio = 97.98

Sample=? CY29 ANOTHER NEPHILENE

ELEM	OX	STRUCT
Na20	13.76	1.275
Al203	34.43	1.939
Si02	43.56	2.082
K20	6.26	.382
CaO	1.78	.091
FeO	.2	.008
Total	99.13	5.777

Mg/Mg+Fe= 0

Ca: Mg: Fe = 91.92 0 8.08

Ca: Na: K = 5.21 72.94 21.85

AFM Ratio = 99.18

Sample=? CY29 ANOTHER K-FELDSPAR

ELEM	OX	STRUCT
Na20	1.8	.322
Al203	18.23	1.979
Si02	64.86	5.977
K20	14.25	1.675
CaO	.8	.079
Total	100.67	10.0318

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.81 15.51 80.68

AFM Ratio = 100

Trace Elements? 9

Sample=? CY29 K-FELDSPAR

ELEM	OX	STRUCT
Na20	1.72	.307
Al203	18.01	1.959
Si02	64.86	5.987
K20	14.27	1.681
CaO	.93	.092
Total	98.27	10.0271

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.42 14.76 80.82

AFM Ratio = 100

Sample=? CY29

ELEM	OX	STRUCT
Na20	13.35	1.232
Al203	34.59	1.94
Si02	43.96	2.092
K20	5.83	.354
CaO	2.01	.102
FeO	.27	.011
Total	99.38	5.731

Mg/Mg+Fe= 0

Ca: Mg: Fe = 90.27 0 9.73

Ca: Na: K = 6.04 72.99 20.97

AFM Ratio = 98.88

Sample=? CY29 NEPHELINE ANOTHER

ELEM	OX	STRUCT
Na20	13.44	1.241
Al203	34.3	1.924
Si02	44.24	2.106
K20	6	.364
CaO	1.75	.089
FeO	.28	.011
Total	100.45	5.7347

ZONE NEXT TO ABOVE

Mg/Mg+Fe= 0

Ca: Mg: Fe = 89 0 11

Ca: Na: K = 5.25 73.26 21.49

AFM Ratio = 98.87

Sample=? CY29 ANOTHER ZONE\?

ELEM	OX	STRUCT
Na20	13.4	1.233
Al203	33.98	1.902
Si02	44.06	2.13
K20	5.86	.355
CaO	1.66	.085
FeO	.23	.009
Total	98.95	5.7138

Mg/Mg+Fe= 0

Ca: Mg: Fe = 90.43 0 9.57

Ca: Na: K = 5.08 73.7 21.22

AFM Ratio = 99.06

Sample=? CY29 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na20	1.68	.3
Al203	18.89	2.05
Si02	62.78	5.78
K20	13.16	1.545
CaO	.68	.067
TiO2	2.57	.178
FeO	.25	.019
Total	101.03	9.9397

Mg/Mg+Fe= 0

Ca: Mg: Fe = 77.91 0 22.09

Ca: Na: K = 3.5 15.69 80.81

AFM Ratio = 98.18

Sample=? CY29 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.78	.319
Al2O3	18.6	2.012
SiO2	64.76	5.944
K2O	13.58	1.59
CaO	.81	.08
TiO2	.43	.029
Total	103.66	9.974

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.02 16 79.98
AFM Ratio = 100

Sample=? SAME OXNO.=? -8

ELEM	OX	STRUCT
Na2O	13.32	1.261
Al2O3	34.44	1.937
SiO2	43.86	2.093
K2O	6.39	.389
CaO	1.42	.073
FeO	.26	.01
Total	98.83	5.7632
Mg/Mg+Fe=		0

Ca: Mg: Fe = 87.95 0 12.05
Ca: Na: K = 4.24 73.19 22.58
AFM Ratio = 98.98

Sample=? CY29 K-FELDSPAR ABOUT ABOVE

ELEM	OX	STRUCT
Na2O	1.93	.344
Al2O3	18.39	1.996
SiO2	64.64	5.952
K2O	13.88	1.631
CaO	1.15	.114
Total	102.44	10.0373

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.46 16.47 78.08
AFM Ratio = 100

Sample=? CY29 PYROXENE IN NEPHELINE OXNO.=? -8

ELEM	OX	STRUCT
Na2O	3.14	.238
MgO	7.76	.451
Al2O3	1.22	.056
SiO2	51.08	1.994
CaO	17.81	.745
MnO	.59	.019
FeO	18.18	.594
Total	101.6	4.0969
Mg/Mg+Fe=		43.16

Ca: Mg: Fe = 41.62 25.2 33.18
Ca: Na: K = 75.79 24.21 0
AFM Ratio = 2.61

Sample=? CY29 NEPHELINE ANOTHER PART

ELEM	OX	STRUCT
Na2O	13.68	1.262
Al2O3	34	1.907
SiO2	44.51	2.118
K2O	5.75	.349
CaO	1.59	.081
FeO	.39	.016
Total	104.05	5.734
Mg/Mg+Fe=		0

Ca: Mg: Fe = 83.51 0 16.49
Ca: Na: K = 4.79 74.59 20.63
AFM Ratio = 98.35

Sample=? CY29 MATIRIAL; ABOUT ABOVE K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.64	.293
Al2O3	18.38	1.993
SiO2	64.53	5.937
K2O	14.02	1.645
CaO	.75	.073
TiO2	.68	.047
Total	104.87	9.9886

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.63 14.57 81.8
AFM Ratio = 100

Sample=? CY29AGAIN

ELEM	OX	STRUCT
Na2O	13.29	1.225
Al2O3	33.78	1.893
SiO2	44.79	2.13
K2O	6	.364
CaO	1.89	.096
FeO	.45	.01
Total	100.85	5.7184
Mg/Mg+Fe=		0

Ca: Mg: Fe = 90.57 0 9.43
Ca: Na: K = 5.7 72.7 21.6
AFM Ratio = 98.95

Sample=? CY29 MAGNETITE OXNO.=? -4

ELEM	OX	STRUCT
MgO	.8	.055
Al2O3	1.23	.068
TiO2	.47	.016
Cr2O3	.28	.01
MnO	.97	.038
FeO	96.25	3.757
TOTAL	95.85	3.944
MG/MG+FE=		1.44

CA: MG: FE = 0 1.44 98.56

Sample=? CY29 BIOTITE AGAINST ABOVE OXNO.=? -11

ELEM	OX	STRUCT
MgO	14.71	1.6
Al2O3	14.04	1.207
SiO2	38.31	2.795
K2O	10.46	.973
CaO	.67	.053
TiO2	2.62	.144
MnO	.61	.038
FeO	18.59	1.134
TOTAL	96.83	7.944

CA: MG: FE = 1.9 57.41 40.69
CA: NA: K = 5.17 0 94.83

Sample=? CY29 SANIDINE AGAINST ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.62	.29
Al2O3	19.05	2.075
SiO2	61.84	5.715
K2O	12.99	1.531
CaO	.97	.096
TiO2	2.89	.201
FeO	.63	.049
TOTAL	97.02	9.95699
MG/MG+FE=		0

CA: MG: FE = 66.21 0 33.79
CA: NA: K = 5.01 15.13 79.86

Sample=? CY29 ANOTHER MAGNETITE OXNO.=? -4

ELEM	OX	STRUCT
Al2O3	.64	.036
TiO2	1	.035
MnO	1.23	.049
FeO	97.13	3.827
TOTAL	86.16	3.947

Sample=? CY29 BIOTITE AGAINST ABOVE OXNO.=? -11

ELEM	OX	STRUCT
MgO	14.19	1.547
Al2O3	13.94	1.202
SiO2	38.01	2.779
K2O	10.2	.952
CaO	.71	.056
TiO2	3.25	.179
MnO	.58	.036
FeO	19.1	1.168
TOTAL	94.89	7.919
MG/MG+FE=		56.98

CA: MG: FE = 2.02 55.83 42.15
CA: NA: K = 5.56 0 94.44

Sample=? CY29 SANIDINE AGAINST ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.52	.273
Al2O3	18.14	1.973
SiO2	64.67	5.968
K2O	14.29	1.682
CaO	1.01	.1
FeO	.39	.03
TOTAL	98.17	10.026
MG/MG+FE=		0

CY26, CY30A

Sample=? CY26 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.42	.948
Al2O3	18.93	2.013
SiO2	66.17	5.968
K2O	8.79	1.012
CaO	.7	.066
TOTAL	99.03	10.009

CA: MG: FE = 100 0 0

CA: NA: K = 3.35 46.75 49.9

Sample=? CY26 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.76	1.005
Al2O3	19.05	2.022
SiO2	66.12	5.955
K2O	8.25	.948
CaO	.83	.08
TOTAL	99.35	10.01

CA: MG: FE = 100 0 0

CA: NA: K = 3.94 49.43 46.63

Sample=? CY26 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	4.04	1.216
MgO	7.69	1.778
Al2O3	11.11	2.031
SiO2	39.81	6.173
K2O	1.76	.348
CaO	10.05	1.669
TiO2	.63	.074
MnO	1.18	.154
FeO	23.72	3.076
TOTAL	100.15	16.519

MG/MG+FE= 36.63

CA: MG: FE = 25.59 27.26 47.16

CA: NA: K = 51.62 37.61 10.76

Sample=? CY26 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.2	.215
Al2O3	18.22	1.963
SiO2	64.67	5.973
K2O	15.03	1.771
CaO	.88	.087
TOTAL	97.65	10.029

CA: MG: FE = 100 0 0

CA: NA: K = 4.2 10.37 85.43

Sample=? CY26 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.73	1.668
Al2O3	19.39	2.019
SiO2	67.51	5.966
K2O	2.96	.334
CaO	.41	.038
TOTAL	98.07	10.025

CA: MG: FE = 100 0 0

CA: NA: K = 1.86 81.76 16.37

Sample=? CY26MELANITE OXNO.=? -24

ELEM	OX	STRUCT
MgO	.51	.134
Al2O3	3.4	.499
SiO2	35.17	6.129
CaO	31.33	5.85
TiO2	3.27	.429
Cr2O3	.25	.034
MnO	1.23	.181
FeO	24.84	3.621
TOTAL	99.8	17.077

MG/MG+FE= 3.57

CA: MG: FE = 60.91 1.4 37.7

CA: NA: K = 100 0 0

Sample=? CY30A K-FELDSPAR OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.78	.119
Al2O3	18.59	.757
SiO2	64.6	2.231
K2O	14.29	.63
CaO	.74	.027
TOTAL	99.42	3.764

CA: MG: FE = 100 0 0

CA: NA: K = 3.48 15.34 81.19

Sample=? CY30A PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	13.18	1.044
MgO	1.29	.079
Al2O3	.4	.019
SiO2	51.11	2.087
CaO	3.95	.155
MnO	.76	.026
FeO	29.68	1.014
TOTAL	103.99	4.424

MG/MG+FE= 7.23

CA: MG: FE = 12.42 6.33 81.25

CA: NA: K = 12.93 87.07 0

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	17.71	1.924
SiO2	65.63	6.051
K2O	15.85	1.865
CaO	.81	.08
TOTAL	99.12	9.92

CA: MG: FE = 100 0 0

CA: NA: K = 4.11 0 95.89

Sample=? CY30A ANOTHER K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.76	.492
Al2O3	18.86	2.039
SiO2	64.41	5.91
K2O	12.85	1.505
CaO	.78	.077
TiO2	.33	.023
TOTAL	100.97	10.046

CA: MG: FE = 100 0 0

CA: NA: K = 3.71 23.72 72.57

Sample=? CY30A MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Na2O	5.85	1.833
MgO	3.68	.887
SiO2	50.25	8.12
CaO	13.66	2.365
MnO	1.68	.23
FeO	24.89	3.364
TOTAL	100.39	16.799

MG/MG+FE= 20.87
CA: MG: FE = 35.75 13.41 50.85
CA: NA: K = 56.34 43.66 0

Sample=? CY30A PYROXENE ANOTHER GRAIN OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.76	.766
Al2O3	1.72	.076
SiO2	52.15	1.947
CaO	23.39	.936
TiO2	.48	.014
MnO	.32	.01
FeO	8.19	.256
TOTAL	98.1	4.005

MG/MG+FE= 74.95
CA: MG: FE = 47.8 39.12 13.07
CA: NA: K = 100 0 0

Sample=? CY30A ANOTHER PYROXENE

ELEM	OX	STRUCT
MgO	15.04	.834
Al2O3	1.4	.061
SiO2	52.2	1.941
CaO	23.67	.943
TiO2	.43	.012
FeO	7.28	.226
TOTAL	97.22	4.017

MG/MG+FE= 78.68
CA: MG: FE = 47.08 41.64 11.28
CA: NA: K = 100 0 0

Sample=? CY30A PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.78	.917
Al2O3	.94	.041
SiO2	53.42	1.958
CaO	24.51	.963
TiO2	.25	.007
Cr2O3	.32	.009
FeO	3.76	.115
TOTAL	98.21	4.01

MG/MG+FE= 88.86
CA: MG: FE = 48.27 45.96 5.76
CA: NA: K = 100 0 0

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.98	.527
Al2O3	18.97	2.042
SiO2	65.12	5.945
K2O	12.18	1.419
CaO	.77	.075
TOTAL	100.85	10.008

CA: MG: FE = 100 0 0
CA: NA: K = 3.71 26.08 70.21

Sample=? CY30A FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.47	.437
Al2O3	18.93	2.041
SiO2	65.01	5.946
K2O	12.72	1.484
CaO	.85	.084
TOTAL	99.66	9.992

CA: MG: FE = 100 0 0
CA: NA: K = 4.19 21.8 74.01

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.59	.459
Al2O3	18.74	2.02
SiO2	65.18	5.961
K2O	12.68	1.48
CaO	.8	.078
TOTAL	97.62	9.998

CA: MG: FE = 100 0 0
CA: NA: K = 3.87 22.76 73.38

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.02	.535
Al2O3	18.84	2.027
SiO2	65.2	5.953
K2O	12.13	1.413
CaO	.8	.078
TOTAL	97.1	10.006

CA: MG: FE = 100 0 0
CA: NA: K = 3.85 26.41 69.74

Sample=? CY30A K-FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.23	.22
Al2O3	17.72	1.929
SiO2	65.12	6.013
K2O	15.11	1.78
CaO	.83	.082
TOTAL	102.12	10.024

CA: MG: FE = 100 0 0
CA: NA: K = 3.94 10.57 85.49

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.29	.584
Al2O3	18.97	2.046
SiO2	64.3	5.883
K2O	11.94	1.393
CaO	.77	.075
TiO2	.72	.049
TOTAL	101.5	10.03

CA: MG: FE = 100 0 0
CA: NA: K = 3.65 28.46 67.88

Sample=? CY30A INC. IN SPHENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.47	.034
MgO	13.48	.755
Al2O3	1.21	.054
SiO2	51.94	1.952
CaO	23.41	.942
Cr2O3	.23	.007
MnO	.35	.011
FeO	8.9	.28
TOTAL	103.48	4.035

MG/MG+FE= 72.95
CA: MG: FE = 47.65 38.19 14.16
CA: NA: K = 96.52 3.48 0

Sample=? CY30A K-FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.38	.599
Al2O3	19.1	2.055
SiO2	64.82	5.915
K2O	11.7	1.362
CaO	.71	.07
TiO2	.28	.019
TOTAL	102.99	10.02

CA: MG: FE = 100 0 0
CA: NA: K = 3.45 29.49 67.06

Sample=? CY30A PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	14.28	.796
Al2O3	1.68	.074
SiO2	51.58	1.928
CaO	23.53	.943
TiO2	.6	.017
FeO	8.34	.261
TOTAL	99.57	4.019

MG/MG+FE= 75.31
CA: MG: FE = 47.15 39.8 13.05
CA: NA: K = 100 0 0

Sample=? CY30A ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.78	.058
MgO	11.57	.656
Al2O3	3.27	.146
SiO2	49.61	1.886
CaO	22.39	.912
TiO2	.65	.019
MnO	.4	.013
FeO	11.31	.36
TOTAL	100.73	4.05

MG/MG+FE= 64.57
CA: MG: FE = 47.3 34.02 18.67
CA: NA: K = 94.02 5.98 0

Sample=? CY30A HYBRID PART OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.07	.73
Al2O3	2.74	.121
SiO2	50.93	1.909
CaO	23.24	.933
TiO2	.88	.025
FeO	9.13	.286
TOTAL	100.26	4.004

MG/MG+FE= 71.85

CA: MG: FE = 47.87 37.46 14.67

CA: NA: K = 100 0 0

Sample=? CY30A HYBRID PART AMPHIBOLE IN CONTACT WITH ABOVE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	3.01	.887
MgO	9.8	2.224
Al2O3	12.19	2.187
SiO2	39.85	6.068
K2O	2.11	.409
CaO	11.03	1.799
TiO2	1.08	.124
MnO	.58	.075
FeO	20.36	2.593
TOTAL	98.91	16.366

MG/MG+FE= 46.17

CA: MG: FE = 27.19 33.62 39.19

CA: NA: K = 58.13 28.66 13.21

Sample=? CY30A PYROXENE HYBRID PART OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.4	.748
Al2O3	2.82	.124
SiO2	50.78	1.902
CaO	23.42	.94
TiO2	.8	.023
FeO	8.76	.274
TOTAL	99.01	4.011

MG/MG+FE= 73.19

CA: MG: FE = 47.91 38.12 13.97

CA: NA: K = 100 0 0

Sample=? CY30A HYBRID PART PYROXENE OXNO.=? -11

ELEM	OX	STRUCT
Na2O	.62	.046
MgO	11.56	.655
Al2O3	3.14	.141
SiO2	49.61	1.886
CaO	22.93	.934
TiO2	.75	.021
MnO	.4	.013
FeO	11	.35
TOTAL	98.82	4.046

MG/MG+FE= 65.17

CA: MG: FE = 48.17 33.78 18.05

CA: NA: K = 95.31 4.69 0

Sample=? CY30A BIOTITE OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.37	1.715
Al2O3	14.1	1.168
SiO2	43.38	3.05
K2O	9.25	.83
CaO	.45	.034
TiO2	.35	.019
MnO	.48	.028
FeO	15.62	.918
TOTAL	89.66	7.762

MG/MG+FE= 65.13

CA: MG: FE = 1.27 64.3 34.42

CA: NA: K = 3.94 0 96.06

Sample=? CY30A ANOTHER PYROXENE HYBRID PART OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.01	.83
Al2O3	1.4	.061
SiO2	52.45	1.947
CaO	23.72	.943
TiO2	.4	.011
FeO	7	.217
TOTAL	100.65	4.009

MG/MG+FE= 79.27

CA: MG: FE = 47.39 41.71 10.9

CA: NA: K = 100 0 0

Sample=? CY30A BIOTITE HYBRID PART OXNO.=? -11

ELEM	OX	STRUCT
MgO	18.49	1.967
Al2O3	13.93	1.171
SiO2	40.09	2.861
K2O	10.26	.934
CaO	.5	.039
TiO2	1.05	.056
MnO	.3	.018
FeO	15.37	.918
TOTAL	94.93	7.964

MG/MG+FE= 68.18

CA: MG: FE = 1.33 67.27 31.4

CA: NA: K = 4.01 0 95.99

Sample=? FELDSPAR -K OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.4	.426
Al2O3	18.76	2.026
SiO2	64.97	5.952
K2O	13.07	1.528
CaO	.8	.078
TOTAL	101.68	10.01

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.13	.203
Al2O3	17.86	1.942
SiO2	65.1	6.007
K2O	15.05	1.77
CaO	.88	.087
TOTAL	101.5	10.009

CA: MG: FE = 100 0 0

CA: NA: K = 4.22 9.85 85.92

Sample=? CY30A NA-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.88	2.015
Al2O3	19.12	1.973
SiO2	68.65	6.008
K2O	.37	.042
TOTAL	102.44	10.038

CA: MG: FE = 2.14748E+7

CA: NA: K = 0 97.96 2.04

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.24	1.425
Al2O3	18.74	1.971
SiO2	67.19	5.994
K2O	5.53	.629
CaO	.31	.029
TOTAL	99.9	10.048

CA: MG: FE = 100 0 0

CA: NA: K = 1.39 68.41 30.2

Sample=? CY30A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.91	1.526
Al2O3	19.16	1.995
SiO2	68.07	6.013
K2O	3.85	.434
TOTAL	100.3	9.968

CA: MG: FE = 2.14748E+7

CA: NA: K = 0 77.86 22.14

Sample=? CY30A MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Na2O	6.78	2.148
MgO	1.87	.456
Al2O3	.42	.08
SiO2	49.8	8.135
CaO	11.94	2.089
MnO	1.25	.173
FeO	27.93	3.816
TOTAL	102.77	16.897

MG/MG+FE= 10.67

CA: MG: FE = 32.84 7.17 59.99

CA: NA: K = 49.3 50.7 0

[illegible]

Sample=? CY30C2 K- FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.84	.502
Al2O3	19.58	2.098
SiO2	64.22	5.84
K2O	11.03	1.26
CaO	.94	.091
TiO2	1.4	.096
TOTAL	99.73	9.907

CA: NA: K = 4.86 26.8 68.34

[illegible]

Sample=? CY30C2 PYX OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.07	.833
Al2O3	2.8	.122
SiO2	51.34	1.902
CaO	23.73	.942
TiO2	.77	.021
FeO	6.3	.195
TOTAL	102.89	4.015

MG/MG+FE= 81.03

CA: MG: FE = 47.82 42.28 9.9

CA: NA: K = 100 0 0

[illegible]

Sample=? CY30C2 FELDSPAR OXNO.=? -16

[illegible]

Sample=? CY30C2 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.33	.895
Al2O3	1.45	.063
SiO2	52.95	1.946
CaO	24.56	.967
TiO2	.27	.007
FeO	4.46	.137
TOTAL	102.4	4.015

MG/MG+FE= 86.72

CA: MG: FE = 48.37 44.77 6.85

CA: NA: K = 100 0 0

Sample=? CY30C2 PYX. OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.45	.898
Al2O3	1.11	.048
SiO2	53.61	1.963
CaO	24.58	.965
TiO2	.33	.009
FeO	3.91	.12
TOTAL	103.44	4.003

MG/MG+FE= 88.21

CA: MG: FE = 48.66 45.28 6.05

CA: NA: K = 100 0 0

Sample=? CY30C2 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.47	.436
Al2O3	18.57	1.998
SiO2	65.44	5.972
K2O	12.36	1.439
CaO	.94	.092
TiO2	.25	.017
TOTAL	101.88	9.95399

CA: MG: FE = 100 0 0

CA: NA: K = 4.68 22.17 73.16

Sample=? CY30C2 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.87	.507
Al2O3	19.1	2.05
SiO2	64.99	5.917
K2O	11.54	1.34
CaO	.98	.096
TiO2	.52	.035
TOTAL	101.6	9.945

CA: NA: K = 4.94 26.09 68.97

Sample=? CY31 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.97	.224
MgO	7.45	.466
Al2O3	1.1	.051
SiO2	50.01	1.964
CaO	19.66	.827
MnO	1.16	.039
FeO	17.66	.58
TOTAL	101.64	4.123

MG/MG+FE= 42.91

CA: MG: FE = 44.87 23.66 31.47

CA: NA: K = 78.54 21.46 0

Sample=? CY31 ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.93	.146
MgO	7.93	.462
Al2O3	2.68	.134
SiO2	48.58	1.901
CaO	20.67	.866
TiO2	.53	.016
MnO	.89	.03
FeO	16.79	.549
TOTAL	103.14	4.094

MG/MG+FE= 45.7

CA: MG: FE = 46.14 24.61 29.25

CA: NA: K = 85.57 14.43 0

Sample=? CY31 ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.51	.112
MgO	10.98	.626
Al2O3	1.3	.059
SiO2	51.17	1.956
CaO	21.98	.9
MnO	.81	.026
FeO	12.23	.391
TOTAL	103.49	4.07

MG/MG+FE= 61.55

CA: MG: FE = 46.95 32.66 20.4

CA: NA: K = 88.93 11.07 0

Sample=? CY31 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.16	.086
MgO	11.18	.637
Al2O3	1.13	.051
SiO2	51.23	1.958
CaO	22.26	.911
MnO	.83	.027
FeO	12.2	.39
TOTAL	100.19	4.06

MG/MG+FE= 62.03

CA: MG: FE = 47.01 32.87 20.12

CA: NA: K = 91.37 8.63 0

Sample=? CY31 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.72	.484
Al2O3	18.32	1.967
SiO2	65.37	5.99
K2O	13.02	1.522
CaO	.66	.065
TOTAL	98.61	10.028

CA: MG: FE = 100 0 0

CA: NA: K = 3.14 23.87 73.49

Sample=? CY31 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	18.18	1.985
SiO2	64.58	5.983
K2O	16.32	1.929
CaO	.92	.092
TOTAL	98.01	9.989

CA: MG: FE = 100 0 0

CA: NA: K = 4.55 0 95.45

Sample=? CY31 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.62	.465
Al2O3	18.39	2.011
SiO2	64.88	5.953
K2O	13.13	1.537
CaO	.78	.077
TOTAL	100.05	10.043

CA: MG: FE = 100 0 0

CA: NA: K = 3.7 22.37 73.93

Sample=? CY31 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.64	.47
Al2O3	18.12	1.96
SiO2	65.27	5.989
K2O	13.25	1.551
CaO	.71	.07
TOTAL	97.91	10.04

CA: MG: FE = 100 0 0

CA: NA: K = 3.35 22.48 74.18

Sample=? CY31 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.55	.195
MgO	6.18	.364
Al2O3	.93	.043
SiO2	50.27	1.985
CaO	19.32	.818
MnO	1.12	.038
FeO	19.61	.642
TOTAL	100.88	4.09

MG/MG+FE= 36

CA: MG: FE = 44.72 19.9 35.37

CA: NA: K = 80.75 19.25 0

Sample=? CY31 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.25	.224
Al2O3	18.29	1.986
SiO2	64.92	5.981
K2O	14.66	1.723
CaO	.87	.086
TOTAL	99.06	10

CA: MG: FE = 100 0 0

CA: NA: K = 4.23 11.02 84.75

Sample=? CY31 ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.86	.22
MgO	5.92	.35
Al2O3	.91	.042
SiO2	49.91	1.979
CaO	19.03	.809
MnO	1.14	.038
FeO	20.22	.671
TOTAL	100.13	4.109

MG/MG+FE= 34.28

CA: MG: FE = 44.21 19.13 36.67

CA: NA: K = 78.62 21.38 0

Sample=? CY32K-FELDSPAR ENCLOSING QUARTZ GRAIN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.11	.198
Al2O3	18.16	1.976
SiO2	64.77	5.981
K2O	15.09	1.778
CaO	.87	.086
TOTAL	102.38	10.019

CA: MG: FE = 100 0 0

CA: NA: K = 4.17 9.6 86.23

Sample=? CY32 ANOTHER FELDSPAR

ELEM	OX	STRUCT
Na2O	4.79	.84
Al2O3	18.8	2.007
SiO2	65.91	5.969
K2O	9.89	1.143
CaO	.6	.058
TOTAL	102.57	10.017

CA: MG: FE = 100 0 0

CA: NA: K = 2.84 41.16 56

Sample=? CY32 K-FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.9	.687
Al2O3	18.63	1.997
SiO2	65.67	5.974
K2O	11.09	1.287
CaO	.7	.068
TOTAL	101.84	10.013

CA: MG: FE = 100 0 0

CA: NA: K = 3.33 33.64 63.03

Sample=? CY32 MINERAL??? OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.57	.038
Al2O3	39.49	1.632
SiO2	45.29	1.588
K2O	11.3	.505
CaO	.69	.026
FeO	2.69	.079
TOTAL	92.42	3.868
MG/MG+FE=		0

CA: MG: FE = 24.76 0 75.24

CA: NA: K = 4.57 6.68 88.75

Sample=? CY32 MELANITE OXNO.=? -24

ELEM	OX	STRUCT
MgO	.48	.127
Al2O3	2	.418
SiO2	34.7	6.137
CaO	31.85	6.035
TiO2	3	.399
MnO	1.12	.168
FeO	26.86	3.973
TOTAL	100.22	17.257
MG/MG+FE=		3.1

CA: MG: FE = 59.55 1.25 39.2

CA: NA: K = 100 0 0

Sample=? CY32K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.05	.54
Al2O3	18.74	2.021
SiO2	65.07	5.951
K2O	12.38	1.445
CaO	.76	.074
TOTAL	102.28	10.031

CA: MG: FE = 100 0 0

CA: NA: K = 3.59 26.23 70.18

Sample=? CY32 MELANITE OXNO.=? -16

ELEM	OX	STRUCT
MgO	.56	.099
Al2O3	1.95	.27
SiO2	34.89	4.1
CaO	31.61	3.98
TiO2	3.25	.287
Cr2O3	.31	.029
MnO	1.07	.107
FeO	26.35	2.589
TOTAL	100.73	11.461
MG/MG+FE=		3.68

CA: MG: FE = 59.69 1.48 38.83

CA: NA: K = 100 0 0

Sample=? CY32 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.6	.287
Al2O3	18.27	1.985
SiO2	64.84	5.975
K2O	14.49	1.704
CaO	.8	.079
TOTAL	102.2	10.03

CA: MG: FE = 100 0 0

CA: NA: K = 3.82 13.86 82.32

Sample=? CY32 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.21	.217
Al2O3	18.52	2.011
SiO2	64.69	5.961
K2O	14.68	1.726
CaO	.88	.087
TOTAL	100.87	10.002

CA: MG: FE = 100 0 0

CA: NA: K = 4.29 10.69 85.02

Sample=? CY32 PLAGIOCLASE OXNO.=? -8

ELEM	OX	STRUCT
Na2O	10.14	1.732
Al2O3	21.14	2.197
SiO2	65.82	5.802
K2O	.84	.094
CaO	1.74	.164
FeO	.31	.023
TOTAL	98.32	10.014
MG/MG+FE=		0

CA: MG: FE = 87.7 0 12.3

CA: NA: K = 8.23 86.95 4.82

Sample=? CY32 PLAGIOCLASE NEXT TO ABOVE OXNO.=? -8

ELEM	OX	STRUCT
Na2O	9.65	1.657
Al2O3	22.03	2.299
SiO2	64.54	5.713
K2O	1.36	.154
CaO	2	.19
FeO	.41	.03
TOTAL	97.93	10.043
MG/MG+FE=		0

CA: MG: FE = 86.36 0 13.64

CA: NA: K = 9.5 82.81 7.7

Sample=? CY32 BIOTITE NEXT TO ABOVE OXNO.=? -13

ELEM	OX	STRUCT
MgO	17.96	1.904
Al2O3	13.64	1.143
SiO2	41.09	2.922
K2O	9.85	.894
CaO	.53	.041
TiO2	.88	.047
MnO	.72	.055
FeO	15.1	.898
TOTAL	96.26	7.904
MG/MG+FE=		67.95

CA: MG: FE = 1.44 66.97 31.59

CA: NA: K = 4.39 0 95.61

Sample=? CY32 K-FELDSPAR NEXT TO ABOVE PLAGIOCLASE

ELEM	OX	STRUCT
Na2O	3.44	.607
Al2O3	12.08	2.05
SiO2	65.14	5.936
K2O	11.56	1.345
CaO	.77	.075
TOTAL	100.21	10.013

CA: MG: FE = 100 0 0

CA: NA: K = 3.7 29.95 66.35

Sample=? CY32 VEIN IN K-FELDSPAR OXNO.=? -23

ELEM	OX	STRUCT
Na2O	3.29	.974
MgO	9.34	2.125
Al2O3	11.72	2.108
SiO2	40.28	6.15
K2O	1.71	.333
CaO	10.96	1.792
TiO2	.65	.075
MnO	1.39	.18
FeO	20.66	2.638
TOTAL	98.98	16.375
MG/MG+FE=		44.61

CA: MG: FE = 27.34 32.42 40.24

CA: NA: K = 57.83 31.43 10.75

Sample=? CY33B PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.55	.757
Al2O3	2.15	.095
SiO2	51.15	1.917
CaO	23.9	.96
TiO2	.72	.02
FeO	8.53	.267
TOTAL	100.17	4.016
MG/MG+FE=		73.93
CA: MG: FE =	48.39	38.16 13.46
CA: NA: K =	100	0 0

Sample=? CY33B ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.81	.772
Al2O3	2.48	.109
SiO2	50.44	1.891
CaO	23.94	.962
TiO2	1.03	.029
FeO	8.27	.259
TOTAL	100.19	4.022
MG/MG+FE=		74.68
CA: MG: FE =	48.27	38.74 13
CA: NA: K =	100	0 0

Sample=? CY33B MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	4.4	.896
SiO2	33.43	6.118
CaO	32.76	6.041
TiO2	3.45	.448
MnO	.32	.047
FeO	23.65	3.415
TOTAL	99.23	16.985
MG/MG+FE=		0
CA: MG: FE =	63.96	0 36.04
CA: NA: K =	100	0 0

Sample=? CY33B PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	14.66	.815
Al2O3	2.17	.095
SiO2	51.34	1.914
CaO	23.41	.935
TiO2	.65	.018
FeO	7.74	.241
TOTAL	102.01	4.018
MG/MG+FE=		77.18
CA: MG: FE =	46.96	40.93 12.1
CA: NA: K =	100	0 0

Sample=? CY33B APLITE PART FELDSPAR

ELEM	OX	STRUCT
Na2O	3.18	.564
Al2O3	18.23	1.966
SiO2	65.48	5.989
K2O	12.41	1.448
CaO	.7	.069
TOTAL	101.89	10.036
CA: MG: FE =	100	0 0
CA: NA: K =	3.32	27.1 69.58

OXNO.=? -16

Sample=? CY33B FELDSPAR APLITE PART

ELEM	OX	STRUCT
Na2O	2.71	.482
Al2O3	16.52	2.003
SiO2	64.86	5.953
K2O	13.08	1.532
CaO	.81	.08
TOTAL	102.83	10.05
CA: MG: FE =	100	0 0
CA: NA: K =	3.82	23.02 73.16

OXNO.=? -16

Sample=? CY33B FELDSPAR HIBRID PART

ELEM	OX	STRUCT
Na2O	3.06	.542
Al2O3	18.97	2.044
SiO2	64.95	5.936
K2O	12.24	1.427
CaO	.78	.077
TOTAL	102.05	10.026
CA: MG: FE =	100	0 0
CA: NA: K =	3.76	26.49 69.75

Sample=? CY33EK-FELDSPAR OXNO.=? -1

ELEM	OX	STRUCT
Na2O	1.02	.184
Al2O3	17.91	1.951
SiO2	64.9	5.996
K2O	15.24	1.796
CaO	.91	.09
TOTAL	98.07	10.017
CA: MG: FE =	100	0 0
CA: NA: K =	4.35	8.89 86.76

Sample=? CY33E ANOTHER K- FELDSPAR OXNO.=? -1

ELEM	OX	STRUCT
Na2O	.97	.174
Al2O3	17.67	1.928
SiO2	64.84	6.004
K2O	15.64	1.847
CaO	.88	.087
TOTAL	97.36	10.04
CA: MG: FE =	100	0 0
CA: NA: K =	4.13	8.25 87.62

Sample=? CY33E SMALL K-FELDSPAR CRYSTAL OXNO.=? -1

ELEM	OX	STRUCT
Na2O	.97	.174
Al2O3	17.82	1.939
SiO2	65.12	6.011
K2O	15.19	1.789
CaO	.91	.09
TOTAL	100.63	10.003
CA: MG: FE =	100	0 0
CA: NA: K =	4.38	8.48 87.14

Sample=? CY33E ANOTHER CRYSTAL OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.54	.097
Al2O3	17.89	1.953
SiO2	64.75	5.996
K2O	15.94	1.883
CaO	.88	.087
TOTAL	101.79	10.016
CA: MG: FE =	100	0 0
CA: NA: K =	4.31	4.69 91.1

Sample=? CY33E PYROXENE

ELEM	OX	STRUCT
Na2O	.54	.04
MgO	11.36	.643
Al2O3	4.93	.221
SiO2	48.17	1.83
CaO	22.79	.928
TiO2	1.22	.035
MnO	.32	.01
FeO	10.66	.339
TOTAL	102.11	4.046
MG/MG+FE=		65.48
CA: MG: FE =	48.59	33.66 17.75
CA: NA: K =	95.87	4.13 0

Sample=? CY33E BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	13.38	1.461
Al2O3	15.65	1.351
SiO2	36.67	2.685
K2O	9.61	.898
CaO	.49	.038
TiO2	3.52	.194
MnO	.27	.017
FeO	20.4	1.25
TOTAL	98.91	7.894
MG/MG+FE=		53.89
CA: MG: FE =	1.38	53.15 45.47
CA: NA: K =	4.06	0 95.94

Sample=? CY33EPYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	14.28	.792
Al2O3	1.87	.082
SiO2	52.09	1.938
CaO	23.32	.93
TiO2	.63	.018
FeO	7.81	.243
TOTAL	101.62	4.003
MG/MG+FE=		76.52
CA: MG: FE =	47.33	40.31 12.37
CA: NA: K =	100	0 0

Sample=? CY33E K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.13	.378
Al2O3	19.07	2.059
SiO2	64.75	5.932
K2O	13.12	1.533
CaO	.92	.091
TOTAL	98.27	9.993

CA: MG: FE = 100 0 0

CA: NA: K = 4.35 18.88 76.57

Sample=? CY33C AMPHIBOLE?? OXNO.=? -23

ELEM	OX	STRUCT
MgO	16.22	3.622
Al2O3	14.34	2.533
SiO2	40.13	6.013
K2O	10.31	1.971
CaO	.67	.108
TiO2	1.62	.182
MnO	1.01	.128
FeO	15.7	1.967
TOTAL	95.29	16.524

MG/MG+FE= 64.81

CA: MG: FE = 1.9 63.58 34.53

CA: NA: K = 5.19 0 94.81

Sample=? CY33C BIOTITE ON MAGNETITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	18.29	1.935
Al2O3	14.36	1.201
SiO2	40.6	2.881
K2O	10.42	.943
CaO	.66	.05
TiO2	1.05	.056
MnO	.39	.023
FeO	14.23	.844
TOTAL	98.44	7.933

MG/MG+FE= 69.63

Sample=? CY33CPYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.35	.1
MgO	10.18	.58
Al2O3	2.32	.105
SiO2	50.74	1.938
CaO	21.94	.898
TiO2	.38	.011
MnO	.34	.011
FeO	12.75	.407
TOTAL	104.91	4.05

MG/MG+FE= 58.76

CA: MG: FE = 47.64 30.77 21.59

CA: NA: K = 89.98 10.02 0

Sample=? CY33CK-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.47	.262
Al2O3	18.86	2.045
SiO2	64.45	5.93
K2O	13.82	1.622
CaO	1.08	.106
FeO	.32	.025
TOTAL	103.55	9.99

CA: NA: K = 5.33 13.17 81.51

Sample=? CY34 BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	11.97	1.321
Al2O3	13.59	1.185
SiO2	38.48	2.849
K2O	9.91	.936
CaO	.56	.044
TiO2	2.27	.126
MnO	.67	.042
FeO	22.53	1.395
TOTAL	97.1	7.898

MG/MG+FE= 48.64

CA: MG: FE = 1.59 47.86 50.54

CA: NA: K = 4.49 0 95.51

Sample=? CY34 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.68	.299
Al2O3	18.22	1.963
SiO2	65.87	6.021
K2O	13.31	1.552
CaO	.94	.092
TOTAL	101.9	9.927

Sample=? CY34PYX. LATH SHAPED OXNO.=? -6

ELEM	OX	STRUCT
Na2O	3.79	.287
MgO	6.78	.395
Al2O3	1.25	.057
SiO2	51.32	2.004
CaO	17.67	.74
MnO	.75	.025
FeO	18.45	.603
TOTAL	102.87	4.111

MG/MG+FE= 39.58

CA: MG: FE = 42.58 22.73 34.7

CA: NA: K = 72.05 27.95 0

Sample=? CY34PYX. CLOT OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.69	.051
MgO	11.62	.658
Al2O3	4.19	.188
SiO2	48.67	1.847
CaO	23.37	.95
TiO2	1.1	.031
MnO	.26	.008
FeO	10.12	.321
TOTAL	102.79	4.054

MG/MG+FE= 67.21

CA: MG: FE = 49.25 34.11 16.64

CA: NA: K = 94.91 5.09 0

Sample=? CY34PYX. OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.86	.139
MgO	8.94	.512
Al2O3	2.61	.118
SiO2	50.36	1.936
CaO	21.11	.87
TiO2	.5	.014
MnO	.66	.021
FeO	13.95	.448
TOTAL	103.57	4.058

MG/MG+FE= 53.33

CA: MG: FE = 47.54 27.98 24.48

CA: NA: K = 86.22 13.78 0

Sample=? CY34K-FELDSPAR C-BARIUM OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.14	.378
Al2O3	20.05	2.147
SiO2	63.38	5.759
K2O	10.6	1.229
CaO	.8	.078
TiO2	2.49	.17
FeO	.53	.04
TOTAL	98.9	9.80099

MG/MG+FE= 0

CA: NA: K = 4.63 22.43 72.94

Sample=? CY34 PYX. OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.41	.748
Al2O3	1.08	.048
SiO2	52.65	1.971
CaO	23.86	.957
MnO	.27	.009
FeO	8.74	.273
TOTAL	102.94	4.006

MG/MG+FE= 73.26

CA: MG: FE = 48.38 37.82 13.8

CA: NA: K = 100 0 0

Sample=? CY34 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.22	.396
Al2O3	18.44	1.995
SiO2	65.03	5.967
K2O	13.15	1.54
CaO	.91	.089
FeO	.24	.019
TOTAL	103.69	10.006

CA: NA: K = 4.4 19.56 76.05

Sample=? CY35PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.1	.156
MgO	10.25	.585
Al2O3	1.19	.054
SiO2	51.6	1.976
CaO	20.69	.849
MnO	.53	.017
FeO	13.64	.437
TOTAL	103.6	4.074
MG/MG+FE=		57.24

CA: MG: FE = 45.38 31.27 23.36
CA: NA: K = 84.48 15.52 0

Sample=? CY35K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.26	.402
Al2O3	18.5	1.998
SiO2	65.25	5.977
K2O	13.25	1.549
CaO	.73	.071
TOTAL	100.92	9.997

CA: MG: FE = 100 0 0
CA: NA: K = 3.51 19.88 76.61

Sample=? CY35 MAGNETITE OXNO.=? -8

ELEM	OX	STRUCT
MgO	.7	.097
Al2O3	.94	.104
TiO2	.92	.064
Cr2O3	.28	.021
MnO	.74	.058
FeO	96.43	7.53
TOTAL	95.4	7.874
MG/MG+FE=		1.27

CA: MG: FE = 0 1.27 98.73

Sample=? CY35 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.55	.115
MgO	10.79	.616
Al2O3	1	.045
SiO2	51.38	1.965
CaO	21.24	.871
TiO2	.35	.01
MnO	.54	.018
FeO	13.16	.421
TOTAL	102.85	4.061
MG/MG+FE=		59.4

CA: MG: FE = 45.65 32.29 22.06
CA: NA: K = 88.34 11.66 0

Sample=? CY35 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.33	.414
Al2O3	18.67	2.017
SiO2	65.01	5.959
K2O	13.21	1.545
CaO	.77	.076
TOTAL	102.4	10.011

CA: MG: FE = 100 0 0
CA: NA: K = 3.73 20.34 75.92

Sample=? CY35 ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.52	.112
MgO	11.84	.67
Al2O3	.64	.029
SiO2	52.32	1.985
CaO	21.6	.878
MnO	.45	.015
FeO	11.62	.369
TOTAL	103.31	4.058
MG/MG+FE=		64.49

CA: MG: FE = 45.8 34.95 19.25
CA: NA: K = 88.69 11.31 0

Sample=? CY35 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.02	.333
Al2O3	18.63	2.008
SiO2	65.22	5.964
K2O	12.4	1.446
CaO	.73	.071
TOTAL	102.9	10.024

CA: MG: FE = 100 0 0
CA: NA: K = 3.46 26.07 70.47

Sample=? CY35 ANOTHER K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.16	.384
Al2O3	18.01	1.949
SiO2	65.4	6.004
K2O	13.66	1.6
CaO	.78	.077
TOTAL	102.51	10.014

CA: MG: FE = 100 0 0
CA: NA: K = 3.74 18.63 77.63

Sample=? CY35 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.05	.076
MgO	13.55	.757
Al2O3	.68	.03
SiO2	52.75	1.978
CaO	22.33	.897
Cr2O3	.31	.009
MnO	.35	.011
FeO	9.01	.282
TOTAL	104.74	4.04
MG/MG+FE=		72.86

CA: MG: FE = 46.33 39.1 14.57
CA: NA: K = 92.19 7.81 0

Sample=? CY35 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.87	.51
Al2O3	18.59	2.008
SiO2	65.01	5.955
K2O	12.7	1.484
CaO	.84	.082
TOTAL	101.98	10.039

CA: MG: FE = 100 0 0
CA: NA: K = 3.95 24.57 71.48

Sample=? CY35K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.75	.488
Al2O3	18.78	2.028
SiO2	64.9	5.944
K2O	12.73	1.488
CaO	.84	.082
TOTAL	102.43	10.03

CA: MG: FE = 100 0 0
CA: NA: K = 3.98 23.71 72.3

Sample=? CY39 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.66	.295
Al2O3	19.08	2.066
SiO2	64.07	5.885
K2O	13.58	1.591
CaO	.85	.084
TiO2	.77	.053

TOTAL 101.93 9.974

CA: MG: FE = 100 0 0

CA: NA: K = 4.26 14.97 80.76

Sample=? CY39 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.52	.272
Al2O3	19.59	2.126
SiO2	62.53	5.755
K2O	13.33	1.566
CaO	.91	.09
TiO2	2.12	.147

TOTAL 100.11 9.956

CA: MG: FE = 100 0 0

CA: NA: K = 4.67 14.11 81.22

Sample=? CY39 K-FELDSPAR INTERSTITIAL OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.09	1.894
Al2O3	19.27	2
SiO2	67.79	5.969
K2O	1.28	.143
FeO	.57	.042

TOTAL 100.01 10.048

MG/MG+FE= 0

CA: MG: FE = 0 0 100

CA: NA: K = 0 92.98 7.02

Sample=? CY39 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.42	.253
Al2O3	19.63	2.132
SiO2	62.21	5.73
K2O	13.33	1.567
CaO	.98	.097
TiO2	2.44	.169

TOTAL 101.85 9.94799

CA: MG: FE = 100 0 0

CA: NA: K = 5.06 13.2 81.74

Sample=? CY44 GARNET AGAIN OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	17.18	3.195
SiO2	38.39	6.056
CaO	33.75	5.706
MnO	1.73	.231
FeO	8.78	1.159

Total 95.46 16.3463

Mg/Mg+Fe= 0

Ca: Mg: Fe = 83.12 0 16.88

Ca: Na: K = 100 0 0

AFM Ratio = 57.95

Sample=? CY44 CORE OF MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Na2O	.26	.084
MgO	.54	.136
Al2O3	6.44	1.292
SiO2	35.06	5.972
CaO	31.7	5.785
TiO2	4.1	.526
MnO	.86	.124
FeO	20.91	2.979

Total 95.97 16.8983

Mg/Mg+Fe= 4.37

Ca: Mg: Fe = 65 1.53 33.47

Ca: Na: K = 98.57 1.43 0

AFM Ratio = 17.18

Sample=? CY44 REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	.32	.107
MgO	.59	.15
Al2O3	6.47	1.3
SiO2	34.99	5.962
CaO	31.63	5.775
TiO2	4.12	.528
MnO	.86	.125
FeO	20.83	2.968

Total 100.51 16.9141

Mg/Mg+Fe= 4.81

Ca: Mg: Fe = 64.94 1.69 33.37

Ca: Na: K = 98.18 1.82 0

AFM Ratio = 17.25

Sample=? CY44 LIGHTER ZONE ABOUT ABOVE

ELEM	OX	STRUCT
Na2O	.41	.136
MgO	.53	.134
Al2O3	6.07	1.222
SiO2	35.76	6.106
CaO	31.67	5.793
TiO2	2.98	.382
MnO	.94	.135
FeO	21.44	3.061

Total 98.3 16.9688

Mg/Mg+Fe= 4.19

Ca: Mg: Fe = 64.45 1.49 34.06

Ca: Na: K = 97.71 2.29 0

AFM Ratio = 16.05

Sample=? CY44 DARKER ZONE ABOUT ABOVE

ELEM	OX	STRUCT
Na2O	.39	.131
MgO	.53	.138
Al2O3	4.28	.875
SiO2	35.55	6.173
CaO	31.46	5.853
TiO2	2.34	.305
MnO	1.05	.155
FeO	24.23	3.519

Total 99.31 17.1495

Mg/Mg+Fe= 3.77

Ca: Mg: Fe = 61.55 1.45 37

Ca: Na: K = 97.81 2.19 0

AFM Ratio = 10.69

Sample=? CY44 OUTER ZONE SPHENE OXNO.=? -10

ELEM	OX	STRUCT
MgO	.23	.023
Al2O3	6.26	.49
SiO2	32.47	2.155
CaO	29.03	2.064
TiO2	24.92	1.244
MnO	.92	.052
FeO	5.91	.328

Total 95.34 6.3561

Mg/Mg+Fe= 6.55

Ca: Mg: Fe = 85.47 .95 13.58

Ca: Na: K = 100 0 0

AFM Ratio = 41.11

Sample=? SANME AS ABOVE

ELEM	OX	STRUCT
Na2O	.42	.138
MgO	.6	.151
Al2O3	6.81	1.368
SiO2	35.12	5.984
CaO	31.65	5.778
TiO2	3.51	.45
MnO	.99	.144
FeO	20.63	2.94

Total 103.09 16.9522

Mg/Mg+Fe= 4.89

Ca: Mg: Fe = 65.15 1.7 33.15

Ca: Na: K = 97.67 2.33 0

Sample=? CY44 ALTERED ZONE ABOUT ABOVE

ELEM	OX	STRUCT
Al2O3	10.91	2.101
SiO2	36.24	5.921
CaO	32.41	5.676
TiO2	5.57	.685
MnO	1.74	.241
FeO	12.58	1.719

Total 101.24 16.3434

Mg/Mg+Fe= 0

Ca: Mg: Fe = 76.75 0 23.25

Ca: Na: K = 100 0 0

Sample=? CY44 ABOVE ANOTHER PART

ELEM	OX	STRUCT
Na2O	.3	.093
MgO	.3	.072
Al2O3	12.02	2.3
SiO2	36.8	5.973
CaO	34	5.913
TiO2	3.15	.384
MnO	1.01	.139
FeO	12.28	1.667
Total	102.26	16.5396

Mg/Mg+Fe= 4.14

Ca: Mg: Fe = 77.27 .94 21.79

Ca: Na: K = 98.45 1.55 0

Sample=? CY44 ABOVE AS PHENOCRYST IN GROUND MASS

ELEM	OX	STRUCT
Al2O3	13.38	2.55
SiO2	37.88	6.123
CaO	33.38	5.782
TiO2	1.03	.125
MnO	1.35	.185
FeO	12.66	1.712
Total	102.13	16.4767

Mg/Mg+Fe= 0

Ca: Mg: Fe = 77.16 0 22.84

Ca: Na: K = 100 0 0

AFM Ratio = 42.68

Sample=? CY44 SAME ANOTHER GARNET EDGE

ELEM	OX	STRUCT
Na2O	.27	.086
MgO	.36	.087
Al2O3	12.52	2.398
SiO2	36.99	6.013
CaO	32.45	5.653
TiO2	2.33	.285
MnO	2.03	.28
FeO	12.82	1.744
Total	103.84	16.5457

Mg/Mg+Fe= 4.75

Ca: Mg: Fe = 75.53 1.16 23.3

Ca: Na: K = 98.5 1.5 0

AFM Ratio = 39.57

Sample=? CY44 PINK GARNET IN FELDSPAR OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	16.54	3.092
SiO2	38.1	6.042
CaO	33.57	5.704
Cr2O3	.25	.031
MnO	2.17	.292
FeO	9.3	1.234
Total	101.98	16.3959

Mg/Mg+Fe= 0

Ca: Mg: Fe = 82.21 0 17.79

Ca: Na: K = 100 0 0

AFM Ratio = 55.61

Sample=? CY44 K-FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.82	.325
Al2O3	18.56	2.01
SiO2	64.82	5.957
K2O	13.53	1.586
CaO	1.17	.115
Total	99.54	9.9933

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.68 16.04 78.28

AFM Ratio = 100

Sample=? CY44 PINK GARNET PHENOCRYST OXNO.=? -24

ELEM	OX	STRUCT
Na2O	.22	.071
Al2O3	11.18	2.166
SiO2	37.2	6.113
CaO	33.62	5.921
TiO2	1.5	.186
MnO	1.18	.164
FeO	14.8	2.034
Total	101.82	16.6544

Mg/Mg+Fe= 0

Ca: Mg: Fe = 74.43 0 25.57

Ca: Na: K = 98.82 1.18 0

AFM Ratio = 34.74

Sample=? CY44 BIOTITE OXNO.=? 11

ELEM	OX	STRUCT
MgO	13.23	1.441
Al2O3	15.68	1.351
SiO2	38.27	2.796
K2O	8.75	.815
CaO	.66	.051
TiO2	1.03	.057
MnO	1.7	.105
FeO	20.66	1.262
TOTAL	96.2	7.878

MG/MG+FE= 53.31

CA: MG: FE = 1.85 52.32 45.82

CA: NA: K = 5.89 0 94.11

Sample=? CY44PYROXENE OXNO.=? 6

ELEM	OX	STRUCT
Na2O	2.17	.164
MgO	7.54	.437
Al2O3	4.23	.194
SiO2	48.65	1.89
CaO	20.06	.835
TiO2	.42	.012
MnO	.84	.028
FeO	16.09	.523
TOTAL	101.48	4.083

MG/MG+FE= 45.52

CA: MG: FE = 46.52 24.35 29.14

CA: NA: K = 83.58 16.42 0

Sample=? CY44MELANITE OXNO.=? 24

ELEM	OX	STRUCT
Al2O3	12.79	2.432
SiO2	37.67	6.077
CaO	33.19	5.736
TiO2	2.32	.281
MnO	2.03	.277
FeO	11.99	1.617
TOTAL	95.51	16.42

MG/MG+FE= 0

CA: MG: FE = 78.01 0 21.99

CA: NA: K = 100 0 0

Sample=? CY44MELANITE OXNO.=? 24

ELEM	OX	STRUCT
Al2O3	12.36	2.358
SiO2	37.52	6.073
CaO	33.34	5.783
TiO2	2.4	.292
MnO	1.69	.232
FeO	12.68	1.717
TOTAL	97.71	16.455

MG/MG+FE= 0

CA: MG: FE = 77.11 0 22.89

CA: NA: K = 100 0 0

Sample=? CY44ZOISITE OXNO.=? 25

ELEM	OX	STRUCT
Na2O	9.23	2.533
Al2O3	23.9	3.986
SiO2	58.61	8.292
K2O	1.28	.23
CaO	6.97	1.056
TOTAL	95.37	16.097

CA: MG: FE = 100 0 0

CA: NA: K = 27.65 66.33 6.02

Sample=? CY44 GM FELDSPAR OXNO.=? 16

ELEM	OX	STRUCT
Na2O	1.94	.346
Al2O3	18.65	2.02
SiO2	64.75	5.951
K2O	13.74	1.612
CaO	.91	.09
TOTAL	99.58	10.019

CA: MG: FE = 100 0 0

CA: NA: K = 4.39 16.89 78.71

CY44,45B,45C

Sample=? CY44 ZOISITE OXNO.=? 25

ELEM	OX	STRUCT
Na2O	7.39	1.985
Al2O3	24.51	4.003
SiO2	62.57	8.671
K2O	2.66	.471
CaO	2.88	.428
TOTAL	91.19	15.558

CA: MG: FE = 100 0 0
CA: NA: K = 14.84 68.83 16.33

Sample=? CY44 FELDSPATHOID? SCAPOLITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	1.64	.404
Al2O3	18.39	2.748
SiO2	64.54	8.185
K2O	14.4	2.329
CaO	1.04	.141
TOTAL	98.3	13.807

CA: MG: FE = 100 0 0
CA: NA: K = 4.91 14.06 81.04

Sample=? CY44 ALTERED MELANITE? OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	15.88	2.979
SiO2	37.92	6.035
CaO	34.13	5.821
TiO2	.64	.077
MnO	1.28	.173
FeO	9.87	1.314
Total	95.19	16.3983

Mg/Mg+Fe= 0
Ca: Mg: Fe = 81.58 0 18.42
Ca: Na: K = 100 0 0
AFM Ratio = 53.13

Sample=? CY44 ALTERED MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	13.81	2.608
SiO2	38.54	6.177
K2O	.4	.083
CaO	32.13	5.518
TiO2	1.52	.183
MnO	1.81	.246
FeO	11.65	1.562
Total	93.83	16.377

Mg/Mg+Fe= 0
Ca: Mg: Fe = 77.94 0 22.06
Ca: Na: K = 98.52 0 1.48
AFM Ratio = 45.5

Sample=? CY44 GARNET OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	12.54	2.333
SiO2	41.14	6.494
CaO	37.3	6.308
TiO2	.32	.038
Cr2O3	.21	.027
MnO	1.03	.137
FeO	7.21	.951
Total	95.68	16.2884

Mg/Mg+Fe= 0
Ca: Mg: Fe = 86.9 0 13.1
Ca: Na: K = 100 0 0
AFM Ratio = 55.09

Sample=? CY45B FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.55	1.293
Al2O3	23.23	2.417
SiO2	63.74	5.629
K2O	1.02	.115
CaO	4.36	.413
Total	101.13	9.8668

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 22.68 71 6.32
AFM Ratio = 100

Sample=? CY45B K-FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.08	.369
Al2O3	18.86	2.036
SiO2	64.51	5.908
K2O	12.82	1.498
CaO	1.08	.106
TiO2	.65	.044
Total	98.54	9.9626

No such option!
Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.37 18.7 75.92
AFM Ratio = 100

Sample=? CY45B ANOTHER K-FELDSPAR

ELEM	OX	STRUCT
Na2O	5.59	.97
MgO	1.02	.136
Al2O3	18.06	1.905
SiO2	66.82	5.981
K2O	5.5	.628
CaO	1.59	.152
FeO	1.26	.094
Total	101.53	9.8658

No such option!
Ca: Mg: Fe = 39.79 35.6 24.61
Ca: Na: K = 8.69 55.43 35.89
AFM Ratio = 80.55

Sample=? CY45C INC. IN P. FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.65	1.307
Al2O3	22.33	2.319
SiO2	64.96	5.722
K2O	1.25	.14
CaO	3.76	.355
Total	101.59	9.8424

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 19.7 72.53 7.77
AFM Ratio = 100

Sample=? CY45C SMALL PHENOCRYST OF K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.03	.361
Al2O3	18.21	1.969
SiO2	65.29	5.992
K2O	13.58	1.59
CaO	.89	.087
Total	101.93	9.9994

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.27 17.71 78.02

Sample=? CY45C PLAGIOCLASE PHENOCRYST

ELEM	OX	STRUCT
Na2O	7.61	1.3
Al2O3	22.27	2.311
SiO2	65.06	5.73
K2O	1.3	.146
CaO	3.72	.351
Total	100.93	9.8377

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 19.53 72.34 8.12
AFM Ratio = 100

CY46A, 45C

Sample=? CY45C FELDSPAR ABOUT ABOVE

ELEM	OX	STRUCT
Na2O	6.83	1.173
Al2O3	24.31	2.539
SiO2	62.09	5.501
K2O	.86	.097
CaO	5.85	.556
Total	100.69	9.8646

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 30.45 64.24 5.31

AFM Ratio = 100

Sample=? CY45C PYROXENE PHENOCRYST

OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.25	.018
MgO	11.44	.65
Al2O3	.42	.019
SiO2	52.09	1.984
CaO	23.19	.946
MnO	.23	.007
FeO	12.28	.391
Total	100.71	4.0157

Mg/Mg+Fe= 62.44

Ca: Mg: Fe = 47.61 32.71 19.68

Ca: Na: K = 98.13 1.87 0

AFM Ratio = .9

Sample=? CY45C ANOTHER A- AMPHIBOLE

NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	1.67	.487
MgO	9.69	2.171
Al2O3	9.14	1.618
SiO2	44.22	6.644
K2O	1.29	.248
CaO	11.22	1.806
TiO2	.77	.087
MnO	.63	.08
FeO	21.38	2.687
Total	102.65	15.827

Mg/Mg+Fe= 44.69

Ca: Mg: Fe = 27.1 32.58 40.32

Ca: Na: K = 71.07 19.17 9.76

AFM Ratio = 14.28

Sample=? CY45C FELDSPAR

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.09	1.216
Al2O3	22.57	2.353
SiO2	64.18	5.678
K2O	1.85	.209
CaO	4.24	.402
Total	97.72	9.8586

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 22 66.56 11.44

Sample=? CY45C ANOTHER GM. GRAIN

ELEM	OX	STRUCT
Na2O	.96	.172
Al2O3	17.49	1.904
SiO2	65.33	6.036
K2O	15.51	1.828
CaO	.71	.071
Total	100.18	10.0117

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.43 8.31 88.27

AFM Ratio = 100

Sample=? CY45C FELDSPAR

ELEM	OX	STRUCT
Na2O	5.98	1.031
Al2O3	25.83	2.706
SiO2	59.99	5.334
K2O	.62	.07
CaO	7.58	.722
Total	99.94	9.864

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 39.61 56.56 3.84

AFM Ratio = 100

Sample=? CY45C FELDSPAR

ELEM	OX	STRUCT
Na2O	6.61	1.136
Al2O3	24.98	2.611
SiO2	61.28	5.433
K2O	.4	.046
CaO	6.61	.628
Total	99.51	9.8526

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 34.7 62.76 2.54

AFM Ratio = 100

Sample=? CY-46A BIAXIAL MINERAL

ELEM	OX	STRUCT
Na2O	.92	.155
MgO	1.72	.222
Al2O3	19.86	2.022
SiO2	69.86	6.034
K2O	2.83	.311
CaO	4.42	.409
TiO2	.28	.018
Total	76.49	9.1702

Mg/Mg+Fe= 100

Ca: Mg: Fe = 64.82 35.18 0

Ca: Na: K = 46.74 17.71 35.54

AFM Ratio = 82

Sample=? CY46A AGAIN

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.74	.311
Al2O3	17.54	1.907
SiO2	64.03	5.908
K2O	13.36	1.573
CaO	2.01	.199
TiO2	1.32	.091
Total	98.86	9.989

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 9.55 14.93 75.52

AFM Ratio = 100

Sample=? CY46A GREEN AMPHIBOLE

OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.62	.444
MgO	17.66	3.716
Al2O3	1.95	.325
SiO2	54.42	7.68
K2O	.47	.085
CaO	11.26	1.702
MnO	.23	.028
FeO	12.21	1.441
Total	97.38	15.4218

Mg/Mg+Fe= 72.06

Ca: Mg: Fe = 24.81 54.18 21.01

Ca: Na: K = 76.29 19.9 3.81

AFM Ratio = 3.05

Sample=? CY46A AGAIN ANOTHER PART

FIBROUS AS PYROXENE

OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2	.143
MgO	16.05	.886
Al2O3	2.87	.125
SiO2	53.77	1.991
K2O	.74	.035
CaO	10.57	.419
TiO2	.21	.006
MnO	.34	.011
FeO	13.36	.414
Total	97.1	4.0297

Mg/Mg+Fe= 68.15

Ca: Mg: Fe = 24.37 51.54 24.08

Ca: Na: K = 70.18 23.95 5.86

AFM Ratio = 4.59

Sample=? CY47C FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.65	1.152
Al2O3	26.49	2.791
SiO2	60.24	5.384
K2O	3.81	.434
CaO	2.13	.204
FeO	.71	.053
TOTAL	98.46	10.018

MG/MG+FE= 0

CA: MG: FE = 79.38 0 20.62

CA: NA: K = 11.4 64.36 24.25

Sample=? CY47C AMPHIBOLE WITH CHLORINE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.93	.59
MgO	4.15	.975
Al2O3	10.09	1.877
SiO2	40.71	6.426
K2O	1.58	.318
CaO	11.22	1.898
MnO	1.2	.161
FeO	29.14	3.847
TOTAL	100.74	16.092

MG/MG+FE= 20.22

CA: MG: FE = 28.24 14.51 57.25

CA: NA: K = 67.64 21.03 11.33

Sample=? CY47C ANOTHER PART OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.73	1.512
Al2O3	21.73	2.286
SiO2	62.55	5.583
K2O	.48	.055
CaO	6.49	.621
TOTAL	98.28	10.057

CA: MG: FE = 100 0 0

CA: NA: K = 28.38 69.1 2.51

Sample=? CY47C PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.12	.084
MgO	10.41	.603
Al2O3	5.16	.236
SiO2	48.58	1.886
K2O	.58	.029
CaO	11.7	.486
MnO	1.33	.044
FeO	21.11	.685
TOTAL	101.13	4.053

MG/MG+FE= 46.82

CA: MG: FE = 27.4 33.99 38.61

CA: NA: K = 81.14 14.02 4.84

Sample=? CY48FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.49	1.625
Al2O3	22.2	2.311
SiO2	64.52	5.697
K2O	.81	.091
CaO	2.99	.283
TOTAL	98.54	10.007

CA: MG: FE = 100 0 0

CA: NA: K = 14.16 81.29 4.55

Sample=? CY48 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.4	1.448
Al2O3	24.39	2.557
SiO2	61.22	5.445
K2O	.55	.063
CaO	5.43	.517
TOTAL	100.13	10.03

CA: MG: FE = 100 0 0

CA: NA: K = 25.49 71.4 3.11

Sample=? CY48 SPHENE OXNO.=? -5

ELEM	OX	STRUCT
Al2O3	2.08	.08
SiO2	30.48	.997
CaO	28.56	1.001
TiO2	37.05	.924
FeO	1.33	.036
TOTAL	98.39	3.038

MG/MG+FE= 0

CA: MG: FE = 96.53 0 3.47

CA: NA: K = 100 0 0

Sample=? CY48 ANOTHER SPHENE OXNO.=? -5

ELEM	OX	STRUCT
Al2O3	2.02	.078
SiO2	30.61	1.001
CaO	28.26	.99
TiO2	37.73	.927
FeO	1.38	.038
TOTAL	98.05	3.034

MG/MG+FE= 0

CA: MG: FE = 96.3 0 3.7

CA: NA: K = 100 0 0

Sample=? CY48 K-FELDSPAR AGAINST ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.52	.272
Al2O3	18.42	2.002
SiO2	64.67	5.961
K2O	14.52	1.707
CaO	.87	.086
TOTAL	101.2	10.028

CA: MG: FE = 100 0 0

CA: NA: K = 4.16 13.17 82.66

Sample=? CY48 PYROXENE ABOUT ABOVE OXNO.=?

ELEM	OX	STRUCT
Na2O	.65	.048
MgO	10.61	.601
Al2O3	.96	.043
SiO2	52.65	2.001
CaO	21.31	.868
MnO	1.15	.037
FeO	12.66	.402
TOTAL	100.34	4

MG/MG+FE= 59.92

CA: MG: FE = 46.39 32.12 21.49

CA: NA: K = 94.76 5.24 0

Sample=? CY48 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.23	1.583
Al2O3	22.37	2.332
SiO2	64.15	5.673
K2O	.96	.109
CaO	3.27	.31
TOTAL	99.67	10.007

CA: MG: FE = 100 0 0

CA: NA: K = 15.48 79.07 5.44

Sample=? CY48 ANOTHER PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.32	1.433
Al2O3	24.49	2.564
SiO2	61.29	5.445
K2O	.4	.045
CaO	5.51	.525
TOTAL	100.09	10.012

CA: MG: FE = 100 0 0

CA: NA: K = 26.21 71.54 2.25

Sample=? CY48 FELDSPAR SURROUNDING OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.18	.389
Al2O3	18.4	1.994
SiO2	64.97	5.97
K2O	13.76	1.613
CaO	.69	.068
TOTAL	100.21	10.034

CA: MG: FE = 100 0 0

CA: NA: K = 3.29 18.79 77.92

Sample=? CY48 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.29	1.431
Al2O3	24.19	2.538
SiO2	61.2	5.449
K2O	.64	.073
CaO	5.43	.542
TOTAL	101.13	10.033

CA: MG: FE = 100 0 0

CA: NA: K = 26.49 69.94 3.57

Sample=? CY48 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.48	1.462
Al2O3	24.09	2.525
SiO2	61.34	5.473
K2O	.65	.074
CaO	5.23	.499
TOTAL	99.84	10.033
CA: MG: FE =	100	0 0
CA: NA: K =	24.52	71.84 3.64

Sample=? CY48 FELDSPAR SURROUNDING ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.2	.215
Al2O3	18.27	1.987
SiO2	64.77	5.975
K2O	14.89	1.752
CaO	.85	.084
TOTAL	100.98	10.013
CA: MG: FE =	100	0 0
CA: NA: K =	4.1	10.48 85.42

Sample=? CY48 PYROXENE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.7	.052
MgO	11.14	.635
Al2O3	.57	.026
SiO2	51.75	1.978
CaO	22.15	.907
MnO	.76	.025
FeO	12.93	.413
TOTAL	99.82	4.036
MG/MG+FE=		60.59
CA: MG: FE =	46.39	32.48 21.13
CA: NA: K =	94.58	5.42 0

Sample=? CY48 INCLUSION IN ABOVE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	10.07	1.731
MgO	.43	.057
Al2O3	20.54	2.147
SiO2	64.71	5.738
K2O	.28	.031
CaO	3.33	.316
FeO	.64	.048
TOTAL	100.6	10.068
MG/MG+FE=		54.29
CA: MG: FE =	75.06	13.54 11.4
CA: NA: K =	15.21	83.3 1.49

Sample=? CY48 K-FELDSPAR ABOUT ALL OF ABOVE

ELEM	OX	STRUCT
Na2O	3.15	.554
Al2O3	17.61	1.88
SiO2	67.26	6.091
K2O	11.23	1.297
CaO	.76	.073
TOTAL	101.6	9.895
CA: MG: FE =	100	0 0
CA: NA: K =	3.79	28.79 67.41

Sample=? CY48 PYROXENE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.62	.122
MgO	8.85	.511
Al2O3	1.98	.091
SiO2	50.21	1.945
CaO	20.93	.869
MnO	1.03	.034
FeO	15.37	.498
TOTAL	102.42	4.07
MG/MG+FE=		50.64
CA: MG: FE =	46.27	27.21 26.52
CA: NA: K =	87.69	12.31 0

Sample=? CY48 FELDSPAR NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.74	1.733
Al2O3	21.09	2.187
SiO2	65.93	5.602
K2O	.37	.042
CaO	1.86	.175
TOTAL	100.87	10.039
CA: MG: FE =	100	0 0
CA: NA: K =	8.54	89.41 2.05

Sample=? CY48 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.51	.038
MgO	10.51	.602
SiO2	51.73	1.987
CaO	23.04	.948
MnO	.5	.016
FeO	13.69	.44
TOTAL	101.62	4.031
MG/MG+FE=		57.77
CA: MG: FE =	47.64	30.25 22.11
CA: NA: K =	96.15	3.85 0

Sample=? CY48PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.8	.059
MgO	10.6	.605
Al2O3	.45	.02
SiO2	51.9	1.987
CaO	21.98	.902
MnO	.7	.023
FeO	13.56	.434
TOTAL	100.07	4.03
MG/MG+FE=		58.23
CA: MG: FE =	46.47	31.17 22.36
CA: NA: K =	93.86	6.14 0

Sample=? CY48 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.73	.053
MgO	11.89	.672
Al2O3	.72	.032
SiO2	52.35	1.984
CaO	22.23	.903
MnO	.85	.027
FeO	11.26	.357
TOTAL	100.96	4.028
MG/MG+FE=		65.31
CA: MG: FE =	46.74	34.78 18.45
CA: NA: K =	94.46	5.54 0

Sample=? CY48 PLAGIOCLASE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	9.56	1.638
Al2O3	22.52	2.347
SiO2	63.92	5.651
K2O	.53	.06
CaO	3.46	.327
TOTAL	100.8	10.023
CA: MG: FE =	100	0 0
CA: NA: K =	16.15	80.89 2.96

Sample=? CY48 ANOTHER PLAGIO CLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.48	1.463
Al2O3	24.39	2.558
SiO2	61.12	5.437
K2O	.46	.052
CaO	5.54	.528
TOTAL	100.28	10.038
CA: MG: FE =	100	0 0
CA: NA: K =	25.84	71.61 2.55

Sample=? CY48 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
MgO	.32	.039
Al2O3	4.86	.475
SiO2	90.55	7.511
K2O	4.26	.451
TOTAL	101.73	8.476
MG/MG+FE=		100
CA: MG: FE =	0	100 0
CA: NA: K =	0	0 100

Sample=? CY48 K-FELDSPAR INTER GROWWN WITH ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.82	1.016
Al2O3	17.56	2.075
SiO2	65.33	5.906
K2O	7.67	.881
CaO	1.33	.128
TOTAL	99.53	10.006
CA: MG: FE =	100	0 0
CA: NA: K =	6.32	50.17 43.51

Sample=? CY48 AMPHIBOLE CORE OF ALTERED CRYSTAL OXNO. =? -23

ELEM	OX	STRUCT
Na2O	2.2	.623
MgO	13.68	2.982
Al2O3	5.65	.974
SiO2	48.58	7.104
K2O	.93	.173
CaO	11.14	1.745
TiO2	.27	.029
MnO	.59	.074
FeO	16.97	2.075
TOTAL	99	15.779

MG/MG+FE= 50.97

CA: MG: FE = 25.65 43.84 30.51

CA: NA: K = 68.67 24.52 6.81

Sample=? CY49 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.86	.333
Al2O3	18.2	1.976
SiO2	64.76	5.966
K2O	14.08	1.655
CaO	1.11	.11

Total 100.32 10.0392

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.24 15.87 78.88

AFM Ratio = 100

Sample=? CY49 K-FELDSPAR

ELEM	OX	STRUCT
Na2O	2.26	.403
Al2O3	18.4	1.998
SiO2	64.2	5.913
K2O	13.34	1.568
CaO	1.48	.146
TiO2	.32	.022

Total 98.24 10.0507

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 6.9 17.04 74.07

AFM Ratio = 100

Sample=? CY49 ANOTHER SPOT EDGE OF K-FELDSPAR

ELEM	OX	STRUCT
Na2O	1.71	.305
Al2O3	18.63	2.022
SiO2	64.23	5.915
K2O	13.87	1.629
CaO	1.15	.114
TiO2	.41	.028

Total 99.19 10.0131

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.57 14.89 79.54

AFM Ratio = 100

Sample=? CY49 EDGE OF PLAG. NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	7.45	1.29
Al2O3	22.48	2.366
SiO2	61.04	5.452
K2O	.48	.054
CaO	6.08	.582
TiO2	2.19	.147

Total 99.59 9.8903

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 30.22 66.98 2.8

AFM Ratio = 100

Sample=? CY49 ANOTHER SPOT EDGE OF K-FELDSPAR

ELEM	OX	STRUCT
Na2O	1.62	.29
Al2O3	18.38	1.996
SiO2	64.66	5.959
K2O	14.32	1.684
CaO	1.03	.101

Total 100.19 10.0299

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.87 13.98 81.16

AFM Ratio = 100

Sample=? CY49 EDGE PLAGE NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	7.18	1.229
Al2O3	24.1	2.508
SiO2	62.86	5.549
K2O	.66	.074
CaO	5.16	.488

Total 98.44 9.8484

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 27.25 68.62 4.13

AFM Ratio = 100

Sample=? CY49 ANOTHER SPOT 1

ELEM	OX	STRUCT
Na2O	6.27	1.069
Al2O3	18.65	1.932
SiO2	69.2	6.082
K2O	3.69	.413
CaO	2.09	.197

Total 100.92 9.6932

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 11.73 63.67 24.6

AFM Ratio = 100

Sample=? CY49 EDGE OF PLAGE NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	7.06	1.214
Al2O3	24.53	2.565
SiO2	61.65	5.469
K2O	.75	.085
CaO	5.95	.565

Total 99.35 9.8983

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 30.31 65.13 4.56

AFM Ratio = 100

Sample=? ANOTHER SPOT EDGE OF PLAGIOCLASE

ELEM	OX	STRUCT
Na2O	8.92	1.19
Al2O3	24.35	2.546
SiO2	61.96	5.495
K2O	.69	.078
CaO	5.86	.557

Total 97.82 9.8665

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 30.52 65.21 4.27

AFM Ratio = 100

Sample=? CY49 EDGE OF K-FELDSPAR NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	5.92	1.026
Al2O3	21.33	2.248
SiO2	64.48	5.765
K2O	5.19	.592
CaO	3.01	.289

Total 97.62 9.9199

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 15.15 53.8 31.04

AFM Ratio = 100

Sample=? CY49 ANOTHER SPOT EDGE K-FELDSPAR

ELEM	OX	STRUCT
Na2O	2.05	.364
Al2O3	18.02	1.943
SiO2	65.82	6.021
K2O	13.11	1.53
CaO	.99	.097

Total 99.76 9.955

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.87 18.28 76.85

AFM Ratio = 100

Sample=? CY49 EDGE PLAGE NEAR ABOVE

ELEM	OX	STRUCT
Na2O	7.6	1.307
Al2O3	23.62	2.469
SiO2	62.63	5.554
K2O	.42	.047
CaO	5.39	.512

Total 99.95 9.8892

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 27.44 70.04 2.52

AFM Ratio = 100

Sample=? ANOTHER SPOT EDGE K-FELDSPAR

ELEM	OX	STRUCT
NA2O	1.82	.325
AL2O3	18.36	1.996
SIO2	64.55	5.954
K2O	14.22	1.673
CaO	1	.099
Total	99.68	10.0473

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.72 15.5 79.78

AFM Ratio = 100

Sample=? CY49 K-FELDSPAR

ELEM	OX	STRUCT
Na2O	1.09	.195
Al2O3	18.16	1.98
SiO2	64.41	5.958
K2O	15.06	1.777
CaO	1.29	.128
Total	98.35	10.0377

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 6.1 9.29 84.62

AFM Ratio = 100

SAMPLE=? CY49 PYROXENE

ELEM	OX	STRUCT
NA2O	.53	.038
MGO	10.81	.614
AL2O3	1.89	.084
SIO2	51.21	1.953
CAO	22.05	.901
MNO	1.37	.044
FEO	12.16	.387
TOTAL	100.4	4.025

CA: MG: FE = 47.34 32.29 20.37

SAMPLE=? CY49 K-FELDSPAR ABOUT ABOVE

ELEM	OX	STRUCT
NA2O	1.58	.278
AL2O3	18.91	2.033
SIO2	65.52	5.977
K2O	12.93	1.504
CAO	1.06	.103
TOTAL	100	9.898

CA: NA: K = 5.51 14.78 79.71

SAMPLE=? CY49 PYROXENE XTAL.

ELEM	OX	STRUCT
NA2O	.55	.04
MGO	11.41	.646
AL2O3	1.1	.049
SIO2	51.85	1.971
CAO	22.15	.902
CR2O3	.28	.008
MNO	1.18	.037
FEO	11.49	.365
TOTAL	100.6	4.021

CA: MG: FE = 47.14 33.78 19.08

SAMPLE=? CY49 PLAG. PHENOCRYST

ELEM	OX	STRUCT
NA2O	9.34	1.604
AL2O3	22.79	2.379
SIO2	63.36	5.612
K2O	.61	.069
CAO	3.9	.37
TOTAL	101	10.036

CA: NA: K = 18.12 78.48 3.39

SAMPLE=? CY49 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	1.48	.262
AL2O3	18.84	2.025
SIO2	65.63	5.986
K2O	13.03	1.516
CAO	1.02	.099
TOTAL	99.8	9.891

CA: NA: K = 5.31 13.96 80.73

SAMPLE=? CY49 CORE XTAL.IN FELDS. EPIDOTE? OXNO.=? -6

ELEM	OX	STRUCT
AL2O3	31.44	2.664
SIO2	41.27	2.967
CAO	25.28	1.947
FEO	2.02	.121
TOTAL	91.8	7.702

CA: NA: K = 100 0 0

SAMPLE=? CY49 LGHT. GMASS OXNO.=? -16

ELEM	OX	STRUCT
NA2O	1.17	.207
AL2O3	18.71	2.013
SIO2	65.63	5.993
K2O	13.38	1.559
CAO	1.12	.109
TOTAL	100	9.884

CA: NA: K = 5.84 11.07 83.1

SAMPLE=? CY49 EXSOLUTION IN ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	11.23	1.915
AL2O3	20.63	2.139
SIO2	66.4	5.841
K2O	.37	.041
CAO	1.36	.127
TOTAL	99.7	10.066

CA: NA: K = 6.13 91.86 2.01

SAMPLE=? CY49 DK.GM. XTAL OXNO.=? -16

ELEM	OX	STRUCT
NA2O	9.84	1.689
AL2O3	22.64	2.362
SIO2	63.56	5.626
K2O	.43	.048
CAO	3.55	.337
TOTAL	100.7	10.064

CA: NA: K = 16.24 81.4 2.36

SAMPLE=? CY49 SMALL PYROXENE XTAL IN ABOVE

ELEM	OX	STRUCT
MGO	10.84	.612
AL2O3	1.72	.076
SIO2	52.45	1.986
K2O	.36	.017
CAO	21.62	.877
MNO	1.2	.038
FEO	11.78	.373
TOTAL	99.7	3.982

CA: NA: K = 98.04 0 1.96

SAMPLE=? CY49 K-FELDSPAR PHENOCRYST

ELEM	OX	STRUCT
NA2O	1.19	.209
AL2O3	18.69	2.009
SIO2	65.87	6.008
K2O	13.36	1.554
CAO	.92	.09
TOTAL	100.1	9.872

CA: NA: K = 4.87 11.31 83.82

SAMPLE=? CY49 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	.49	.086
AL2O3	18.71	2.018
SIO2	65.48	5.994
K2O	14.2	1.658
CAO	1.13	.111
TOTAL	99.2	9.869

CA: NA: K = 5.99 4.64 89.37

SAMPLE=? CY49 XTAL. ABOUT ABOVE

ELEM	OX	STRUCT
NA2O	8.36	1.44
AL2O3	23.94	2.508
SIO2	61.84	5.496
K2O	.88	.099
CAO	4.98	.474
TOTAL	100.2	10.02

CA: NA: K = 23.55 71.5 4.95

SAMPLE=? CY49 EDGE OF ABOVE XTAL. OXNO.=? -16

ELEM	OX	STRUCT
NA2O	9.21	1.579
AL2O3	22.75	2.372
SIO2	63.66	5.632
K2O	.76	.085
CAO	3.62	.343
TOTAL	100.9	10.014

CA: NA: K = 17.1 78.63 4.27

CY49, 50

SAMPLE=? CY49FELDSPAR XTAL. OXNO.=? -16

ELEM	OX	STRUCT
NA2O	8.92	1.534
AL2O3	23.77	2.485
SIO2	62.21	5.517
K2O	.4	.044
CAO	4.69	.445
TOTAL	100.9	10.029

CA: NA: K = 22 75.78 2.22

SAMPLE=? CY49 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	3.73	.654
AL2O3	19.46	2.074
SIO2	65.44	5.918
K2O	9.99	1.152
CAO	1.04	.1
TIO2	.35	.023
TOTAL	99.5	9.924

CA: NA: K = 5.26 34.33 60.41

SAMPLE=? CY49 K-FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
NA2O	1.62	.285
AL2O3	19.16	2.057
SIO2	65.14	5.934
K2O	12.47	1.449
CAO	1.12	.109
TIO2	.5	.034
TOTAL	98.3	9.87

CA: NA: K = 5.93 15.49 78.58

SAMPLE=? CY49PCENTRE PLAG. PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
NA2O	10.23	1.755
AL2O3	21.81	2.274
SIO2	64.41	5.7
K2O	.53	.059
CAO	2.71	.257
FEO	.31	.022
TOTAL	101.4	10.07

CA: NA: K = 12.42 84.7 2.88

SAMPLE=? CY49 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	8.45	1.457
AL2O3	24.32	2.548
SIO2	61.31	5.451
K2O	.53	.06
CAO	5.39	.513
TOTAL	100.2	10.032

CA: NA: K = 25.28 71.76 2.96

SAMPLE=? CY49 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	10.22	1.749
AL2O3	21.88	2.276
SIO2	64.71	5.712
K2O	.46	.051
CAO	2.74	.259
TOTAL	100.8	10.05

CA: NA: K = 12.59 84.9 2.5

SAMPLE=? CY49EDGE OF PYROXENE XTAL OXNO.=? -6

ELEM	OX	STRUCT
NA2O	1.06	.078
MGO	10.28	.585
AL2O3	1.87	.084
SIO2	51.26	1.959
CAO	21.38	.875
MNO	1.21	.039
FEO	12.94	.413
TOTAL	101.2	4.038

CA: MG: FE = 46.7 31.24 22.06

SAMPLE=? CY49 INCLUSION IN ABOVE OXNO.=? -6

ELEM	OX	STRUCT
NA2O	11.16	1.902
AL2O3	19.16	1.985
SIO2	67.81	5.961
K2O	.47	.052
CAO	.81	.076
FEO	.58	.042
TOTAL	101.8	10.022

CA: NA: K = 3.76 93.64 2.59

SAMPLE=? CY49 CENTRE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	.7	.052
MGO	10.25	.585
AL2O3	1.19	.053
SIO2	51.58	1.975
CAO	21.62	.887
MNO	1.34	.043
FEO	13.34	.427
TOTAL	101.3	4.024

CA: MG: FE = 46.7 30.8 22.49

Sample=? CY50 PYX. OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.35	.856
Al2O3	1.47	.065
SiO2	52.09	1.947
CaO	19.04	.763
TiO2	.52	.015
MnO	.31	.01
FeO	11.22	.351
TOTAL	102.84	4.007

Mg/Mg+Fe= 70.92

Ca: Mg: Fe = 38.73 43.45 17.82

Ca: Na: K = 100 0 0

Sample=? CY50 MINERAL OXNO.=? -6

ELEM	OX	STRUCT
MgO	19.37	1.038
Al2O3	1.63	.069
SiO2	56.88	2.045
CaO	12.1	.466
MnO	.37	.011
FeO	9.65	.29
TOTAL	99.19	3.919

Mg/Mg+Fe= 78.16

Ca: Mg: Fe = 25.98 57.86 16.16

Ca: Na: K = 100 0 0

Sample=? CY50 PYX. OXNO.=? -6

ELEM	OX	STRUCT
MgO	19.22	1.031
Al2O3	1.8	.076
SiO2	56.84	2.046
CaO	11.31	.436
MnO	.28	.009
FeO	10.55	.318
TOTAL	99.06	3.916

Mg/Mg+Fe= 76.43

Ca: Mg: Fe = 24.43 57.76 17.82

Ca: Na: K = 100 0 0

Sample=? CY50 EXSOLVED PIGEONITE OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.13	.899
Al2O3	1.59	.07
SiO2	52.46	1.961
CaO	16.56	.664
TiO2	.39	.011
FeO	12.38	.387
Total	104.4	3.9925

Mg/Mg+Fe= 69.91

Ca: Mg: Fe = 34.05 46.1 19.85

Ca: Na: K = 100 0 0

AFM Ratio = 2.65

Sample=? CY50 ANOTHER PART OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.68	.05
MgO	14.84	.827
Al2O3	2.77	.122
SiO2	52.84	1.974
CaO	12.78	.512
TiO2	.54	.015
FeO	15.21	.475
Total	101.69	3.9745

Mg/Mg+Fe= 63.52

Ca: Mg: Fe = 28.22 45.59 26.19

Ca: Na: K = 91.1 8.9 0

AFM Ratio = 4.48

Sample=? CY50 GREENISH ALTERATION PRODUCT OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.27	.019
MgO	17.31	.951
Al2O3	1.92	.083
SiO2	54.28	1.999
K2O	.23	.011
CaO	11.86	.468
TiO2	.41	.011
MnO	.25	.008
FeO	13.42	.413
Total	99.03	3.9631

Mg/Mg+Fe= 69.72

Ca: Mg: Fe = 25.55 51.91 22.54

Ca: Na: K = 93.98 3.82 2.21

AFM Ratio = 2.95

Sample=? CY50 ANOTHER GREEN BIT OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.74	.054
MgO	15.06	.854
Al2O3	2.25	.101
SiO2	48.27	1.836
CaO	10.85	.442
TiO2	5.38	.154
MnO	.29	.009
FeO	16.87	.537
Total	102.75	3.987

Mg/Mg+Fe= 61.39

Ca: Mg: Fe = 24.11 46.59 29.3

Ca: Na: K = 89.11 10.89 0

AFM Ratio = 3.5

Sample=? CY50 ANOTHER GREEN BIT OXNO.=? - 6

ELEM	OX	STRUCT
Na2O	.39	.028
MgO	16.33	.896
Al2O3	2.07	.09
SiO2	55.3	2.035
CaO	11.94	.471
FeO	13.47	.415
Total	98.17	3.9339

Mg/Mg+Fe= 68.34

Ca: Mg: Fe = 26.43 50.28 23.29

Ca: Na: K = 94.39 5.61 0

AFM Ratio = 3.32

Sample=? CY52AMPH1 CENTRE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.12	.599
MgO	8.59	1.868
Al2O3	13.36	2.298
SiO2	39.1	5.707
K2O	1.51	.28
CaO	11.6	1.814
TiO2	2.27	.249
MnO	.35	.043
FeO	21.12	2.319
TOTAL	95.46	15.177

MG/MG+FE= 44.61

CA: MG: FE = 30.23 31.13 38.64

Sample=? CY52AMPH2 CENTRE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.1	.599
MgO	8.01	1.755
Al2O3	13.89	2.406
SiO2	37.97	5.582
K2O	2.16	.404
CaO	11.54	1.818
TiO2	2.3	.254
MnO	.35	.043
FeO	21.66	2.396
TOTAL	96.1	15.257

MG/MG+FE= 42.28

CA: MG: FE = 30.46 29.4 40.14

Sample=? CY52EDGE ABOVE OXNO.=? -6

ELEM	OX	STRUCT
Al2O3	22.92	1.014
SiO2	38.63	1.45
CaO	23.39	.941
FeO	15.05	.425
TOTAL	96.84	3.83

MG/MG+FE= 0

CA: MG: FE = 68.89 0 31.11

Sample=? CY52RPT ABOVE OXNO.=? -6

ELEM	OX	STRUCT
Al2O3	23.52	1.037
SiO2	38.98	1.458
CaO	23.66	.948
MnO	.34	.011
FeO	13.5	.38
TOTAL	97.68	3.834

MG/MG+FE= 0

CA: MG: FE = 71.39 0 28.61

Sample=? CY52CY52ZOISITE? OXNO.=? -25

ELEM	OX	STRUCT
MgO	18.36	4.126
SiO2	54.83	8.267
CaO	25.98	4.198
FeO	.84	.096
TOTAL	98.5	16.687

4.004

CA: MG: FE = 49.86 49 1.14

Sample=? CY52AMPH CENTRE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.05	.578
MgO	9.34	2.023
Al2O3	14.17	2.428
SiO2	39.38	5.725
K2O	2	.371
CaO	11.5	1.792
TiO2	1.75	.191
MnO	.35	.043
FeO	19.47	2.13
TOTAL	100.99	15.281

MG/MG+FE= 48.71

CA: MG: FE = 30.14 34.03 35.83

Sample=? CY52 AMPH EDGE ABOVE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.98	.562
MgO	8.52	1.859
Al2O3	13.74	2.369
SiO2	38.61	5.649
K2O	2	.373
CaO	11.42	1.79
TiO2	2.37	.261
MnO	.36	.045
FeO	21	2.312
TOTAL	100.36	15.22

MG/MG+FE= 44.57

CA: MG: FE = 30.03 31.19 38.79

SAMPLE=? CY52 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
NA2O	1.95	.577
MGO	7.23	1.643
AL2O3	12.6	2.265
SIO2	40.84	6.227
K2O	1.88	.365
CAO	10.77	1.76
TIO2	1.15	.131
MNO	.93	.12
FEO	22.63	2.886
TOTAL	98.5	15.979

SAMPLE=? CY52 AMPHIBOLE CENTRE OF ABOVE OXNO.=? -23

ELEM	OX	STRUCT
NA2O	1.82	.537
MGO	7.49	1.7
AL2O3	12.98	2.329
SIO2	40.24	6.126
K2O	1.93	.374
CAO	11.12	1.814
TIO2	1.7	.194
MNO	.7	.089
FEO	22.02	2.804
TOTAL	95.1	15.972

SAMPLE=? CY52 ABOVE AGAIN OXNO.=? -23

ELEM	OX	STRUCT
NA2O	1.98	.577
MGO	8.9	1.995
AL2O3	14.28	2.531
SIO2	39.83	5.988
K2O	2.02	.388
CAO	11.19	1.803
TIO2	1.83	.207
CR2O3	.34	.039
MNO	.44	.055
FEO	19.16	2.408
TOTAL	97.5	15.998

SAMPLE=? CY52 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
NA2O	1.75	.52
MGO	6.98	1.594
AL2O3	14.19	2.563
SIO2	38.81	5.947
K2O	2.1	.409
CAO	11.32	1.858
TIO2	1.5	.173
MNO	.8	.103
FEO	22.55	2.89
TOTAL	96.9	16.064

SAMPLE=? CY52 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
NA2O	1.81	.536
MGO	6.95	1.587
AL2O3	12.94	2.339
SIO2	39.9	6.117
K2O	1.92	.374
CAO	11.22	1.843
TIO2	1.25	.144
MNO	.92	.119
FEO	23.12	2.964
TOTAL	97.3	16.028

SAMPLE=? CY52 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	7.21	1.225
AL2O3	23.58	2.435
SIO2	64.52	5.653
K2O	.36	.04
CAO	4.32	.405
TOTAL	100.9	9.761

SAMPLE=? CY52 ABOVE REPEATED OXNO.=? -16

ELEM	OX	STRUCT
NA2O	7.25	1.23
AL2O3	23.47	2.421
SIO2	64.82	5.673
K2O	.35	.038
CAO	4.11	.385
TOTAL	100.4	9.751

SAMPLE=? CY52 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	8.07	1.364
MGO	.33	.043
AL2O3	21.52	2.21
SIO2	67.23	5.86
K2O	.7	.077
CAO	2.14	.199
TOTAL	103.2	9.756

SAMPLE=? CY52 EDGEO OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	5.89	1.01
AL2O3	25.55	2.662
SIO2	61.25	5.416
K2O	.7	.078
CAO	6.62	.627
TOTAL	104.7	9.795

SAMPLE=? CY52 PLAG. PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
NA2O	5.93	1.016
AL2O3	25.26	2.632
SIO2	61.52	5.439
K2O	.69	.077
CAO	6.59	.624
TOTAL	99	9.791

SAMPLE=? CY52 FELDSPAR PHENOCRYST

ELEM	OX	STRUCT	OXNO.=? -16
NA2O	6.3	1.079	
AL2O3	24.89	2.593	
SIO2	61.91	5.473	
K2O	.84	.095	
CAO	6.06	.573	

SAMPLE=? CY53 AMPHIBOLE XTAL OXNO.=? -23

QFEM	OX	STRUCT
NA2O	2.37	.688
MGO	9.25	2.065
AL2O3	13.81	2.437
SIO2	40.17	6.015
K2O	1.78	.34
CAO	11.63	1.865
TIO2	2.4	.27
MNO	.34	.042
FEO	18.23	2.282
TOTAL	100	16.009

CA: MG: FE = 30.02 33.24 36.74

SAMPLE=? CY53PPYROXENE CORE OF XTAL OXNO.=? -6

QFEM	OX	STRUCT
MGO	15.79	.867
AL2O3	1.85	.08
SIO2	52.8	1.946
CAO	22.77	.899
TIO2	.33	.009
FEO	6.47	.199
TOTAL	101.9	4.004

CA: MG: FE = 45.73 44.12 10.15

SAMPLE=? CY53 ANOTHER PART OF ABOVE OXNO.=? -20

QFEM	OX	STRUCT
NA2O	2.26	.67
MGO	6.73	1.531
AL2O3	14.83	2.668
SIO2	38.68	5.903
K2O	2.1	.408
C		
AO	11.26	1.842
TIO2	1.95	.223
MNO	.61	.078
FEO	21.6	2.757
TOTAL	99.5	16.083

CA: MG: FE = 30.05 24.98 44.97

SAMPLE=? CY53 FELDSPAR XTAL. OXNO.=? -16

GLEM	OX	STRUCT
NA2O	10.23	1.751
AL2O3	22.07	2.296
SIO2	64.52	5.695
K2O	.34	.037
CAO	2.84	.268
TOTAL	99.8	10.05

CA: NA: K = 13.06 85.1 1.85

SAMPLE=? CY53 CENTRE ABOVE FELDSPAR OXNO.=? -16

ALEM	OX	STRUCT
AL2O3	18.9	2.036
SIO2	65.63	6.001
K2O	14.43	1.683
CAO	1.06	.104
TOTAL	97.2	9.826

CA: NA: K = 5.83 0 94.17

SAMPLE=? CY53 FELDSPAR PHENOCRYST OXNO.=? -16

ALEM	OX	STRUCT
NA2O	8.71	1.497
AL2O3	23.39	2.445
SIO2	62.7	5.562
K2O	.95	.107
CAO	4.24	.402
TOTAL	99.1	10.017

CA: NA: K = 20.06 74.57 5.36

SAMPLE=? CY53 CENTRE OF ABOVE OXNO.=? -16
SABEFORE? 0

LEM	OX	STRUCT
NA2O	8.55	1.471
AL2O3	23.69	2.48
SIO2	62.19	5.523
K2O	.87	.098
CAO	4.72	.448
TOTAL	99.6	10.023

CA: NA: K = 22.23 72.9 4.87

CY53

SAMPLE=? CY53 OPP. EDGE ABOZE XTAL.

ELEM	OX	STRUCT
NA20	8.6	1.479
AL203	23.58	2.465
SI02	62.57	5.549
K20	.94	.106
CAO	4.32	.41
TOTAL	97.4	10.012

OXNO.=? -16

CA: NA: K = 20.58 74.09 5.32

SAMPLE=? CY53 AMPHIBOLE XTAL IN FELDSPAR

ELEM	OX	STRUCT
NA20	1.98	.569
MGO	10.71	2.368
AL203	13.38	2.333
SI02	41.5	6.154
K20	2.13	.403
CAO	11.89	1.889
TI02	1.55	.172
MNO	.34	.042
FEO	16.52	2.048
TOTAL	96.8	15.989

OXNO.=? -23

CA: MG: FE = 29.97 37.55 32.49

SAMPLE=? CY53 EDGE OF ABOVE

ELEM	OX	STRUCT
NA20	1.98	.58
MGO	7.68	1.727
AL203	15.49	2.757
SI02	38.59	5.826
K20	2.12	.408
CAO	11.63	1.88
TI02	2.64	.299
MNO	.49	.062
FEO	19.36	2.444
TOTAL	96.1	15.987

OXNO.=? -23

CA: MG: FE = 31.07 28.54 40.38

SAMPLE=? CY53 FELDSPAR AROUND ABOVE CENTRE

ELEM	OX	STRUCT
AL203	18.14	1.945
SI02	66.85	6.083
K20	13.95	1.619
CAO	1.05	.102
TOTAL	98.8	9.751

OXNO.=? -16

CA: NA: K = 5.94 0 94.06

SAMPLE=? CY53 EDGE OF ABOVE FELDSP. XTAL.

ELEM	OX	STRUCT
AL203	18.8	2.027
SI02	65.59	6.001
K20	14.55	1.698
CAO	1.05	.102
TOTAL	98	9.832

OXNO.=? -16

CA: NA: K = 5.71 0 94.29

SAMPLE=? CY53 OPP. EDGE OF ABOVE

ELEM	OX	STRUCT
NA20	3.44	.591
AL203	17.16	1.793
SI02	70.06	6.213
K20	7.44	.842
CAO	1.32	.125
FEO	.6	.044
TOTAL	99.6	9.61

OXNO.=? -16

CA: NA: K = 8.02 37.93 54.05

SAMPLE=? CY53 CENTRE AMPHIBOLE PHENOCRYST

ELEM	OX	STRUCT
NA20	1.95	.579
MGO	6.65	1.515
AL203	13.21	2.38
SI02	40.11	6.133
K20	1.95	.38
CAO	11.45	1.875
TI02	1.32	.151
MNO	.89	.115
FEO	22.47	2.874
TOTAL	97.7	16.006

OXNO.=? -23

CA: MG: FE = 29.93 24.19 45.88

SAMPLE=? CY53 EDGE OF ABOVE

ELEM	OX	STRUCT
NA20	1.89	.559
MGO	6.67	1.52
AL203	13.13	2.368
SI02	40.15	6.144
K20	1.99	.388
CAO	11.25	1.844
TI02	1.23	.142
MNO	.9	.117
FEO	22.8	2.917
TOTAL	96.9	16.004

OXNO.=? -23

CA: MG: FE = 29.36 24.2 46.44

SAMPLE=? CY53 PYROXENE XTAL.

ELEM	OX	STRUCT
MGO	14.39	.797
AL203	2.46	.107
SI02	51.83	1.927
CAO	22.78	.907
TI02	.42	.011
FEO	8.09	.251
TOTAL	99	4.005

OXNO.=? -6

CA: MG: FE = 46.38 40.77 12.86

SAMPLE=? CY53 FELDSPAR PHENOCRYST

ELEM	OX	STRUCT
NA20	9.71	1.657
AL203	20.96	2.175
SI02	66.21	5.832
K20	1.43	.161
CAO	1.68	.158
TOTAL	98	9.986

OXNO.=? -16

CA: NA: K = 8.02 83.84 8.15

SAMPLE=? CY53 EGE XTAL ABOVE

ELEM	OX	STRUCT
NA20	.61	.107
AL203	18.69	2.015
SI02	65.5	5.994
K20	14.05	1.639
CAO	1.16	.113
TOTAL	100	9.872

OXNO.=? -16

CA: NA: K = 6.12 5.78 88.1

SAMPLE=? CY53GM. FELDSPAR

ELEM	OX	STRUCT
NA20	7.33	1.268
AL203	25.38	2.669
SI02	59.9	5.345
K20	.94	.106
CAO	6.45	.616
TOTAL	101.1	10.007

OXNO.=? -16

CA: NA: K = 30.95 63.68 5.37

SAMPLE=? CY53 PLAG. XTAL

ELEM	OX	STRUCT
NA20	7.79	1.346
AL203	24.68	2.592
SI02	60.69	5.408
K20	.88	.099
CAO	5.96	.569
TOTAL	99.4	10.017

OXNO.=? -16

CA: NA: K = 28.24 66.8 4.96

SAMPLE=? CY53 PLAG. XTAL

ELEM	OX	STRUCT
NA20	7.75	1.339
AL203	24.62	2.585
SI02	60.84	5.42
K20	1.01	.114
CAO	5.78	.551
TOTAL	101.3	10.013

OXNO.=? -16

CA: NA: K = 27.5 66.76 5.73

SAMPLE=? CY53 FELDSPAR PHENOCRYST

ELEM	OX	STRUCT
NA20	7.79	1.347
AL203	24.75	2.602
SI02	60.48	5.394
K20	.86	.097
CAO	6.13	.585
TOTAL	101.2	10.027

OXNO.=? -16

CA: NA: K = 28.85 66.36 4.79

CY53,54

SAMPLE=? CY53 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	8.03	1.387
AL2O3	24.17	2.536
SIO2	61.35	5.462
K2O	1.04	.117
CAO	5.4	.515
TOTAL	101.2	10.019

CA: NA: K = 25.51 68.66 5.83

SAMPLE=? CY53 V. LGE. PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
NA2O	3.82	1.517
AL2O3	23.26	2.433
SIO2	62.68	5.563
K2O	.92	.103
CAO	4.34	.412
TOTAL	101.9	10.031

CA: NA: K = 20.29 74.61 5.1

Sample=? CY53 CLEAR PYROXENE PHENOCRYST OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.27	.843
Al2O3	1.11	.049
SiO2	52.8	1.956
CaO	23.83	.946
TiO2	.37	.01
FeO	6.61	.205
TOTAL	99.39	4.009

MG/MG+FE= 80.44

CA: MG: FE = 47.44 42.28 10.28

CA: NA: K = 100 0 0

Sample=? CY53 ANOTHER PART OF ABOVE OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.44	.853
Al2O3	1.19	.052
SiO2	52.58	1.95
CaO	23.8	.946
TiO2	.3	.008
FeO	6.69	.207
TOTAL	99.86	4.016

MG/MG+FE= 80.47

CA: MG: FE = 47.16 42.52 10.32

CA: NA: K = 100 0 0

Sample=? CY54 OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.72	1.311
Al2O3	22.37	2.308
SiO2	65.84	5.762
K2O	.54	.041
CaO	3.53	.331
TOTAL	100.47	9.773

MG/MG+FE= 87.39

CA: MG: FE = 25.19 65.37 9.44

CA: NA: K = 19.44 76.98 3.58

Sample=? CY54 K FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.47	.261
Al2O3	18.35	1.984
SiO2	64.8	5.944
K2O	13.64	1.596
CaO	.85	.084
TiO2	.9	.062
TOTAL	101.02	9.931

MG/MG+FE= 87.39

CA: MG: FE = 7.87 80.51 11.62

CA: NA: K = 4.33 13.45 82.23

Sample=? CY54 INC IN ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	18.03	1.974
SiO2	63.79	5.928
K2O	16.41	1.945
CaO	.94	.093
TiO2	.83	.058
TOTAL	100.25	9.998

MG/MG+FE= 87.39

CA: MG: FE = 8.64 79.83 11.52

CA: NA: K = 4.05 11.35 84.6

Sample=? CY54CRYSTAL NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.17	.696
Al2O3	13.32	1.353
SiO2	77.25	6.654
K2O	4.59	.504
CaO	.69	.063
TOTAL	98.51	9.27

MG/MG+FE= 68.42

CA: MG: FE = 52.5 32.5 15

CA: NA: K = 4.99 55.11 39.9

Sample=? CY54 GM FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.01	1.364
Al2O3	23.01	2.383
SiO2	65.42	5.746
K2O	2.19	.246
CaO	1.39	.13
TOTAL	101.65	9.869

MG/MG+FE= 68.42

CA: MG: FE = 69.52 20.86 9.63

CA: NA: K = 7.47 78.39 14.14

Sample=? CY54 K-FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.59	.283
Al2O3	18.31	1.98
SiO2	64.97	5.96
K2O	13.66	1.599
CaO	.84	.083
TiO2	.63	.044
TOTAL	103.53	9.94899

MG/MG+FE= 68.42

CA: MG: FE = 59.29 27.86 12.86

CA: NA: K = 4.22 14.4 81.37

Sample=? CY54 REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.51	1.116
Al2O3	24.17	2.518
SiO2	62.53	5.528
K2O	.93	.105
CaO	5.86	.555
TOTAL	100.5	9.822

MG/MG+FE= 42.3

CA: MG: FE = 6.67 39.48 53.85

CA: NA: K = 31.25 62.84 5.91

Sample=? CY55FELDSPATHOID? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.9	1.527
Al2O3	19.75	2.06
SiO2	66.79	5.91
K2O	2.6	.294
CaO	1.72	.163
FeO	.26	.019
TOTAL	97.55	9.973
MG/MG+FE=		0

CA: MG: FE = 89.56 0 10.44
CA: NA: K = 8.22 76.97 14.82

Sample=? CY55 AMPHIBOLE\? OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.19	.647
MgO	7.98	1.81
Al2O3	12.2	2.189
SiO2	40.51	6.167
K2O	1.34	.26
CaO	11.32	1.846
TiO2	1.57	.18
MnO	.84	.109
FeO	22.03	2.805
Total	98.97	16.0124
Mg/Mg+Fe=		39.22

Ca: Mg: Fe = 28.57 28.01 43.41
Ca: Na: K = 67.05 23.5 9.44
AFM Ratio = 19.17

Sample=? CY55 EPIDOTE GRAIN IN G. MASS OXNO.=? -25

ELEM	OX	STRUCT
Na2O	.28	.085
Al2O3	26.25	4.851
SiO2	39.46	6.186
CaO	23.01	3.865
MnO	.83	.11
FeO	10.16	1.333
Total	95.13	16.4309
Mg/Mg+Fe=		0

Ca: Mg: Fe = 74.36 0 25.64
Ca: Na: K = 97.85 2.15 0
AFM Ratio = 64.53

Sample=? CY56 FELDSPATHOID OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.36	1.946
Al2O3	26.76	2.786
SiO2	60.86	5.376
CaO	1.02	.097
TOTAL	91.75	10.205
MG/MG+FE=		40.43

CA: MG: FE = 9.07 36.76 54.16
CA: NA: K = 4.52 90.6 4.89

Sample=? CY56 ANOTHER FELDSPATHOID OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.35	1.766
Al2O3	26.93	2.792
SiO2	61.39	5.402
CaO	1.33	.125
TOTAL	89.08	10.085
MG/MG+FE=		40.43

CA: MG: FE = 11.39 35.82 52.78
CA: NA: K = 6.26 88.48 5.26

Sample=? CY56 ANOTHER FELDSPATHOID OXNO.=? -16

ELEM	OX	STRUCT
Na2O	12.36	2.115
Al2O3	25.66	2.669
SiO2	61.97	5.469
TOTAL	87.1	10.253
MG/MG+FE=		40.43

CA: MG: FE = 11.39 35.82 52.78
CA: NA: K = 5.33 90.19 4.48

Sample=? CY56 ANOTHER FELDSPATHOID\ OXNO.=? -16

ELEM	OX	STRUCT
Na2O	12.63	2.163
Al2O3	25.24	2.628
SiO2	62.14	5.489
TOTAL	90.45	10.28
MG/MG+FE=		40.43

CA: MG: FE = 11.39 35.82 52.78
CA: NA: K = 5.22 90.39 4.39

Sample=? CY56 SCAPOLITE ON FELDSPAR OXNO.=? -16

CONTAINS S+CL

ELEM	OX	STRUCT
Na2O	3.22	.579
Al2O3	27.93	3.049
SiO2	50.29	4.659
K2O	.52	.061
CaO	18.05	1.771
TOTAL	90.4	10.139
MG/MG+FE=		40.43

CA: MG: FE = 64.82 14.22 20.96
CA: NA: K = 73.67 23.82 2.51

Sample=? CY57 LIGHT EXSOLUTION BAND OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.49	.033
MgO	13.95	.74
Al2O3	7.58	.318
SiO2	56.92	2.026
CaO	10.54	.402
FeO	10.52	.313
TOTAL	101.89	3.832
MG/MG+FE=		70.28

CA: MG: FE = 27.63 50.86 21.51
CA: NA: K = 92.41 7.59 0

Sample=? CY57LIGHT EXSOLUTION BAND\ OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.02	.867
Al2O3	1.04	.047
SiO2	51.13	1.979
CaO	3.37	.14
TiO2	.45	.013
MnO	.52	.017
FeO	28.48	.922
TOTAL	105.08	3.985
MG/MG+FE=		48.46

CA: MG: FE = 7.26 44.95 47.8
CA: NA: K = 100 0 0

Sample=? CY57 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.83	.848
Al2O3	27.64	2.953
SiO2	55	4.984
K2O	.47	.054
CaO	11.24	1.091
FeO	.84	.063
TOTAL	104.66	9.993

CA: NA: K = 54.74 42.55 2.71

Sample=? CY57 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.33	1.267
Al2O3	24.49	2.571
SiO2	60.84	5.42
K2O	.54	.062
CaO	6.35	.606
FeO	.44	.033
TOTAL	104.12	9.95899

CA: NA: K = 31.32 65.48 3.2

Sample=? CY57 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.7	.927
Al2O3	1.28	.056
SiO2	52.5	1.955
CaO	17.21	.687
TiO2	.28	.008
FeO	12.03	.375
TOTAL	99.06	4.008
MG/MG+FE=		71.2

CA: MG: FE = 34.54 46.61 18.85
CA: NA: K = 100 0 0

Sample=? CY57 ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	18.32	1.006
Al2O3	1.15	.05
SiO2	53.39	1.966
CaO	17.34	.684
FeO	9.79	.302
TOTAL	98.66	4.008
MG/MG+FE=		76.91

CA: MG: FE = 34.34 50.5 15.16
CA: NA: K = 100 0 0

Sample=? CY57 ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	21.69	1.216
Al2O3	.55	.024
SiO2	51.96	1.955
CaO	2.74	.111
MnO	.4	.013
FeO	22.64	.712
TOTAL	102.01	4.031

MG/MG+FE= 63.07

CA: MG: FE = 5.44 59.64 34.92

CA: NA: K = 100 0 0

Sample=? CY57 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.38	.763
Al2O3	1.36	.061
SiO2	50.72	1.94
CaO	16.19	.663
TiO2	.58	.017
MnO	.31	.01
FeO	17.46	.558
TOTAL	99.92	4.012

MG/MG+FE= 57.76

CA: MG: FE = 33.42 38.46 28.12

CA: NA: K = 100 0 0

Sample=? CY57 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.18	.91
Al2O3	28.44	3.041
SiO2	54.14	4.912
K2O	.47	.054
CaO	11.28	1.096
FeO	.49	.037
TOTAL	99.43	10.05

MG/MG+FE= 0

CA: MG: FE = 96.73 0 3.27

CA: NA: K = 53.2 44.17 2.62

Sample=? CY57PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	17.89	.982
Al2O3	1.23	.053
SiO2	53.44	1.968
CaO	17.97	.709
FeO	9.47	.292
TOTAL	99.42	4.004

MG/MG+FE= 77.08

CA: MG: FE = 35.75 49.52 14.73

CA: NA: K = 100 0 0

Sample=? CY57 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.56	.804
Al2O3	29.38	3.15
SiO2	52.77	4.8
K2O	.34	.039
CaO	12.49	1.218
FeO	.45	.034
TOTAL	99.16	10.045

MG/MG+FE= 0

CA: MG: FE = 97.28 0 2.72

CA: NA: K = 59.1 39.01 1.89

Sample=? CY57 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.62	.816
Al2O3	29.19	3.131
SiO2	52.88	4.812
K2O	.34	.039
CaO	12.38	1.207
FeO	.59	.045
TOTAL	99.31	10.05

MG/MG+FE= 0

CA: MG: FE = 96.41 0 3.59

CA: NA: K = 58.54 39.57 1.89

Sample=? CY60 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.5	.429
MgO	9.27	2.042
Al2O3	13.83	2.41
SiO2	41.93	6.198
K2O	1.76	.332
CaO	11.33	1.795
TiO2	2.55	.284
MnO	.32	.04
FeO	17.51	2.165
TOTAL	94.35	15.695

MG/MG+FE= 48.54

CA: MG: FE = 29.91 34.02 36.07

CA: NA: K = 70.23 16.78 12.99

Sample=? CY60ANOTHER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.09	.611
MgO	7.56	1.701
Al2O3	14.34	2.552
SiO2	39.55	5.97
K2O	1.69	.325
CaO	11.54	1.867
TiO2	2.62	.297
MnO	.43	.054
FeO	20.18	2.548
TOTAL	99.25	15.925

MG/MG+FE= 40.03

CA: MG: FE = 30.53 27.81 41.66

CA: NA: K = 66.61 21.8 11.59

Sample=? CY60ALKALI FELDSPAAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.4	1.105
Al2O3	20.54	2.155
SiO2	65.82	5.86
K2O	5.1	.579
CaO	2.14	.204
TOTAL	101.2	9.903

CA: MG: FE = 100 0 0

CA: NA: K = 10.81 58.53 30.67

Sample=? CY60GM-PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.75	1.158
Al2O3	24.85	2.589
SiO2	61.87	5.469
K2O	.47	.053
CaO	6.06	.574
TOTAL	97.54	9.843

CA: MG: FE = 100 0 0

CA: NA: K = 32.16 64.87 2.97

Sample=? CY60PLAGIOCLASE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.93	1.19
Al2O3	24.87	2.596
SiO2	61.54	5.451
K2O	.64	.072
CaO	6.02	.571
TOTAL	99.05	9.88

CA: MG: FE = 100 0 0

CA: NA: K = 31.15 64.92 3.93

Sample=? CY60K-FELDSPAR CRYSTAL OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	17.18	1.859
SiO2	66.53	6.108
K2O	15.25	1.786
CaO	1.05	.103
TOTAL	98.16	9.856

CA: MG: FE = 100 0 0

CA: NA: K = 5.45 0 94.55

Sample=? CY60PLAGIOCLASE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.7	1.148
Al2O3	24.9	2.595
SiO2	61.95	5.477
K2O	.78	.088
CaO	5.67	.537
TOTAL	96.61	9.845

CA: MG: FE = 100 0 0

CA: NA: K = 30.29 64.75 4.96

CY60, 61

Sample=? CY60GM. K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.72	.482
Al2O3	20.03	2.155
SiO2	63.94	5.836
K2O	11.26	1.311
CaO	2.04	.2
TOTAL	98.12	9.984

CA: MG: FE = 100 0 0

CA: NA: K = 10.04 24.18 65.78

Sample=? CY60 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.44	.427
MgO	7.38	1.678
Al2O3	12.36	2.223
SiO2	40.54	6.185
K2O	1.66	.324
CaO	11.56	1.89
TiO2	1.5	.172
MnO	.9	.117
FeO	22.67	2.893
TOTAL	99.13	15.909

MG/MG+FE= 36.71

CA: MG: FE = 29.25 25.97 44.78

CA: NA: K = 71.56 16.17 12.27

Sample=? CY60LGHT.GM. FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.09	1.218
Al2O3	24.47	2.554
SiO2	61.99	5.49
K2O	.83	.094
CaO	5.61	.532
TOTAL	99.58	9.888

CA: MG: FE = 100 0 0

CA: NA: K = 28.85 66.05 5.1

Sample=? CY60 DK. GM. NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.86	.304
Al2O3	9.11	.906
SiO2	84.09	7.095
K2O	4.02	.433
CaO	.91	.082
TOTAL	101.87	8.82

CA: MG: FE = 100 0 0

CA: NA: K = 10.01 37.12 52.87

Sample=? CY60 LARGE PHENOCRYST CENTRE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.93	1.868
Al2O3	19.31	2.006
SiO2	67.71	5.967
K2O	1.57	.176
FeO	.49	.036
TOTAL	101.43	10.053

MG/MG+FE= 0

CA: MG: FE = 0 0 100

CA: NA: K = 0 91.39 8.61

Sample=? CY60 SAME EDGE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.57	.801
Al2O3	18.76	1.999
SiO2	66.25	5.988
K2O	9.81	1.131
CaO	.59	.057
TOTAL	98.86	9.976

CA: MG: FE = 100 0 0

CA: NA: K = 2.87 40.27 56.86

Sample=? CY60 CENTRE AGAIN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.71	.128
Al2O3	18.93	2.056
SiO2	64.11	5.907
K2O	14.78	1.737
CaO	.83	.081
TiO2	.63	.044
TOTAL	98.42	9.953

CA: MG: FE = 100 0 0

CA: NA: K = 4.16 6.58 89.26

Sample=? CY60 LARGE PHENOCRYST EDGE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.67	.65
Al2O3	19.12	2.061
SiO2	64.52	5.9
K2O	11.62	1.356
CaO	1.08	.106
TOTAL	97.2	10.073

CA: MG: FE = 100 0 0

CA: NA: K = 5.02 30.78 64.2

Sample=? CY60 SMALLER PHENOCRYST CENTRE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.69	1.498
Al2O3	22.66	2.373
SiO2	63.17	5.613
K2O	1.47	.167
CaO	4	.381
TOTAL	101.71	10.032

CA: MG: FE = 100 0 0

CA: NA: K = 18.62 73.22 8.16

Sample=? CY60 PLAGIOCLASE PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.54	1.304
Al2O3	24.77	2.607
SiO2	60.41	5.393
K2O	1.2	.137
CaO	6.07	.581
TOTAL	99.98	10.022

CA: MG: FE = 100 0 0

CA: NA: K = 28.73 64.49 6.78

Sample=? CY61 PLAG. PHENOCRYST

ELEM	OX	STRUCT
Na2O	7.49	1.284
Al2O3	22.69	2.364
SiO2	64.1	5.665
K2O	1.54	.174
CaO	4.16	.394
Total	98.69	9.8817

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 21.27 69.33 9.4

AFM Ratio = 100

Sample=? CY61 ANOTHER PHENOCRYST

ELEM	OX	STRUCT
Na2O	6.21	1.07
Al2O3	25.18	2.639
SiO2	60.84	5.408
K2O	1.15	.13
CaO	6.56	.625
Total	99.25	9.8721

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 34.25 58.63 7.12

AFM Ratio = 100

Sample=? CY61 K-SPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.24	.043
Al2O3	18.19	1.994
SiO2	64.03	5.953
K2O	16.5	1.958
CaO	1.03	.102
Total	102.11	10.0503

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.85 2.04 93.11

AFM Ratio = 100

Sample=? CY61 PLAG. PHENOCRYST\

ELEM	OX	STRUCT
Na2O	7.31	1.25
Al2O3	22.56	2.346
SiO2	64.55	5.694
K2O	1.54	.173
CaO	4.03	.381
Total	98.68	9.8442

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 21.12 69.29 9.59

AFM Ratio = 100

Sample=? CY61 CORE

ELEM	OX	STRUCT
Na2O	6.04	1.041
MgO	.39	.052
Al2O3	24.82	2.602
SiO2	60.74	5.404
K2O	1.14	.13
CaO	6.67	.636
FeO	.21	.016
Total	101.12	9.8805
Mg/Mg+Fe=		76.47

Ca: Mg: Fe = 90.34 7.39 2.27
Ca: Na: K = 35.2 57.61 7.19
AFM Ratio = 95.03

Sample=? CY61 REPEAT EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	6.33	1.09
MgO	.34	.045
Al2O3	24.45	2.557
SiO2	61.65	5.471
K2O	1.27	.144
CaO	5.67	.539
FeO	.29	.021
Total	101.18	9.8673
Mg/Mg+Fe=		68.18

Ca: Mg: Fe = 89.09 7.44 3.47
Ca: Na: K = 30.4 61.48 8.12
AFM Ratio = 95.09

Sample=? CY61 K-FELDSPAR OVER GROWTH ON PLAGIOCLASE CRYSTAL

ELEM	OX	STRUCT
Na2O	1.34	.239
Al2O3	18.56	2.019
SiO2	64.35	5.936
K2O	14.41	1.696
CaO	1.34	.132
Total	100.35	10.0218

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 6.39 11.56 82.05
AFM Ratio = 100

Sample=? CY61 PLAGIOCLASE CRYSTAL UNDER ABOVE OVERGROWTH EDGE

ELEM	OX	STRUCT
Na2O	7.99	1.369
MgO	.45	.059
Al2O3	21.62	2.252
SiO2	64.98	5.741
K2O	1.72	.193
CaO	2.9	.275
FeO	.34	.025
Total	99.64	9.9146
Mg/Mg+Fe=		70.24

Ca: Mg: Fe = 76.6 16.43 6.98
Ca: Na: K = 14.97 74.52 10.51
AFM Ratio = 93.06

Sample=? CY61 ABOVE SLIGHTLY FURTHER IN

ELEM	OX	STRUCT
Na2O	7.86	1.344
MgO	.41	.055
Al2O3	22.47	2.337
SiO2	64.3	5.673
K2O	1.1	.124
CaO	3.65	.345
FeO	.21	.015
Total	100.06	9.8928
Mg/Mg+Fe=		78.57

Ca: Mg: Fe = 83.13 13.25 3.61
Ca: Na: K = 19.03 74.13 6.84
AFM Ratio = 94.35

Sample=? CY61 CORE OF ABOVE PLAG. CRYSTAL

ELEM	OX	STRUCT
Na2O	8.24	1.405
MgO	.4	.062
Al2O3	22.48	2.331
SiO2	64.68	5.609
K2O	.69	.078
CaO	3.53	.333
Total	99.29	9.8874
Mg/Mg+Fe=		100

Ca: Mg: Fe = 86.49 13.51 0
Ca: Na: K = 18.34 77.37 4.3
AFM Ratio = 95.73

Sample=? CY61 EDGE OF FELDSPAR CRYSTAL

ELEM	OX	STRUCT
Na2O	2.95	.521
Al2O3	19	2.042
SiO2	65.17	5.942
K2O	11.83	1.376
CaO	1.06	.104
Total	100.32	9.9851

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.2 26.04 68.77
AFM Ratio = 100

Sample=? CY61 CORE OF ABOVE CRYSTAL

ELEM	OX	STRUCT
Na2O	2.45	.432
Al2O3	19.3	2.07
SiO2	65.06	5.919
K2O	11.7	1.358
CaO	1.05	.102
TiO2	.43	.03
Total	99.02	9.9114

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.39 22.83 71.78
AFM Ratio = 100

CY61, 64,65

Sample=? CY61 K-SPAR PHENOCRYST\

ELEM	OX	STRUCT	OXNO.=? 16
Na2O	3.64	.641	
Al2O3	18.63	1.995	
SiO2	65.79	5.978	
K2O	10.96	1.271	
CaO	.98	.096	
Total	99.83	9.9806	

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.78 31.92 63.3

AFM Ratio = 100

Sample=? CY61 K-SPAR PHENOCRYST\

ELEM	OX	STRUCT
Na2O	2.38	.423
Al2O3	18.51	1.998
SiO2	65.11	5.965
K2O	12.95	1.514
CaO	1.05	.103
Total	100.98	10.004

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.05 20.74 74.22

AFM Ratio = 100

Sample=? CY61 K-SPAR PHENOCRYST

ELEM	OX	STRUCT
Na2O	2.94	.519
Al2O3	19.14	2.057
SiO2	64.92	5.918
K2O	11.67	1.357
CaO	1.04	.101
TiO2	.29	.02
Total	100.34	9.972

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.11 26.25 68.64

AFM Ratio = 100

Sample=? CY61 PLAG. PHENOCRYST\?

ELEM	OX	STRUCT
Na2O	7.26	1.244
Al2O3	22.69	2.363
SiO2	64.1	5.665
K2O	1.61	.181
CaO	4.04	.382
TiO2	.22	.015
Total	99.13	9.851

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 21.14 68.84 10.02

AFM Ratio = 100

Sample=? CY64PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.09	1.054
MgO	.48	.064
Al2O3	24.62	2.588
SiO2	60.54	5.399
K2O	1.31	.149
CaO	6.46	.618
FeO	.5	.037
TOTAL	102.66	9.90899
MG/MG+FE=		63.37

CA: MG: FE = 85.95 8.9 5.15

CA: NA: K = 33.94 57.88 8.18

Sample=? CY64 MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	18.29	3.415
SiO2	38.61	6.116
CaO	23.86	4.049
TiO2	.45	.054
FeO	18.8	2.49
TOTAL	102.85	16.124
MG/MG+FE=		0

CA: MG: FE = 61.92 0 38.08

CA: NA: K = 100 0 0

Sample=? CY64 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	10.43	.594
Al2O3	.43	.02
SiO2	52.07	1.989
CaO	23.83	.975
MnO	.34	.011
FeO	12.9	.412
TOTAL	108.02	4.001
MG/MG+FE=		59.05

CA: MG: FE = 49.22 29.98 20.8

CA: NA: K = 100 0 0

Sample=? CY64 PLAGIOCLASE PHENOCRYST

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	6.93	1.204	
MgO	.41	.055	
Al2O3	25	2.64	
SiO2	59.15	5.299	
K2O	.69	.078	
CaO	7.53	.723	
FeO	.28	.021	
TOTAL	103.59	10.02	

NO SUCH OPTION DUMMY!

CA: MG: FE = 90.49 6.88 2.63

CA: NA: K = 36.06 60.05 3.89

Sample=? CY65 ZONED FELDSPAR CENTRE

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	10.04	1.718	
Al2O3	22.09	2.296	
SiO2	64.65	5.702	
K2O	.33	.037	
CaO	2.9	.274	
TOTAL	103.08	10.027	

CA: MG: FE = 100 0 0

CA: NA: K = 13.5 84.67 1.82

Sample=? CY65 ABOVE FELDSPAR RIM

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	2.26	.4	
Al2O3	17.29	1.855	
SiO2	67.06	6.105	
K2O	12.62	1.466	
CaO	.74	.072	
TOTAL	100.44	9.898	

CA: MG: FE = 100 0 0

CA: NA: K = 3.72 20.64 75.65

Sample=? CY65 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.39	.07
Al2O3	17.52	1.903
SiO2	65.69	6.056
K2O	15.59	1.833
CaO	.8	.079
TOTAL	103.31	9.941

CA: MG: FE = 100 0 0

CA: NA: K = 3.99 3.53 92.48

Sample=? CY65 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.69	.12
Al2O3	14.53	1.536
SiO2	71.66	6.428
K2O	12.34	1.411
CaO	.78	.075
TOTAL	102.39	9.57

CA: MG: FE = 100 0 0

CA: NA: K = 4.67 7.47 87.86

Sample=? CY65CORE LARGE CRYSTAL OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.2	1.231
Al2O3	25.43	2.645
SiO2	61.91	5.462
K2O	.65	.073
CaO	4.8	.454
TOTAL	97.74	9.865

CA: MG: FE = 100 0 0

CA: NA: K = 25.82 70.02 4.15

Sample=? CY65 EDGEOF CORE CRYSTAL

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	8.11	1.4	
Al2O3	24.36	2.555	
SiO2	61.14	5.441	
K2O	.64	.072	
CaO	5.76	.55	
TOTAL	102.28	10.018	

CA: MG: FE = 100 0 0

CA: NA: K = 27.2 69.24 3.56

CY65,67

Sample=? CY65 K-FELDSPAR PHENOCRYST

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	4.46	.781	
Al2O3	19.76	2.102	
SiO2	65.22	5.886	
K2O	8.59	.989	
CaO	1.96	.189	
TOTAL	98.64	9.947	

CA: MG: FE = 100 0 0

CA: NA: K = 9.65 39.87 50.48

Sample=? CY65 CORE LARGE CRYSTAL

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	7.52	1.299	
Al2O3	25.09	2.635	
SiO2	60.28	5.37	
K2O	.49	.056	
CaO	6.6	.63	
TOTAL	101.53	9.99	

CA: MG: FE = 100 0 0

CA: NA: K = 31.74 65.44 2.82

Sample=? CY65 CORE ANOTHER LARGE CRYSTAL

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	8.2	1.411	
Al2O3	23.54	2.464	
SiO2	62.34	5.535	
K2O	.95	.108	
CaO	4.97	.473	
TOTAL	102.88	9.991	

CA: MG: FE = 100 0 0

CA: NA: K = 23.74 70.83 5.42

Sample=? CY65 RIM AROUND ABOVE CRYSTAL

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	7.47	1.291	
Al2O3	25.06	2.632	
SiO2	60.26	5.371	
K2O	.65	.074	
CaO	6.56	.627	
TOTAL	101.68	9.995	

CA: MG: FE = 100 0 0

CA: NA: K = 31.48 64.81 3.71

Sample=? CY65 CORE OF ANOTHER CRYSTAL

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	7.9	1.364	
Al2O3	24.7	2.592	
SiO2	60.71	5.406	
K2O	.51	.057	
CaO	6.2	.591	
TOTAL	102.91	10.01	

CA: MG: FE = 100 0 0

CA: NA: K = 29.37 67.79 2.83

Sample=? CY65 THICK OUTER RIM OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.92	1.199
Al2O3	25.89	2.727
SiO2	59.02	5.276
K2O	.65	.074
CaO	7.51	.72
TOTAL	101.93	9.996

CA: MG: FE = 100 0 0

CA: NA: K = 36.13 60.16 3.71

SAMPLE=? CY67 PLAG. PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
NA2O	6.98	1.212
AL2O3	26.09	2.753
SIO2	58.55	5.241
K2O	.64	.072
CAO	7.72	.74
TOTAL	98.2	10.022

CA: MG: FE = 100 0 0

SAMPLE=? CY67 REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	6.92	1.201
AL2O3	26.21	2.767
SIO2	58.36	5.227
K2O	.61	.07
CAO	7.92	.76
TOTAL	98.7	10.026

CA: NA: K = 37.42 59.13 3.46

SAMPLE=? CY67 PLAG. PHENOCRYST CENTRE

ELEM	OX	STRUCT	OXNO.=? -16
NA2O	7.39	1.234	
AL2O3	16.67	1.713	
SIO2	72.88	6.28	
K2O	.36	.039	
CAO	2.5	.231	
TOTAL	98.8	9.5	

SAMPLE=? CY67 ABOVE NEXT OUTER DARKER ZONE

ELEM	OX	STRUCT	OXNO.=? -16
NA2O	7.79	1.307	
AL2O3	18.14	1.851	
SIO2	71.02	6.149	
K2O	.34	.037	
CAO	2.7	.25	
TOTAL	98.2	9.596	

CA: NA: K = 15.7 81.97 2.34

SAMPLE=? CY67 REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	8.36	1.44
AL2O3	24.11	2.525
SIO2	61.57	5.471
K2O	.54	.061
CAO	5.41	.515
TOTAL	99.4	10.015

CA: NA: K = 25.56 71.39 3.05

SAMPLE=? CY67 EDGE OF ABOVE XTAL

ELEM	OX	STRUCT	OXNO.=? -16
NA2O	9.09	1.56	
AL2O3	23.51	2.455	
SIO2	62.68	5.554	
K2O	.53	.059	
CAO	4.2	.398	
TOTAL	99.1	10.029	

CA: NA: K = 19.74 77.3 2.97

SAMPLE=? CY67PPLAG. OXNO.=? -16

ELEM	OX	STRUCT
NA2O	9.33	1.604
AL2O3	23.47	2.454
SIO2	62.46	5.542
K2O	.48	.054
CAO	4.27	.405
TOTAL	98.6	10.061

SAMPLE=? CY67 CPP. EDGE OF ABOVE

ELEM	OX	STRUCT	OXNO.=? -16
NA2O	7.75	1.339	
AL2O3	24.75	2.6	
SIO2	60.6	5.401	
K2O	.83	.094	
CAO	6.07	.579	
TOTAL	97.1	10.017	

CA: NA: K = 28.8 66.51 4.69

SAMPLE=? CY67 CENTRE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	8.49	1.464
AL2O3	24.73	2.593
SIO2	60.84	5.412
K2O	.31	.035
CAO	5.64	.537
TOTAL	97.5	10.044

CA: NA: K = 26.38 71.88 1.74

SAMPLE=? CY67 K.FELDS. PHENOCRYST

ELEM	OX	STRUCT	OXNO.=? -16
AL2O3	18.74	2.024	
SIO2	65.4	5.993	
K2O	14.64	1.711	
CAO	1.22	.119	
TOTAL	97.8	9.349	

CA: NA: K = 6.53 0 93.47

SAMPLE=? CY67 AMPHIBOLE OXNO.=? -16

ELEM	OX	STRUCT
MGO	14.36	3.048
AL2O3	5.4	.907
SIO2	52.32	7.451
K2O	.76	.137
CAO	11.49	1.752
MNO	.39	.046
FEO	15.28	1.82
TOTAL	95.9	15.165

CA: MG: FE = 26.47 46.04 27.49

CY67

SAMPLE=? CY67 ABOVE EDGE OXNO.=? -23

ELEM	OX	STRUCT
M		
GO	13.99	2.995
AL203	3.84	.649
SI02	52.37	7.518
K20	.49	.09
CA0	12.68	1.95
MNO	.41	.05
FEO	16.21	1.946
TOTAL	94.4	15.2

CA: MG: FE = 28.3 43.46 28.24

Sample=? REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na20	1.66	.296
Al203	18.64	2.024
Si02	63.94	5.89
K20	13.95	1.64
CaO	.87	.086
TiO2	.93	.064
Total	100.29	10.0009

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.25 14.64 81.11

AFM Ratio = 100

Sample=? CY67 PLAGIOCLASE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na20	6.99	1.202
Al203	24.84	2.595
Si02	61.46	5.446
K20	.5	.057
CaO	6.18	.587
Total	101.66	9.8857

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 31.8 65.11 3.09

AFM Ratio = 100

Sample=? CY67 ANOTHER PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na20	7.01	1.201
Al203	24.79	2.581
Si02	61.97	5.474
K20	.26	.029
CaO	5.96	.564
Total	100.69	9.85

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 31.44 66.95 1.62

AFM Ratio = 100

Sample=? CY67 ANOTHER PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na20	7.48	1.28
Al203	24.29	2.527
Si02	62.68	5.531
K20	.29	.033
CaO	5.2	.492
Total	102.07	9.8624

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 27.26 70.91 1.83

AFM Ratio = 100

Sample=? CY67 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na20	7.92	1.353
MgO	.4	.053
Al203	23.21	2.412
Si02	63.77	5.623
K20	.51	.058
CaO	3.5	.33
FeO	.64	.047
Total	101.53	9.8765
Mg/Mg+Fe=		53

Ca: Mg: Fe = 76.74 12.33 10.93

Ca: Na: K = 18.95 77.71 3.33

AFM Ratio = 92.34

Sample=? SAME

ELEM	OX	STRUCT
Na20	.61	.043
MgO	16.01	.868
Al203	5.31	.228
Si02	51.98	1.89
CaO	20.97	.817
TiO2	.36	.01
Cr203	.71	.021
FeO	4.04	.123
Total	100.63	3.9979
Mg/Mg+Fe=		87.59
Mg/Mg+Fe=		87.59

Sample=? CY67 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na20	7.8	1.331
Al203	23.1	2.397
Si02	64.39	5.67
K20	.37	.041
CaO	3.99	.377
Total	100.81	9.8172

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 21.56 76.1 2.34

AFM Ratio = 100

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na20	7.55	1.292
Al203	24.08	2.504
Si02	62.88	5.547
K20	.3	.034
CaO	5.15	.487
Total	102.6	9.8639

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 26.86 71.26 1.88

AFM Ratio = 100

Sample=? CY67 AGAIN ANOTHER GRAIN OXNO.=? -16

ELEM	OX	STRUCT
Na20	1.73	.31
Al203	18.96	2.062
Si02	63.21	5.831
K20	13.81	1.626
CaO	.99	.098
TiO2	1.29	.089
Total	99.39	10.0165

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.82 15.24 79.94

AFM Ratio = 100

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na20	6.9	1.183
Al203	25.1	2.616
Si02	61.78	5.463
K20	.56	.064
CaO	5.57	.528
Total	99.18	9.8527

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 29.75 66.65 3.61

AFM Ratio = 100

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na20	6.98	1.199
Al203	24.51	2.559
Si02	61.73	5.469
K20	.55	.062
CaO	5.96	.566
TiO2	.2	.013
Total	98.53	9.8681

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 30.98 65.63 3.39

AFM Ratio = 100

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na20	7.5	1.283
Al203	23.77	2.474
Si02	63.23	5.582
K20	.69	.077
CaO	4.71	.445
Total	97.09	9.8616

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 24.65 71.08 4.27

Sample=? CY67 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na20	2.22	.376
Al203	13.51	1.393
Si02	75.3	6.586
K20	7.48	.835
CaO	1.14	.107
FeO	.36	.026
Total	99.73	9.3224
Mg/Mg+Fe=		0

Ca: Mg: Fe = 80.45 0 19.55

Ca: Na: K = 8.12 28.53 63.35

AFM Ratio = 96.4

CY67, 69, 70

Sample=? CY67 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.51	.037
MgO	13.94	.781
Al2O3	4.33	.192
SiO2	51.19	1.925
K2O	.43	.021
CaO	11.97	.482
TiO2	.81	.023
FeO	16.66	.524
Total	98.7	3.9851
Mg/Mg+Fe=		59.85
Ca: Mg: Fe =	26.97	43.7 29.32
Ca: Na: K =	89.26	6.85 3.89
AFM Ratio =	6.85	

Sample=? CY67 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.91	.34
Al2O3	18.91	2.051
SiO2	63.63	5.855
K2O	13.46	1.58
CaO	.93	.092
TiO2	1.16	.08
Total	98.89	9.9992
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	4.57	16.9 78.53
AFM Ratio =	100	

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na2O	6.8	1.166
Al2O3	25.04	2.61
SiO2	61.77	5.463
K2O	.64	.072
CaO	5.7	.54
Total	100.41	9.8511
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	30.37	65.58 4.05
AFM Ratio =	100	

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na2O	8.55	1.457
Al2O3	22.55	2.336
SiO2	65.13	5.725
K2O	.4	.045
CaO	3.11	.293
Total	100.39	9.8576
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	16.32	81.17 2.51
AFM Ratio =	100	

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na2O	6.64	1.143
Al2O3	25.16	2.634
SiO2	60.83	5.403
K2O	.72	.081
CaO	6.62	.63
Total	101.6	9.8921
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	33.98	61.65 4.37
AFM Ratio =	100	

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na2O	6.94	1.193
Al2O3	25.07	2.621
SiO2	61.13	5.422
K2O	.35	.039
CaO	6.41	.609
Total	100.81	9.884
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	33.08	64.8 2.12
AFM Ratio =	100	

Sample=? CY67 ANOTHER

ELEM	OX	STRUCT
Na2O	6.6	1.137
Al2O3	25.17	2.637
SiO2	60.73	5.396
K2O	.69	.078
CaO	6.77	.644
Total	102.71	9.8932
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	34.64	61.16 4.2
AFM Ratio =	100	

Sample=? cy69

ELEM	OX	STRUCT
Na2O	5.77	.998
Al2O3	25.76	2.709
SiO2	59.71	5.328
K2O	.93	.106
CaO	7.6	.727
Total	100.36	9.8689
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	39.71	54.51 5.79
AFM Ratio =	100	

Sample=? 71-311 exsolved feldspar OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.32	1.095
Al2O3	18.22	1.919
SiO2	67.86	6.062
K2O	7	.798
CaO	.3	.029
FeO	.3	.022
Total	100.08	9.925
Mg/Mg+Fe=		0
Ca: Mg: Fe =	56.86	0 43.14
Ca: Na: K =	1.51	56.97 41.52
AFM Ratio =	97.76	

Sample=? cy69 exsolved feldspar OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.85	1.35
Al2O3	18.45	1.929
SiO2	68.33	6.059
K2O	4.53	.512
CaO	.26	.025
FeO	.45	.033
Total	99.83	9.9077
Mg/Mg+Fe=		0
Ca: Mg: Fe =	43.1	0 56.9
Ca: Na: K =	1.32	71.54 27.13
AFM Ratio =	96.69	

Sample=? cy69 adjacent feldspar OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.19	1.071
MgO	.49	.066
Al2O3	26.1	2.746
SiO2	58.93	5.258
K2O	.75	.086
CaO	7.54	.721
Total	102.36	9.9460
Mg/Mg+Fe=		100
Ca: Mg: Fe =	91.61	8.39 0
Ca: Na: K =	38.39	57.03 4.58
AFM Ratio =	95.41	

Sample=? CY70 PLAG. PHENOCRYST

ELEM	OX	STRUCT
Na2O	6.48	1.12
Al2O3	25.12	2.638
SiO2	60.53	5.392
K2O	.71	.081
CaO	6.91	.659
Total	101.15	9.8894
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	35.43	60.22 4.35
AFM Ratio =	100	

Sample=? CY70 K-FELDSPAR PHENOCRYST

ELEM	OX	STRUCT
Na2O	2	.356
Al2O3	18.56	2.006
SiO2	64.91	5.95
K2O	13.28	1.553
CaO	.89	.088
TiO2	.35	.024
Total	100.91	9.9773
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	4.41	17.83 77.77
AFM Ratio =	100	

Sample=? CY70 K-FELDSPAR PHENOCRYST

ELEM	OX	STRUCT
Na2O	2.29	.409
Al2O3	18.73	2.028
SiO2	64.04	5.883
K2O	13.08	1.533
CaO	.92	.091
TiO2	.94	.065
Total	103.51	10.009

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.48 20.12 75.41

AFM Ratio = 100

Sample=? CY70 INCLUSION IN ABOVE

ELEM	OX	STRUCT
Na2O	6.59	1.139
Al2O3	24.76	2.601
SiO2	60.68	5.407
K2O	.95	.108
CaO	6.91	.66
Total	102.11	9.9153

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 34.61 59.73 5.66

AFM Ratio = 100

Sample=? CY70 EDGE OF ABOVE SANIDINE PHENOCRYST

ELEM	OX	STRUCT
Na2O	2.08	.37
Al2O3	18.64	2.014
SiO2	64.87	5.945
K2O	13.21	1.545
CaO	.85	.084
TiO2	.35	.024
Total	104.05	9.9816

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.2 18.51 77.29

AFM Ratio = 100

Sample=? CY70 PLAG. PHENOCRYST

ELEM	OX	STRUCT
Na2O	7	1.201
Al2O3	23.75	2.478
SiO2	62.71	5.551
K2O	.95	.108
CaO	5.54	.526
Total	101.86	9.8643

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 28.66 65.45 5.89

AFM Ratio = 100

Sample=? CY70 EDGE K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.62	.286
Al2O3	17.82	1.915
SiO2	66.25	6.039
K2O	12.96	1.507
CaO	.79	.077
TiO2	.56	.038
Total	98.25	9.8625

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.12 15.29 80.59

AFM Ratio = 100

Sample=? CY70 EDGE OF PLAGIOCLASE

ELEM	OX	STRUCT
Na2O	6.64	1.146
Al2O3	25.51	2.858
SiO2	60.26	5.364
K2O	.69	.078
CaO	7.09	.676
Total	98.68	9.9199

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 35.58 60.32 4.11

AFM Ratio = 100

Sample=? CY70 CORE OF ABOVE CRYSTYAL

ELEM	OX	STRUCT
Na2O	6.02	1.042
Al2O3	25.98	2.733
SiO2	59.28	5.291
K2O	.6	.069
CaO	7.98	.763
Total	98.41	9.8981

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 40.72 55.6 3.68

AFM Ratio = 100

Sample=? CY70 EDGE ANOTHERB PLAGE

ELEM	OX	STRUCT
Na2O	6.69	1.154
Al2O3	24.5	2.569
SiO2	61.31	5.453
K2O	1.12	.128
CaO	6.29	.6
Total	99.98	9.7033

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 31.88 61.32 6.8

AFM Ratio = 100

Sample=? CY70 EDGE ANOTGER PLAG.

ELEM	OX	STRUCT
Na2O	7.42	1.273
Al2O3	23.15	2.414
SiO2	63.44	5.613
K2O	1.13	.128
CaO	4.76	.451
Total	97.08	9.8797

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 24.35 68.74 6.91

AFM Ratio = 100

Sample=? CY70 ANOTHER PLAG.

ELEM	OX	STRUCT
Na2O	7.05	1.211
Al2O3	23.99	2.504
SiO2	62.42	5.528
K2O	.9	.101
CaO	5.61	.532
Total	98.43	9.8759

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 28.85 65.67 5.48

AFM Ratio = 100

Sample=? CY70 ANOTHER PLAG.

ELEM	OX	STRUCT
Na2O	7.34	1.261
Al2O3	22.94	2.396
SiO2	63.53	5.629
K2O	1.2	.135
CaO	4.73	.449
Total	99.06	9.8707

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 24.34 68.35 7.32

AFM Ratio = 100

Sample=? CY70 ANOTHER

ELEM	OX	STRUCT
Na2O	6.9	1.192
MgO	.2	.027
Al2O3	24.8	2.604
SiO2	60.66	5.403
K2O	.79	.09
CaO	6.5	.62
Total	97.59	9.9357

Mg/Mg+Fe= 100

Ca: Mg: Fe = 95.83 4.17 0

Ca: Na: K = 32.6 62.67 4.73

AFM Ratio = 97.97

Sample=? CY70 K-FELDSPAR EDGE\

ELEM	OX	STRUCT
Na2O	1.88	.336
Al2O3	18.57	2.011
SiO2	64.55	5.931
K2O	13.54	1.588
CaO	1	.098
TiO2	.45	.031
Total	99.09	9.9942

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.85 16.62 78.54

AFM Ratio = 100

Sample=? CY70 ANOTHER EDGE

ELEM	OX	STRUCT
Na2O	1.92	.341
Al2O3	18.75	2.025
SiO2	64.49	5.908
K2O	13.05	1.525
CaO	.83	.081
TiO2	.96	.066
Total	98.79	9.9467

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.16 17.51 78.33

AFM Ratio = 100

Sample=? CY70 PLAG. CRYSTAL

ELEM	OX	STRUCT
Na2O	6.65	1.148
Al2O3	25.11	2.637
SiO2	60.46	5.385
K2O	.68	.077
CaO	6.94	.662
Total	99.17	9.9094

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 35.08 60.84 4.08
AFM Ratio = 100

Sample=? CY70 EDGE K-FELDSPAR

ELEM	OX	STRUCT
Na2O	2.13	.379
Al2O3	18.81	2.032
SiO2	64.38	5.9
K2O	12.95	1.514
CaO	.83	.081
TiO2	.9	.062
Total	98.3	9.9686

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.1 19.2 76.7
AFM Ratio = 100

Sample=? CY70 EDGE OF CRYSTAL

ELEM	OX	STRUCT
Na2O	6.43	1.111
MgO	.22	.029
Al2O3	25.61	2.691
SiO2	59.64	5.318
K2O	.65	.073
CaO	7.38	.705
Total	98.29	9.9286

Mg/Mg+Fe= 100
Ca: Mg: Fe = 96.05 3.95 0
Ca: Na: K = 37.32 58.81 3.86
AFM Ratio = 97.89

Sample=? CY70 ANOTHER EDGE OF ABOVE K-FELDSPAR CRYSTAL

ELEM	OX	STRUCT
Na2O	2.04	.363
Al2O3	18.86	2.035
SiO2	64.62	5.916
K2O	13	1.519
CaO	.74	.073
TiO2	.73	.05
Total	98.88	9.9567

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.73 18.57 77.7
AFM Ratio = 100

Sample=? CY70 EDGE PLAG.

ELEM	OX	STRUCT
Na2O	6.57	1.134
Al2O3	25.24	2.651
SiO2	60.34	5.376
K2O	.73	.084
CaO	6.94	.662
Total	99.15	9.9072

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 35.21 60.32 4.47
AFM Ratio = 100

Sample=? CY70 EDGE OF PLAG.

ELEM	OX	STRUCT
Na2O	6.87	1.182
Al2O3	24.5	2.564
SiO2	61.59	5.467
K2O	.79	.09
CaO	6.15	.585
Total	98.26	9.887

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 31.5 63.65 4.85
AFM Ratio = 100

Sample=? CY70 CORE OF ABOVE CRYSTAL

ELEM	OX	STRUCT
Na2O	6.46	1.115
Al2O3	25.45	2.669
SiO2	60.28	5.363
K2O	.67	.076
CaO	7.08	.675
Total	98.47	9.8983

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 36.17 59.75 4.07
AFM Ratio = 100

Sample=? CY70 EDGE ANOTHRER PLAG.

ELEM	OX	STRUCT
Na2O	6.87	1.181
Al2O3	24.26	2.535
SiO2	62.07	5.502
K2O	.82	.092
CaO	5.87	.558
Total	97.72	9.8678

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 30.48 64.5 5.02
AFM Ratio = 100

Sample=? CY70 EDGE PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.82	1.17
Al2O3	24.33	2.539
SiO2	62.09	5.498
K2O	.88	.099
CaO	5.9	.56
Total	101.09	9.8867

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 30.62 63.97 5.41
AFM Ratio = 100

Sample=? CY70 ANOTHER PLAG.

ELEM	OX	STRUCT
Na2O	6.8	1.172
Al2O3	24.83	2.602
SiO2	61.03	5.425
K2O	.76	.087
CaO	6.5	.619
Total	102.17	9.9038

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 32.96 62.41 4.63
AFM Ratio = 100

Sample=? CY70 ANOTHER PLAG. EDGE

ELEM	OX	STRUCT
Na2O	6.55	1.127
Al2O3	24.89	2.604
SiO2	61.18	5.429
K2O	.68	.077
CaO	6.66	.634
Total	100.4	9.8703

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 34.49 61.32 4.19
AFM Ratio = 100

Sample=? CY70 ANOTHER PLAG.

ELEM	OX	STRUCT
Na2O	6.77	1.163
Al2O3	24.48	2.557
SiO2	61.84	5.48
K2O	.79	.089
CaO	6.09	.579
Total	101.86	9.8679

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 31.62 63.52 4.86
AFM Ratio = 100

Sample=? CY70 ANOTHER PLAG. EDGE

ELEM	OX	STRUCT
Na2O	6.54	1.127
Al2O3	24.96	2.614
SiO2	61.01	5.42
K2O	.74	.084
CaO	6.66	.634
Total	101.23	9.8785

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 34.36 61.08 4.55
AFM Ratio = 100

Sample=? CY70 ANOTHER EDGE

ELEM	OX	STRUCT
Na2O	7.03	1.207
Al2O3	23.86	2.491
SiO2	62.64	5.548
K2O	.97	.109
CaO	5.36	.509
Total	101.21	9.8642

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 27.89 66.14 5.97
AFM Ratio = 100

Sample=? CY70 K-FELDSPAR EDGE

ELEM	OX	STRUCT
Na2O	5.17	1.115
Al2O3	24.54	2.962
SiO2	61.8	5.474
K2O	.74	.084
CaO	6.93	.51
Total	102.42	9.8448

Ca: Ms: Fe = 100 0 0
Ca: Na: K = 36.72 61.64 1.64
AFM Ratio = 100

Sample=? CY70 ANOTHER FELD. EDGE??

ELEM	OX	STRUCT
Na2O	7.21	1.231
Al2O3	22.91	2.679
SiO2	64.36	5.668
K2O	1.12	.125
CaO	4.42	.417
Total	101.37	9.8205

Ca: Ms: Fe = 100 0 0
Ca: Na: K = 23.52 69.43 7.05
AFM Ratio = 100

Sample=? CY70 CORE OF PLAGIOCLAS

ELEM	OX	STRUCT
Na2O	4.69	.817
Al2O3	28.08	2.972
SiO2	56.16	5.042
K2O	.34	.039
CaO	10.72	1.031
Total	102.97	9.9002

Ca: Ms: Fe = 100 0 0
Ca: Na: K = 54.64 43.3 2.07
AFM Ratio = 100

Sample=? CY70K-FELDSPAR

ELEM	OX	STRUCT
Na2O	.42	.076
Al2O3	17.82	1.943
SiO2	64.95	6.009
K2O	13.65	1.611
CaO	.96	.095
Total	103.89	9.9529

Ca: Ms: Fe = 100 0 0
Ca: Na: K = 4.65 3.72 91.63
AFM Ratio = 100

Sample=? CY70 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	6.43	1.106
Al2O3	24.73	2.991
SiO2	61.36	5.442
K2O	.78	.088
CaO	6.67	.634
Total	102.83	9.8588

Ca: Ms: Fe = 100 0 0
Ca: Na: K = 54.72 30.57 4.71
AFM Ratio = 100

Sample=? CY71 CORE OF ANOTHER CRYSTAL

ELEM	OX	STRUCT
Na2O	5.59	.964
MsO	.52	.069
Al2O3	25.95	2.72
SiO2	59.61	5.301
K2O	.71	.08
CaO	7.62	.726
Total	103.25	9.8603

Ms/Ms+Fe= 100
Ca: Ms: Fe = 91.32 8.68 0
Ca: Na: K = 41.02 54.46 4.52
AFM Ratio = 95.17

Sample=? CY71 RIM ROUND ABOVE

ELEM	OX	STRUCT
Na2O	6.76	1.164
MsO	.56	.076
Al2O3	23.95	2.505
SiO2	61.74	5.48
K2O	.59	.067
CaO	5.67	.539
FeO	.73	.054
Total	102.77	9.8825

Ms/Ms+Fe= 57.81
Ca: Ms: Fe = 80.81 11.09 8.1
Ca: Na: K = 30.45 65.76 3.79
AFM Ratio = 90.73

Sample=? CY71 CORE OF ANOTHER FELDSPAR

ELEM	OX	STRUCT
Na2O	4.82	.835
MsO	.29	.039
Al2O3	26.11	2.747
SiO2	58.96	5.263
K2O	1.08	.123
CaO	8.74	.836
Total	98.32	9.8422

Ms/Ms+Fe= 100
Ca: Ms: Fe = 95.54 4.46 0
Ca: Na: K = 46.6 46.54 6.86
AFM Ratio = 97.24

Sample=? CY-73 OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.06	.192
Al2O3	17.71	1.944
SiO2	63.79	5.942
K2O	15.31	1.819
CaO	1.33	.133
FeO	.81	.063
TOTAL	98.21	10.093

MG/MG+FE= 0

CA: MG: FE = 67.86 0 32.14

CA: NA: K = 6.2 8.96 84.84

Sample=? CY73 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.97	.149
MgO	7.46	.433
Al2O3	4.06	.187
SiO2	48.32	1.883
CaO	20.29	.847
TiO2	.65	.019
MnO	.71	.023
FeO	16.54	.539
TOTAL	102.26	4.08

CA: NA: K = 85.04 14.96 0

Sample=? CY73 MELANITE OXNO.=? -24

ELEM	OX	STRUCT
MgO	.46	.12
Al2O3	4.42	.901
SiO2	35.06	6.063
CaO	31.62	5.86
TiO2	3.6	.469
Cr2O3	.25	.034
MnO	1.1	.161
FeO	23.49	3.398
TOTAL	101.88	17.006

CA: NA: K = 100 0 0

Sample=? CY73 MELANITE OXNO.=? -24

ELEM	OX	STRUCT
MgO	.45	.115
Al2O3	4.4	.895
SiO2	35.51	6.121
CaO	31.83	5.879
TiO2	3.55	.461
MnO	1.06	.155
FeO	23.18	3.342
TOTAL	99.66	16.968

CA: NA: K = 100 0 0

Sample=? CY73 K-SODALITE? OXNO.=? -24

ELEM	OX	STRUCT
Na2O	15.52	4.28
Al2O3	27.72	4.648
SiO2	49.97	7.109
K2O	5.67	1.03
CaO	.69	.105
FeO	.42	.051
TOTAL	98.57	17.223

CA: NA: K = 1.94 79.04 19.02

Sample=? CY73 SANIDINE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.89	.336
Al2O3	19.01	2.059
SiO2	63.83	5.866
K2O	13.27	1.556
CaO	1.09	.107
TiO2	.88	.061
TOTAL	101.9	9.98499

CA: NA: K = 5.35 16.81 77.84

Sample=? CY73 AS ABOVE ANOTHER SPOT OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.4	.073
Al2O3	18.71	2.048
SiO2	62.64	5.819
K2O	15.53	1.84
CaO	1.2	.12
TiO2	1.52	.106
TOTAL	101.05	10.006

CA: NA: K = 5.9 3.59 90.51

Sample=? CY73PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.36	.104
MgO	7.2	.421
Al2O3	6.69	.309
SiO2	44.97	1.765
CaO	21.11	.888
TiO2	1.22	.036
MnO	.67	.022
FeO	16.78	.551
TOTAL	103.78	4.096

CA: NA: K = 89.52 10.48 0

Sample=? CY73 FELDSPATHOID? OXNO.=? -24

ELEM	OX	STRUCT
Na2O	11.77	3.207
Al2O3	23.28	3.857
SiO2	52.6	7.394
K2O	.59	.106
CaO	11.78	1.774
TOTAL	85.41	16.338

CA: NA: K = 34.87 63.04 2.08

Sample=? CY73 LATH OF AEGERINE? OXNO.=? -6

ELEM	OX	STRUCT
Na2O	11.36	.88
MgO	.9	.053
Al2O3	2.23	.105
SiO2	51.3	2.048
CaO	4.48	.192
TiO2	2.55	.077
MnO	.75	.025
FeO	26.42	.882
TOTAL	103.27	4.262

CA: NA: K = 17.91 82.09 0

Sample=? CY73SANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.43	.078
Al2O3	18.8	2.055
SiO2	63.19	5.859
K2O	15.49	1.832
CaO	1.13	.113
TiO2	.95	.066
TOTAL	105.27	10.003

CA: NA: K = 5.59 3.86 90.56

Sample=? CY73 FELDSPAR? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.09	1.89
MgO	.45	.059
Al2O3	27	2.797
SiO2	61.44	5.399
TOTAL	108.37	10.145

Sample=? CY73 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	3.41	.26
MgO	7	.41
Al2O3	5.42	.251
SiO2	46.46	1.826
K2O	.47	.024
CaO	17.66	.743
TiO2	1.28	.038
MnO	.58	.019
FeO	17.7	.582
TOTAL	103.87	4.153

MG/MG+FE= 41.33

CA: MG: FE = 42.82 23.63 33.54

CA: NA: K = 72.35 25.32 2.34

Sample=? CY73 MELANITE OXNO.=? -24

ELEM	OX	STRUCT
MgO	.51	.134
Al2O3	2.42	.499
SiO2	34.44	6.026
CaO	32.1	6.017
TiO2	4.97	.654
MnO	.89	.132
FeO	24.67	3.61
TOTAL	99.66	17.072

MG/MG+FE= 3.58

CA: MG: FE = 61.64 1.37 36.98

Sample=? CY73 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.67	.203
MgO	6.6	.386
Al2O3	3.46	.16
SiO2	48.52	1.905
CaO	19.09	.803
TiO2	.52	.015
MnO	.89	.03
FeO	18.28	.6
TOTAL	102.21	4.102

MG/MG+FE= 39.15

CA: MG: FE = 44.89 21.58 33.54

CA: NA: K = 79.82 20.18 0

Sample=? CY73 ANALCITE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	15.22	2.65
Al2O3	26.45	2.8
SiO2	58.31	5.237
TOTAL	94.17	10.687

Sample=? CY73 ANALCITE ??? ANOTHER PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	18.28	3.245
MgO	.36	.05
Al2O3	25.34	2.735
SiO2	55.77	5.106
K2O	.27	.031
TOTAL	92.31	11.167

CA: NA: K = 0 99.05 .95

Sample=? CY73 ANALCITE ??? AGAIN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	21.66	3.915
MgO	.76	.106
Al2O3	24.24	2.663
SiO2	53.33	4.13W
	TOTAL 118.96	11.654

CA: NA: K = 0 100 0

Sample=? FELDSPATHOID

ELEM	OX	STRUCT
Na2O	18.64	5.282
Al2O3	32.52	5.601
SiO2	40.03	5.85
K2O	1.49	.278
CaO	6.96	1.089
FeO	.25	.03
Total	78.69	18.1302

Mg/Mg+Fe= 0

Ca: Mg: Fe = 97.32 0 2.68

Ca: Na: K = 16.38 79.44 4.18

AFM Ratio = 98.94

Sample=? CY73 EDGEOF ABOVE

ELEM	OX	STRUCT
Na2O	18.04	5.231
Al2O3	31.37	5.53
SiO2	38.68	5.785
K2O	5.82	1.11
CaO	6.03	.966
Total	82.22	18.6206

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 13.22 71.59 15.19

AFM Ratio = 100

Sample=? CY73 SMALL FELDSPAR CRYSTAL OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.31	1.899
Al2O3	22.87	2.559
SiO2	50.63	4.807
K2O	1.21	.146
CaO	14.98	1.524
Total	73.26	10.936

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 42.7 53.21 4.09

AFM Ratio = 100

Sample=? CY73 ANALCITE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	13.16	.85
Al2O3	26.27	1.032
SiO2	60.37	2.011
K2O	.21	.009
Total	89.11	3.9021

Ca: Na: K = 0 98.95 1.05

AFM Ratio = 100

Sample=? CY73 SCAPOLITE OXNO.=? -24

ELEM	OX	STRUCT
Na2O	18.12	5.255
Al2O3	31.57	5.564
SiO2	38.69	5.787
K2O	6.31	1.203
CaO	5.31	.851
Total	84.33	18.66

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 11.64 71.9 16.46

AFM Ratio = 100

Sample=? CY73 ANOTHER SCAPOLITE

ELEM	OX	STRUCT
Na2O	17.25	5.07
Al2O3	30.17	5.39
SiO2	37.21	5.639
K2O	6	1.16
CaO	9.37	1.522
Total	84.03	18.7802

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 19.63 65.4 14.96

AFM Ratio = 100

Sample=? CY73 SCAPOLITE

ELEM	OX	STRUCT
Na2O	17.2	4.974
Al2O3	30.91	5.434
SiO2	39.73	5.926
K2O	6.67	1.27
CaO	5.47	.874
Total	81.42	18.4787

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 12.28 69.88 17.84

AFM Ratio = 100

Sample=? CY73 SCAPOLITE AGAIN

ELEM	OX	STRUCT
Na2O	16.17	4.886
Al2O3	28.25	5.19
SiO2	34.21	5.331
K2O	6.42	1.277
CaO	14.81	2.473
Total	83.25	19.1558

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 28.64 56.58 14.79

AFM Ratio = 100

Sample=? CY73 LOW S SCAPOLITE

ELEM	OX	STRUCT
Na2O	11.87	3.113
Al2O3	25.61	4.085
SiO2	58.04	7.854
K2O	.27	.047
CaO	4.04	.586
Total	85	15.6842

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 15.64 83.1 1.25

AFM Ratio = 100

Sample=? CY73 GREEN PYROXENE// OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.53	.117
MgO	6.71	.395
Al2O3	5.83	.272
SiO2	45.39	1.794
CaO	21.04	.891
TiO2	.83	.025
MnO	.62	.021
FeO	17.79	.588
Total	104.89	4.1037

Mg/Mg+Fe= 40.18

Ca: Mg: Fe = 47.55 21.08 31.38

Ca: Na: K = 88.39 11.61 0

AFM Ratio = 12.15

Sample=? CY73 SCAPOLITE OXNO.=? -24

ELEM	OX	STRUCT
Na2O	17.82	5.172
Al2O3	31.63	5.579
SiO2	38.81	5.809
K2O	7	1.337
CaO	4.74	.759
Total	84.49	18.6563

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 10.44 71.16 18.4

AFM Ratio = 100

Sample=? CY74

ELEM	OX	STRUCT
Na2O	1.35	.24
Al2O3	19.25	2.083
SiO2	63.77	5.853
K2O	13.34	1.562
CaO	.82	.081
TiO2	1.23	.085
FeO	.24	.018
Total	98.35	9.922

Mg/Mg+Fe= 0

Ca: Mg: Fe = 81.82 0 18.18

Ca: Na: K = 4.3 12.75 82.95

AFM Ratio = 98.3

Sample=? CY74 CORE

ELEM	OX	STRUCT
Na2O	1.18	.209
Al2O3	19.38	2.089
SiO2	64.02	5.855
K2O	13.09	1.527
CaO	.84	.082
TiO2	1.5	.103
Total	99.53	9.8656

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.51 11.5 83.99

AFM Ratio = 100

Sample=? CY74 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	1.35	.239
MgO	.28	.038
Al2O3	19.14	2.066
SiO2	63.91	5.854
K2O	13.15	1.537
CaO	.81	.079
TiO2	1.36	.094
Total	100.88	9.9073

Mg/Mg+Fe= 100

Ca: Mg: Fe = 67.52 32.48 0

Ca: Na: K = 4.26 12.88 82.86

AFM Ratio = 96.45

Sample=? CY74 CORE OF ABOVE AGAIN

ELEM	OX	STRUCT
Na2O	1.2	.213
Al2O3	19.19	2.07
SiO2	64.16	5.872
K2O	13.24	1.546
CaO	.83	.081
TiO2	1.38	.095
Total	99.25	9.8771

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.4 11.58 84.02

AFM Ratio = 100

Sample=? CY74 CORE OF ABOVE

ELEM	OX	STRUCT
Na2O	1.16	.207
Al2O3	18.73	2.025
SiO2	64.48	5.913
K2O	13.71	1.604
CaO	.79	.078
TiO2	1.11	.077
Total	99.84	9.9037

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.13 10.96 84.91

AFM Ratio = 100

Sample=? CY74 ANOTHER PART OF ABOVE CORE

ELEM	OX	STRUCT
Na2O	1.34	.238
Al2O3	19.17	2.068
SiO2	64.05	5.863
K2O	13.17	1.538
CaO	.73	.072
TiO2	1.54	.106
Total	99.75	9.8854

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.9 12.88 83.23

AFM Ratio = 100

Sample=? CY74 INC. WITHIN MAGNETITE

ELEM	OX	STRUCT
Na2O	16.08	1.236
MgO	.3	.017
Al2O3	26.9	1.224
SiO2	56.93	2.256
FeO	.5	.016
TOTAL	90.88	4.7495

Mg/Mg+Fe= 51.52

Ca: Mg: Fe = 0 51.52 48

Ca: Na: K = 0 100 0

AFM Ratio = 96.96

Sample=? CY74 PYROXENE [illegible]

ELEM	OX	STRUCT
Na2O	1.69	.122
MgO	7.79	.458
Al2O3	3.11	.181
SiO2	46.75	1.846
CaO	23.23	.983
TiO2	.39	.017
MnO	.39	.013
FeO	16.69	.554
TOTAL	100.48	4.174

Mg/Mg+Fe= [illegible]

Ca: Mg: Fe = 49.55 22.99 27.46

Ca: Na: K = 88.4 11.6 0

AFM Ratio = 6.7

Sample=? CY74 MAGNETITE [illegible]

ELEM	OX	STRUCT
MgO	.6	.043
Al2O3	1.58	.079
TiO2	3.87	.177
MnO	.97	.034
FeO	90.39	2.939
TOTAL	97.4	3.6425

Mg/Mg+Fe= 2.17

Ca: Mg: Fe = 0 2.17 97.83

AFM Ratio = 1.2

Trace Elements? 9

$? 1 0-0-0

Sample=? CY74 [illegible]

ELEM	OX	STRUCT
Na2O	15.63	4.79
MgO	.54	.035
Al2O3	30.01	5.431
SiO2	49.47	5.459
K2O	.28	.013
CaO	3.47	.421
TOTAL	99.47	17.9477

Mg/Mg+Fe= 100

Ca: Mg: Fe = 82.91 17.09 0

Ca: Na: K = 11.34 87.6 1.04

AFM Ratio = 99.57

Sample=? CY74 [illegible]

BOTH ALSO HAVE SOLOMON [illegible]

ELEM	OX	STRUCT
Na2O	14.57	4.613
MgO	.6	.145
Al2O3	29.42	5.665
SiO2	38.32	6.257
K2O	.33	.07
CaO	2.89	.506
TOTAL	86.13	17.256

Mg/Mg+Fe= 100

Ca: Mg: Fe = 77.73 22.27 0

Ca: Na: K = 9.75 88.9 1.35

AFM Ratio = 95.13

Sample=? CY74 CORE OF FELDSPAR CRYSTAL

ELEM	OX	STRUCT
Na2O	2.06	.36
Al2O3	19.59	2.085
SiO2	64.97	5.866
K2O	13.3	1.532
TiO2	1.43	.097
TOTAL	101.35	9.9403

Ca: Na: K = 0 19.03 80.97

AFM Ratio = 100

Sample=? CY74 INCLUSION? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.47	.263
Al2O3	18.39	1.999
SiO2	64.52	5.952
K2O	14.31	1.684
CaO	1.06	.105
FeO	.27	.021
TOTAL	102.14	10.024

MG/MG+FE= 0
CA: MG: FE = 83.33 0 16.67
CA: NA: K = 5.12 12.82 82.07

Sample=? CY74K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.94	.348
Al2O3	18.08	1.97
SiO2	64.43	5.955
K2O	14.29	1.684
CaO	1.01	.1
FeO	.23	.018
TOTAL	103	10.075

MG/MG+FE= 0
CA: MG: FE = 84.75 0 15.25
CA: NA: K = 4.69 16.32 78.99

Sample=? CY74 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.15	.206
Al2O3	18.33	2.004
SiO2	63.96	5.933
K2O	15.29	1.809
CaO	1.11	.11
FeO	.19	.015
TOTAL	100.54	10.077

MG/MG+FE= 0
CA: MG: FE = 88 0 12
CA: NA: K = 5.18 9.69 85.13

Sample=? CY74 ISOTROPIC BASE OF INCIIUSION

ELEM	OX	STRUCT
Na2O	18.18	3.243
MgO	.2	.027
Al2O3	26.32	2.854
SiO2	54.38	5.001
K2O	.28	.033
CaO	.15	.015
MnO	.17	.013
FeO	.32	.025
TOTAL	92.85	11.211

OXNO.=? -16
MG/MG+FE= 51.92
CA: MG: FE = 22.39 40.3 37.31
CA: NA: K = .46 98.54 1

Sample=? CY74 PYROXENE? IN INCLUSION

ELEM	OX	STRUCT
Na2O	1.24	.095
MgO	7.61	.446
Al2O3	3.63	.168
SiO2	46.93	1.846
CaO	22.18	.935
TiO2	.77	.023
MnO	.79	.026
FeO	16.85	.554
TOTAL	97.76	4.093

OXNO.=? -6
MG/MG+FE= 44.6
CA: MG: FE = 48.32 23.05 28.63
CA: NA: K = 90.78 9.22 0

Sample=? CY74 SMALL SANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2	.357
Al2O3	17.88	1.947
SiO2	64.65	5.974
K2O	14.38	1.696
CaO	.91	.09
FeO	.19	.015
TOTAL	101.51	10.079

MG/MG+FE= 0
CA: MG: FE = 85.71 0 14.29
CA: NA: K = 4.2 16.66 79.14

Sample=? CY74 ANALCITE

ELEM	OX	STRUCT
Na2O	17.25	1.142
Al2O3	27.02	1.088
SiO2	55.59	1.899
Total	94.8	4.1287

Ca: Na: K = 0 100 0
AFM Ratio = 100

Sample=? CY74 GLASSY MATERIAL ANALCITI OXNO.=? -6

ELEM	OX	STRUCT
Na2O	16.75	1.108
Al2O3	27.47	1.104
SiO2	55.48	1.892
K2O	.22	.01
Total	93.32	4.1143

Ca: Na: K = 0 99.11 .89
AFM Ratio = 100

Sample=? CY74 SULPHUR BEARING MINERAL OXNO.=? -10

ELEM	OX	STRUCT
Na2O	20.25	2.37
Al2O3	32.8	2.334
SiO2	42.52	2.567
K2O	4.06	.313
CaO	.37	.024
Total	82.58	7.6075

Ca: Mg: Fe = 100 0 0
Ca: Na: K = .89 87.55 11.56
AFM Ratio = 100

Sample=? CY74 CORE ANORTHOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.27	.226
Al2O3	19.25	2.087
SiO2	63.64	5.853
K2O	13.85	1.625
CaO	.91	.089
TiO2	1.08	.075
Total	97.26	9.9547

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.59 11.65 83.76
AFM Ratio = 100

Sample=? CY74 SAME FURTHER OUT

ELEM	OX	STRUCT
Na2O	1.26	.226
Al2O3	19.33	2.098
SiO2	63.12	5.813
K2O	13.87	1.629
CaO	.89	.088
TiO2	1.53	.196
Total	97.48	9.96

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.53 11.63 83.84
AFM Ratio = 100

Sample=? CY74 SAME FURTHER OUT

ELEM	OX	STRUCT
Na2O	1.69	.301
Al2O3	18.67	2.021
SiO2	64.93	5.962
K2O	13.93	1.632
CaO	.79	.078
Total	98.94	9.9933

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.88 14.97 81.15
AFM Ratio = 100

Sample=? CY74 SAME FURTHER OUT

ELEM	OX	STRUCT
Na2O	1.97	.351
Al2O3	18.69	2.022
SiO2	64.95	5.959
K2O	13.59	1.591
CaO	.8	.079
Total	99.69	10.0009

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.91 17.37 78.72
AFM Ratio = 100

Sample=? CY74 OUTER EDGE\

ELEM	OX	STRUCT
Na2O	2.04	.362
Al2O3	18.68	2.02
SiO2	64.93	5.958
K2O	13.52	1.582
CaO	.84	.083
Total	99.54	10.0049

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.09 17.86 78.05
AFM Ratio = 100

Sample=? CY74 K-FELDSPAR INTERGROWN WITH ABOVE

ELEM	OX	STRUCT
Na2O	3.05	.529
Al2O3	18.42	1.945
SiO2	67.05	6.009
K2O	13.57	1.551
FeO	.31	.023
TOTAL	102.39	10.0585
Mg/Mg+Fe=		0

Ca: Mg: Fe = 0 0 100
Ca: Na: K = 0 25.43 74.57
AFM Ratio = 97.69

Sample=? CY74 FIBROUS ANISOTROPIC MINERAL

ELEM	OX	STRUCT
Na2O	20.46	5.696
MgO	.39	.093
Al2O3	34.06	5.763
SiO2	41.39	5.942
K2O	.47	.086
CaO	3.23	.496
TOTAL	74.97	18.067
Mg/Mg+Fe=		100

Ca: Mg: Fe = 85.66 14.34 0
Ca: Na: K = 7.9 90.73 1.37
AFM Ratio = 97.2

Sample=? CY74 AEGIRINE? OXNO.=? -6

ELEM	OX	STRUCT
Na2O	11.46	.885
MgO	.68	.04
Al2O3	2.36	.111
SiO2	51.5A	2.053
K2O	.74	.037
CaO	5.19	.222
TiO2	2.66	.08
MnO	.65	.022
FeO	24.69	.822
TOTAL	97.73	4.2727
Mg/Mg+Fe=		4.64

Ca: Mg: Fe = 20.48 3.69 75.83
Ca: Na: K = 19.41 77.36 3.23
AFM Ratio = 6.05

Sample=? CY74 CLEARER ZONE ABOUT ABOVE OXNO.=? -24

ELEM	OX	STRUCT
MgO	.33	.084
Al2O3	3.94	.801
SiO2	35.04	6.042
CaO	42.23	7.954
TiO2	4.97	.644
MnO	.69	.101
FeO	22.81	3.269
TOTAL	93.4	16.9135
Mg/Mg+Fe=		2.49

Ca: Mg: Fe = 43.84 .9 35.26
Ca: Na: K = 100 0 0
AFM Ratio = 10.61

Sample=? CY74 NEXT OUTER LAYER

ELEM	OX	STRUCT
Al2O3	3.97	.81
SiO2	34.76	6.017
CaO	32.45	6.015
TiO2	4.84	.629
MnO	.72	.106
FeO	23.27	3.369
TOTAL	93.24	16.9489
Mg/Mg+Fe=		0

Ca: Mg: Fe = 64.11 0 35.89
Ca: Na: K = 100 0 0
AFM Ratio = 10.73

Sample=? CY74 REACTION RIM? AROUND NELANITE OXNO.='10

ELEM	OX	STRUCT
Na2O	4.22	.631
MgO	1.81	.208
Al2O3	13.55	1.23
SiO2	36.59	2.819
K2O	2.39	.234
CaO	7.6	.628
TiO2	2.62	.152
MnO	.57	.037
FeO	14.1	.908
TOTAL	83.44	6.8471
Mg/Mg+Fe=		18.64

Ca: Mg: Fe = 36.01 11.93 52.06
Ca: Na: K = 42.06 42.26 15.67
AFM Ratio = 35.53

Sample=? CY74 ALTERED RIM OF MELANITE

ELEM	OX	STRUCT
Na2O	2.05	.208
Al2O3	4.43	.274
SiO2	5.09	.267
CaO	83	4.667
TiO2	.79	.031
Cr2O3	.89	.037
MnO	1.49	.066
FeO	2.26	.099
TOTAL	52.28	5.6503
Mg/Mg+Fe=		0

Ca: Mg: Fe = 97.92 0 [illegible]
Ca: Na: K = 95.73 4.27 0
AFM Ratio = 58.05

Sample=? CY74 MAIN ANOTHER PART

ELEM	OX	STRUCT
K2O	.26	.019
CaO	94.66	5.7
TiO2	.99	.039
Cr2O3	.8	.034
MnO	1.68	.08
FeO	1.68	.079
TOTAL	99	5.9525
Mg/Mg+Fe=		0

Ca: Mg: Fe = 98.63 0 [illegible]
Ca: Na: K = 99.67 0 [illegible]
AFM Ratio = 0

Sample=? CY74 EDGE OF LARGE PHENOCRYST

ELEM	OX	STRUCT
Na2O	1.92	.342
Al2O3	18.5	2
SiO2	65.14	5.974
K2O	13.54	1.584
CaO	.9	.080
Total	100.13	9.9889

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.37 16.98 78.65

AFM Ratio = 100

Sample=? CY75 K-FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.84	1.506
Al2O3	23	2.38
SiO2	64.73	5.684
K2O	.34	.038
CaO	3.09	.291
TOTAL	97.13	9.89899

CA: MG: FE = 100 0 0

CA: NA: K = 15.86 82.07 2.07

Sample=? CY75 ANOTHER PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.11	1.891
Al2O3	20.44	2.116
SiO2	66.91	5.875
K2O	.36	.04
CaO	1.16	.109
TOTAL	101.76	10.031

CA: MG: FE = 100 0 0

CA: NA: K = 5.34 92.7 1.96

Sample=? CY75 GM. FELDSPAR OXNO.=? -25

ELEM	OX	STRUCT
Na2O	4.29	.758
Al2O3	22.86	2.457
SiO2	60.35	5.503
K2O	7.38	.859
CaO	5.12	.5
TOTAL	101.78	10.077

CA: MG: FE = 100 0 0

CA: NA: K = 23.62 35.81 40.58

Sample=? CY75 EPIDOTE CLOT OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	24.94	4.653
SiO2	39.13	6.192
CaO	22.92	3.886
Cr2O3	.47	.059
MnO	.35	.047
FeO	12.2	1.614
TOTAL	96.71	16.451
MG/MG+FE=		0

CA: MG: FE = 70.65 0 29.35

CA: NA: K = 100 0 0

Sample=? CY75 GM. FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.62	.465
Al2O3	18.74	2.025
SiO2	64.77	5.936
K2O	12.67	1.482
CaO	1.18	.115
TOTAL	102.5	10.023

CA: MG: FE = 100 0 0

CA: NA: K = 5.58 22.55 71.87

Sample=? CY75PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.44	1.948
Al2O3	19.92	2.061
SiO2	67.43	5.92
K2O	.52	.058
CaO	.71	.067
TOTAL	102.43	10.054

CA: MG: FE = 100 0 0

CA: NA: K = 3.23 93.97 2.8

Sample=? CY75ANOTHER PART OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	11.57	1.963
Al2O3	19.82	2.045
SiO2	67.96	5.95
K2O	.29	.032
CaO	.36	.034
TOTAL	103.8	10.024

CA: MG: FE = 100 0 0

CA: NA: K = 1.68 96.75 1.58

Sample=? CY75 EPIDOTE IN FELDSPAR OXNO.=? -25

ELEM	OX	STRUCT
Al2O3	24.38	4.533
SiO2	40.13	6.331
CaO	19.97	3.375
TiO2	.58	.069
Cr2O3	.95	.118
MnO	.75	.1
FeO	13.24	1.747
TOTAL	92.31	16.273
MG/MG+FE=		0

CA: MG: FE = 65.89 0 34.11

CA: NA: K = 100 0 0

Sample=? CY75 GM. FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.64	1.812
Al2O3	20.71	2.145
SiO2	66.89	5.879
K2O	1.2	.135
CaO	.57	.054
TOTAL	101.91	10.025

CA: MG: FE = 100 0 0

CA: NA: K = 2.7 90.55 6.75

Sample=? CY75 ANOTHER PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.06	1.715
Al2O3	20.16	2.09
SiO2	67.23	5.913
K2O	1.57	.176
CaO	.97	.091
TOTAL	102.67	9.985

CA: MG: FE = 100 0 0

CA: NA: K = 4.59 86.53 8.88

Sample=? CY76EPIDOTE -WITH FELDSPAR OXNO.=? -25

ELEM	OX	STRUCT
Al2O3	24.83	4.635
SiO2	39.04	6.184
CaO	23.95	4.065
FeO	11.55	1.53
MnO	.62	.083
TOTAL	94.45	16.497

CA: MG: FE = 72.65 0 27.35

CA: NA: K = 100 0 0

Sample=? CY76 REACTION ZONE OXNO.=? -11

ELEM	OX	STRUCT
Na2O	.78	.096
Al2O3	18.27	1.365
SiO2	64.58	4.093
K2O	14.58	1.179
CaO	.92	.063
TiO2	.48	.023
FeO	.39	.02
TOTAL	100.75	6.839

CA: NA: K = 4.71 7.17 88.12

Sample=? CY76RINN EPIDOTE OXNO.=? -25

ELEM	OX	STRUCT
Al2O3	23.26	4.382
SiO2	39.13	6.253
CaO	23.72	4.061
FeO	13.38	1.788
MnO	.5	.068
TOTAL	98.42	16.552
MG/MG+FE=		0

CA: MG: FE = 69.43 0 30.57

CA: NA: K = 100 0 0

SAMPLE=? CY76 EPIDOTE OXNO.=? -12

ELEM	OX	STRUCT
AL203	23.3	2.109
SIO2	38.93	2.991
CAO	23.58	1.94
MNO	.32	.02
FEO	13.88	.891
TOTAL	95.4	7.955

CA: MG: FE = 68.51 0 31.49

SAMPLE=? CY76 ANOTHER EPIDOTE OXNO.=? -12

ELEM	OX	STRUCT
NA2O	.55	.077
MGO	.65	.069
AL2O3	16.97	1.443
SIO2	57.67	4.162
K2O	10.31	.949
CAO	5.33	.412
MNO	.62	.037
FEO	7.89	.475
TOTAL	96.1	7.628

CA: MG: FE = 43.04 7.27 49.69

SAMPLE=? CY76 REPEAT ABOVE FELDSPAR OXNO.=? -12

ELEM	OX	STRUCT
NA2O	.69	.121
AL2O3	19.39	2.067
SIO2	64.56	5.898
K2O	13.3	1.55
CAO	1.27	.124
TIO2	.8	.054
TOTAL	97.2	9.838

CA: NA: K = 6.94 6.78 86.28

SAMPLE=? CY76 EPIDOTE AGAINST ABOVE FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
AL2O3	24.19	2.174
SIO2	39.25	2.993
CAO	23.32	1.906
MNO	.5	.032
FEO	12.72	.811
TOTAL	98.1	7.918

CA: MG: FE = 70.14 0 29.86

SAMPLE=? CY76 EPIDOTE OXNO.=? -12

ELEM	OX	STRUCT
AL2O3	24.73	2.219
SIO2	38.93	2.963
K2O	1.23	.119
CAO	25.06	2.044
FEO	10.05	.639
TOTAL	93.7	7.986

CA: MG: FE = 76.16 0 23.84

SAMPLE=? CY76 ABOVE REPEAT OXNO.=? -12

ELEM	OX	STRUCT
AL2O3	25.66	2.283
SIO2	39.38	2.972
CAO	23.77	1.922
MNO	.28	.018
FEO	10.9	.687
TOTAL	96.6	7.885

CA: MG: FE = 73.65 0 26.35

SAMPLE=? CY76 EPIDOTE OXNO.=? -12

ELEM	OX	STRUCT
AL2O3	24.21	2.179
SIO2	38.95	2.975
CAO	23.59	1.93
MNO	.45	.029
FEO	12.79	.816
TOTAL	96.8	7.933

CA: MG: FE = 70.27 0 29.73

Sample=? CY76 PLAGIOCLASE INC. IN K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.46	1.11
Al2O3	25.01	2.612
SiO2	61.44	5.445
K2O	.69	.078
CaO	6.3	.598
Total	101.52	9.843

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 33.48 62.15 4.37

Sample=? CY76-K-FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.95	.347
Al2O3	18.91	2.045
SiO2	64.22	5.892
K2O	13.08	1.531
CaO	1.1	.108
TiO2	.73	.05
Total	98.26	9.9741

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.44 17.47 77.09

Sample=? CY76 EPIDOTE CENTRE OXNO.=? -25

ELEM	OX	STRUCT
Na2O	1.07	.342
MgO	3.37	.832
Al2O3	12.21	2.382
SiO2	43.07	7.13
K2O	1.2	.253
CaO	16.05	2.847
MnO	.79	.111
FeO	22.25	3.08
Total	97.34	16.9765
Mg/Mg+Fe=		21.27

Ca: Mg: Fe = 42.12 12.31 45.57

Ca: Na: K = 82.71 9.94 7.35

Sample=? CY77 SANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.11	.551
Al2O3	19.37	2.083
SiO2	64.52	5.888
K2O	11.62	1.353
CaO	1.02	.1
TiO2	.37	.025
TOTAL	98.27	9.99999

CA: MG: FE = 100 0 0

CA: NA: K = 4.99 27.5 67.51

Sample=? CY77 BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	12.09	1.299
Al2O3	14.36	1.22
SiO2	41.27	2.975
K2O	9.91	.912
CaO	.39	.03
TiO2	2.3	.125
MnO	.65	.039
FeO	19.04	1.148
TOTAL	97.66	7.748
MG/MG+FE=		53.09

CA: MG: FE = 1.21 52.44 46.35

CA: NA: K = 3.18 0 96.82

Sample=? CY77 MAGNETITE INC. IN ABOVE OXNO.=? -8

ELEM	OX	STRUCT
Na2O	2.98	.474
MgO	.83	.101
Al2O3	5.12	.496
SiO2	3.98	.327
TiO2	5.19	.32
MnO	.37	.026
FeO	81.55	5.6
TOTAL	97.81	7.344
MG/MG+FE=		1.77

CA: MG: FE = 0 1.77 98.23

CA: NA: K = 0 100 0

Sample=? CY77 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.44	.082
Al2O3	35.01	3.919
SiO2	46.36	4.402
K2O	11.67	1.414
CaO	.52	.053
TiO2	.63	.045
FeO	5.35	.425
TOTAL	102.15	10.34
MG/MG+FE=		0

CA: MG: FE = 11.09 0 88.91

CA: NA: K = 3.42 5.29 91.28

CY77, 78, 80, 81

Sample=? CY77 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.1	.549
Al2O3	19.33	2.082
SiO2	64.39	5.883
K2O	11.82	1.377
CaO	.99	.097
TiO2	.37	.025
TOTAL	103.95	10.013

CA: MG: FE = 100 0 0

CA: NA: K = 4.79 27.14 68.07

Sample=? CY77 LARGE SANIDINE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.1	.549
Al2O3	19.2	2.066
SiO2	64.82	5.917
K2O	11.84	1.379
CaO	1.04	.101
TOTAL	102.05	10.012

CA: MG: FE = 100 0 0

CA: NA: K = 4.98 27.06 67.96

Sample=? CY77 FUZZY EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.97	.174
Al2O3	19.76	2.149
SiO2	63.34	5.844
K2O	14.7	1.73
CaO	.83	.082
TiO2	.4	.028
TOTAL	100.45	10.007

CA: MG: FE = 100 0 0

CA: NA: K = 4.13 8.76 87.11

Sample=? CY77 GM. FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.11	.552
Al2O3	18.9	2.036
SiO2	65.03	5.943
K2O	12.24	1.427
CaO	.73	.071
TOTAL	101.97	10.029

CA: MG: FE = 100 0 0

CA: NA: K = 3.46 26.93 69.61

SAMPLE=? CY78 FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
NA2O	2.05	.361
AL2O3	18.23	1.957
SIO2	65.65	5.98
K2O	12.21	1.419
CAO	1.06	.103
TIO2	.8	.054
TOTAL	99.7	9.878

SAMPLE=? CY78FELDSPAR GM DK OXNO.=? -16

ELEM	OX	STRUCT
NA2O	.53	.093
AL2O3	17.46	1.888
SIO2	66.21	6.075
K2O	14.68	1.719
CAO	1.13	.111
TOTAL	98.8	9.888

SAMPLE=? CY78 GM.FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
NA2O	4.46	.778
AL2O3	17.89	1.897
SIO2	67.58	6.079
K2O	9.35	1.072
CAO	.71	.068
TOTAL	98	9.897

SAMPLE=? CY78 LARGE PHENOCRYST CENTRE OXNO.=? -16

ELEM	OX	STRUCT
NA2O	.86	.153
AL2O3	18.1	1.954
SIO2	65.25	5.976
K2O	13.74	1.606
CAO	1.12	.109
TIO2	.93	.064
TOTAL	99.6	9.864

SAMPLE=? CY78 ABOVE NEAR EDGE OXNO.=? -6

ELEM	OX	STRUCT
NA2O	.59	.039
AL2O3	18.05	.731
SIO2	64.77	2.229
K2O	14.02	.615
CAO	1.12	.041
TIO2	1.43	.037
TOTAL	97.4	3.695

SAMPLE=? CY80 FELDSPAR PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
NA2O	3.53	.62
AL2O3	19.22	2.051
SIO2	65.74	5.954
K2O	10.6	1.225
CAO	.9	.086
TOTAL	97.4	9.939

CA: NA: K = 4.5 32.1 63.4

SAMPLE=? CY80 PDK.G.MASS \? OXNO.=? -16

ELEM	OX	STRUCT
NA2O	11.97	2.04
AL2O3	19.73	2.043
SIO2	67.45	5.928
K2O	.43	.043
FEO	.41	.03
TOTAL	101.8	10.092

CA: NA: K = 0 97.67 2.33

SAMPLE=? CY80 LGHT. GM XTAL OXNO.=? -16

ELEM	OX	STRUCT
AL2O3	18.76	2.022
SIO2	65.65	6.005
K2O	14.43	1.684
CAO	1.16	.113
TOTAL	97.3	9.826

CA: NA: K = 6.33 0 93.67

SAMPLE=? CY80 DK. GMASS. OXNO.=? -16

ELEM	OX	STRUCT
NA2O	11.75	1.994
AL2O3	19.75	2.037
SIO2	68.13	5.963
K2O	.37	.041
TOTAL	98.6	10.037

CA: NA: K = 0 97.95 2.05

Sample=? CY80 LARGE PHENOCRYST CENTRE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.9	.161
Al2O3	19.42	2.1
SiO2	63.21	5.798
K2O	13.46	1.575
CaO	.7	.069
TiO2	2.3	.159
TOTAL	96.6	9.86199

CA: MG: FE = 100 0 0

CA: NA: K = 3.82 8.92 87.26

Sample=? CY80 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.23	.219
Al2O3	19.52	2.116
SiO2	62.64	5.762
K2O	13.52	1.586
CaO	.78	.077
TiO2	2.32	.16
TOTAL	99.75	9.92

CA: MG: FE = 100 0 0

CA: NA: K = 4.09 11.64 84.27

Sample=? CY81 SERICITE?? OXNO.=? -11

ELEM	OX	STRUCT
Na2O	1.25	.154
Al2O3	18.4	1.374
SiO2	64.9	4.109
K2O	14.68	1.186
CaO	.76	.051
TOTAL	104.78	6.874

CA: MG: FE = 100 0 0

CA: NA: K = 3.47 11.07 85.26

CY83, 85A

Sample=? CY83 OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.86	.552
MgO	7.19	1.642
Al2O3	12.35	2.231
SiO2	40.24	6.167
K2O	1.71	.335
CaO	11.25	1.848
TiO2	1.26	.146
MnO	.89	.116
FeO	23.24	2.978
Total	98.06	16.0149
Mg/Mg+Fe=		35.54

Ca: Mg: Fe = 28.57 25.39 46.04
Ca: Na: K = 67.57 20.18 12.25

Sample=? REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.75	.312
Al2O3	18.68	2.021
SiO2	64.29	5.9
K2O	13.34	1.562
CaO	.87	.085
TiO2	1.06	.073
Total	100.38	9.9535

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.34 15.93 79.73

Sample=? REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.64	1.142
Al2O3	24.6	2.573
SiO2	61.48	5.454
K2O	.78	.089
CaO	6.49	.617
Total	100.6	9.8744

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 33.39 61.8 4.82

Sample=? SAME

ELEM	OX	STRUCT
Na2O	1.79	.319
Al2O3	18.56	2.008
SiO2	64.5	5.921
K2O	13.47	1.578
CaO	.85	.084
TiO2	.83	.057
Total	100.25	9.9665

Ca: Na: K = 4.24 16.1 79.66

Sample=? CY85A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	17.5	1.926
SiO2	64.03	5.979
K2O	16.94	2.018
CaO	1.05	.105
FeO	.48	.037
TOTAL	100.41	10.065
MG/MG+FE=		75

CA: MG: FE = 41.5 43.87 14.62
CA: NA: K = 3.08 37.69 59.23

Sample=? CY85A SMALL CRYSTAL IN FELDSPATHOID? INC. OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	17.38	1.917
SiO2	63.92	5.979
K2O	17.26	2.06
CaO	1.02	.102
FeO	.39	.03
TOTAL	98.76	10.088
MG/MG+FE=		78.72

CA: MG: FE = 41.98 45.68 12.35
CA: NA: K = 3.67 22.31 74.02

Sample=? CY85A SAMIDINE PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.44	.08
Al2O3	18.8	2.072
SiO2	65.33	5.973
K2O	15.46	1.826
CaO	.95	.094
TiO2	.93	.065
TOTAL	101.04	9.98999
MG/MG+FE=		75

CA: MG: FE = 38.84 45.87 15.29
CA: NA: K = 4.7 4 91.3

Sample=? CY85A AEGIRINE LATH OXNO.=? -6

ELEM	OX	STRUCT
Na2O	12.1	.911
MgO	1.28	.074
Al2O3	6.78	.31
SiO2	52	2.019
K2O	1.37	.068
CaO	2.27	.094
TiO2	2.1	.061
MnO	.53	.017
FeO	21.55	.7
TOTAL	103.01	4.254
MG/MG+FE=		9.56

CA: MG: FE = 10.83 8.53 80.65
CA: NA: K = 8.76 84.9 6.34

Sample=? CY85A ZEOLITE OXNO.=? -10

ELEM	OX	STRUCT
Na2O	13.49	1.463
Al2O3	31.08	2.048
SiO2	55.41	3.097
TOTAL	89.5	6.608

Sample=? CY85A SANIDINE PHENOCRYST

ELEM	OX	STRUCT
Na2O	.44	.08
Al2O3	19.25	2.104
SiO2	61.61	5.712
K2O	14.49	1.714
CaO	1.01	.1
TiO2	2.82	.197
FeO	.36	.028
TOTAL	100.14	9.935
MG/MG+FE=		0

CA: MG: FE = 78.12 0 21.87
CA: NA: K = 5.28 4.22 90.5

Sample=? CY85A ANOTHER SANIDINE

ELEM	OX	STRUCT
Na2O	.49	.087
Al2O3	19.52	2.132
SiO2	61.31	5.681
K2O	14.32	1.693
CaO	.91	.09
TiO2	3.09	.215
FeO	.36	.028
TOTAL	100.67	9.92599
MG/MG+FE=		0

OXNO.=? -16

CA: MG: FE = 76.27 0 23.73
CA: NA: K = 4.81 4.65 90.53

Sample=? CY85A ANOTHER SANIDINE

ELEM	OX	STRUCT
Al2O3	17.4	1.917
SiO2	64.05	5.984
K2O	17.12	2.04
CaO	1.11	.111
FeO	.33	.026
TOTAL	103.5	10.078
MG/MG+FE=		0

OXNO.=? -16

CA: MG: FE = 81.02 0 18.98
CA: NA: K = 5.16 0 94.84

Sample=? CY85AFELDSPATHOID OXNO.=? -6

ELEM	OX	STRUCT
Na2O	10.64	.779
SiO2	57.84	2.185
CaO	27.33	1.106
MnO	3.41	.109
FeO	.81	.026
TOTAL	93.3	4.205
MG/MG+FE=		0

CA: MG: FE = 97.7 0 2.3
CA: NA: K = 58.67 41.33 0

Sample=? CY85A PSEUDO-HEX. CRYSTAL

ELEM	OX	STRUCT
Na2O	9.6	.706
MgO	.4	.023
SiO2	56.71	2.152
CaO	29.33	1.193
MnO	3.67	.118
FeO	.28	.009
TOTAL	95.82	4.201
MG/MG+FE=		71.87

CA: MG: FE = 97.39 1.88 .73
CA: NA: K = 62.82 37.18 0

CY85A

Sample=? CY85A PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.65	.047
MgO	12.9	.723
Al2O3	1.98	.088
SiO2	51.58	1.938
CaO	22.77	.917
TiO2	.4	.011
MnO	.43	.014
FeO	9.3	.292
TOTAL	103.41	4.03

MG/MG+FE= 71.23

CA: MG: FE = 47.46 37.42 15.11

CA: NA: K = 95.12 4.88 0

Sample=? CY85A SANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.4	.073
Al2O3	19.05	2.081
SiO2	62.76	5.819
K2O	15	1.774
CaO	1.04	.103
TiO2	1.3	.091
FeO	.48	.037
TOTAL	102.73	9.97799

MG/MG+FE= 0

CA: MG: FE = 73.57 0 26.43

CA: NA: K = 5.28 3.74 90.97

Sample=? CY85A LATH CRSTAL OXNO.=? -6

ELEM	OX	STRUCT
Na2O	11.71	.903
MgO	1.33	.079
Al2O3	.89	.042
SiO2	52.43	2.084
CaO	3.79	.161
TiO2	3.29	.098
MnO	.76	.026
FeO	25.81	.858
TOTAL	99.06	4.251

MG/MG+FE= 8.43

CA: MG: FE = 14.66 7.19 78.14

CA: NA: K = 15.13 84.87 0

Sample=? CY85A AEGIRINE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	12.25	.931
MgO	2.82	.165
Al2O3	1.19	.055
SiO2	53.8	2.108
CaO	3.11	.13
TiO2	2.3	.068
MnO	.49	.016
FeO	24.02	.787
TOTAL	99.4	4.26

MG/MG+FE= 17.33

CA: MG: FE = 12.01 15.25 72.74

CA: NA: K = 12.25 87.75 0

Sample=? CY85A SANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.44	.08
Al2O3	19.14	2.094
SiO2	62.49	5.8
K2O	14.99	1.775
CaO	1.15	.114
TiO2	1.25	.087
FeO	.55	.043
TOTAL	102.47	9.993

MG/MG+FE= 0

CA: MG: FE = 72.61 0 27.39

CA: NA: K = 5.79 4.06 90.15

Sample=? CY85A SANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.69	.123
Al2O3	19.48	2.125
SiO2	61.57	5.696
K2O	14.03	1.657
CaO	.92	.092
TiO2	2.95	.205
FeO	.35	.027
TOTAL	100.36	9.925

MG/MG+FE= 0

CA: MG: FE = 77.31 0 22.69

CA: NA: K = 4.91 6.57 88.51

Sample=? CY85A PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.67	.05
MgO	11.36	.647
Al2O3	1.89	.085
SiO2	49.97	1.911
CaO	22.61	.926
TiO2	.78	.023
MnO	.44	.014
FeO	12.26	.392
TOTAL	102.59	4.048

MG/MG+FE= 62.27

CA: MG: FE = 47.12 32.93 19.95

CA: NA: K = 94.88 5.12 0

Sample=? CY85ASANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	18.9	2.062
SiO2	63.56	5.884
K2O	15.35	1.813
CaO	1.04	.103
TiO2	.62	.043
FeO	.53	.041
TOTAL	101.13	9.946

MG/MG+FE= 0

CA: MG: FE = 71.53 0 28.47

CA: NA: K = 5.38 0 94.62

Sample=? CY85A FELDSPATHOID OXNO.=? -6

ELEM	OX	STRUCT
Na2O	10.14	.789
MgO	1.66	.099
Al2O3	.76	.036
SiO2	51.23	2.057
CaO	6.09	.262
TiO2	2.42	.073
MnO	.93	.032
FeO	26.78	.899
TOTAL	98.72	4.247

MG/MG+FE= 9.92

CA: MG: FE = 20.79 7.86 71.35

CA: NA: K = 24.93 75.07 0

Sample=? CY85A AEDIRINE LATH OXNO.=? -6

ELEM	OX	STRUCT
Na2O	11.4	.874
MgO	1.26	.074
Al2O3	2.29	.107
SiO2	52.47	2.075
K2O	.81	.041
CaO	3.26	.138
TiO2	2.9	.086
MnO	.7	.023
FeO	24.89	.823
TOTAL	98.68	4.241

MG/MG+FE= 8.25

CA: MG: FE = 13.33 7.15 79.52

CA: NA: K = 13.11 83 3.89

Sample=? CY85A PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.37	.181
MgO	6.88	.403
Al2O3	3.1	.143
SiO2	48.56	1.906
CaO	19.88	.836
TiO2	.5	.015
MnO	.79	.026
FeO	17.91	.588
TOTAL	98.18	4.098

MG/MG+FE= 40.67

CA: MG: FE = 45.76 22.06 32.18

CA: NA: K = 82.2 17.8 0

Sample=? CY85AANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.71	.131
MgO	6.72	.395
Al2O3	4.46	.207
SiO2	46.74	1.843
CaO	20.88	.882
TiO2	.75	.022
MnO	.9	.03
FeO	17.86	.589
TOTAL	98.5	4.099

MG/MG+FE= 40.14

CA: MG: FE = 47.27 21.17 31.56

CA: NA: K = 87.07 12.93 0

CY85A,B

Sample=? CY85A ANOTHER CORE OF ANOTHER CRYSTAL

ELEM	OX	STRUCT
Na2O	.41	.074
Al2O3	18.49	2.012
SiO2	64.07	5.915
K2O	15.15	1.784
CaO	.7	.069
TiO2	.97	.067
Total	99.77	9.9413

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.57 3.8 91.63

AFM Ratio = 100

Sample=? CY85A EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	.21	.038
Al2O3	18.92	2.055
SiO2	63.64	5.863
K2O	14.75	1.734
CaO	.88	.087
TiO2	1.59	.11
Total	99.21	9.886

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.68 2.04 93.28

AFM Ratio = 100

Sample=? CY85A ANOTHER CORE

ELEM	OX	STRUCT
Na2O	.27	.049
Al2O3	18.85	2.05
SiO2	63.49	5.86
K2O	15.01	1.767
CaO	.86	.085
TiO2	1.52	.106
Total	101.54	9.9172

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.47 2.58 92.95

AFM Ratio = 100

Sample=? CY85A EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	.39	.07
Al2O3	18.8	2.043
SiO2	63.81	5.884
K2O	14.91	1.754
CaO	.9	.089
TiO2	1.19	.083
Total	101.59	9.9238

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.65 3.66 91.69

AFM Ratio = 100

Sample=? CY85A REPEAT ABOVE CORE

ELEM	OX	STRUCT
Na2O	.65	.116
Al2O3	19.63	2.129
SiO2	61.93	5.696
K2O	13.44	1.577
CaO	.81	.08
TiO2	3.53	.244
Total	100.35	9.8417

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.51 6.54 88.95

AFM Ratio = 100

Sample=? CY85A ANOTHER CORE

ELEM	OX	STRUCT
Na2O	.86	.154
Al2O3	19.07	2.066
SiO2	63.63	5.849
K2O	13.99	1.64
CaO	.82	.081
TiO2	1.63	.113
Total	101.45	9.9028

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.32 8.21 87.47

AFM Ratio = 100

Sample=? CY85A EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	.62	.11
Al2O3	19.11	2.071
SiO2	63.29	5.819
K2O	13.99	1.641
CaO	.8	.079
TiO2	2.18	.151
Total	100	9.8706

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.32 6.01 89.67

AFM Ratio = 100

Sample=? CY85B ANOTHER CORE

ELEM	OX	STRUCT
Na2O	.54	.095
Al2O3	19.09	2.072
SiO2	62.9	5.772
K2O	14.08	1.654
CaO	.87	.086
TiO2	2.52	.174
Total	98.53	9.8734

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.68 5.23 90.09

AFM Ratio = 100

Sample=? CY85B LARGE PHENOCRYST CORE

ELEM	OX	STRUCT
Na2O	.84	.149
Al2O3	19.1	2.074
SiO2	62.86	5.791
K2O	13.99	1.644
CaO	.9	.089
TiO2	2.31	.16
Total	97.66	9.9082

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.73 7.92 87.35

AFM Ratio = 100

Sample=? CY85B EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	.76	.135
Al2O3	18.99	2.058
SiO2	63.61	5.847
K2O	14.06	1.649
CaO	.76	.075
TiO2	1.83	.136
Total	101.16	9.8901

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.03 7.26 88.7

AFM Ratio = 100

Sample=? CY85B ANOTHER CORE

ELEM	OX	STRUCT
Na2O	.74	.133
Al2O3	19.07	2.067
SiO2	63.07	5.8
K2O	13.86	1.626
CaO	.78	.077
TiO2	2.48	.171
Total	100.5	9.8744

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.19 7.24 88.56

AFM Ratio = 100

Sample=? CY85B EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	.33	.059
Al2O3	19.47	2.113
SiO2	62.33	5.739
K2O	14.02	1.647
CaO	.82	.08
TiO2	3.03	.21
Total	98	9.8477

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.48 3.3 92.22

AFM Ratio = 100

Sample=? CY85B PYROXENE

ELEM	OX	STRUCT
Na2O	1.3	.097
MgO	10.2	.585
Al2O3	2.2	.1
SiO2	50.04	1.925
CaO	21.16	.872
TiO2	.38	.011
MnO	.65	.021
FeO	14.07	.453
Total	98.76	4.0631

Mg/Mg+Fe= 56.36

Ca: Mg: Fe = 45.65 30.63 23.72

Ca: Na: K = 89.99 10.01 0

AFM Ratio = 4.6

CY85A,85B

Sample=? CY85A PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.67	.05
MgO	10.48	.601
Al2O3	2.97	.135
SiO2	48.52	1.866
CaO	22.83	.941
TiO2	1.13	.033
Cr2O3	.13	.004
MnO	.31	.01
FeO	12.97	.417
TOTAL	99.73	4.057

MG/MG+FE= 59.04
CA: MG: FE = 48.03 30.68 21.29
CA: NA: K = 94.95 5.05 0

Sample=? CY85AFELDSPATHOID? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	14.4	2.504
MgO	.2	.027
Al2O3	26	2.749
SiO2	58.79	5.274
K2O	.27	.03
TiO2	.15	.01
FeO	.22	.016
TOTAL	92.06	10.61

MG/MG+FE= 62.79
CA: MG: FE = 0 62.79 37.21
CA: NA: K = 0 98.82 1.18

Sample=? CY85A SANIDINE? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.43	.433
Al2O3	18.91	2.053
SiO2	63.83	5.879
K2O	13.06	1.534
CaO	1.09	.108
TiO2	.3	.021
FeO	.36	.028
TOTAL	100.96	10.056

MG/MG+FE= 0
CA: MG: FE = 79.41 0 20.59
CA: NA: K = 5.2 20.87 73.93

Sample=? CY85A ANOTHER SANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.01	.541
Al2O3	18.65	2.042
SiO2	62.94	5.846
K2O	13.6	1.612
CaO	1.32	.131
FeO	.5	.039
TOTAL	101.3	10.211

MG/MG+FE= 0
CA: MG: FE = 77.06 0 22.94
CA: NA: K = 5.74 23.69 70.58

Sample=? CY85ASANIDINE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.43	.435
Al2O3	18.46	2.014
SiO2	63.58	5.885
K2O	13.14	1.552
CaO	1.3	.129
FeO	1.08	.084
TOTAL	99.94	10.099

MG/MG+FE= 0
CA: MG: FE = 60.56 0 39.44
CA: NA: K = 6.1 20.56 73.35

Sample=? CY85A FELDSPATHOID HAS SULPHUR

ELEM	OX	STRUCT
Na2O	17.59	3.453
Al2O3	30.61	3.653
SiO2	36.94	3.74
K2O	6.81	.879
CaO	8.03	.871
TOTAL	83.88	12.596

CA: MG: FE = 100 0 0
CA: NA: K = 16.74 66.37 16.89

Sample=? CY85A ANALCITE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	14.53	2.527
Al2O3	26.02	2.751
SiO2	58.96	5.289
K2O	.27	.03
FeO	.23	.017
TOTAL	90.11	10.614

MG/MG+FE= 0
CA: MG: FE = 0 0 100
CA: NA: K = 0 98.83 1.17

Sample=? CY85A ANALCITE AGAIN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	14.84	2.587
MgO	.25	.033
Al2O3	26.09	2.765
SiO2	58.36	5.247
K2O	.27	.03
FeO	.18	.014
TOTAL	90.29	10.676

MG/MG+FE= 70.21
CA: MG: FE = 0 70.21 29.79
CA: NA: K = 0 98.85 1.15

Sample=? CY85B MAGNETITE INC. IN ABOVE OXNO.=? -8

ELEM	OX	STRUCT
Na2O	1.11	.193
MgO	.85	.114
Al2O3	1.54	.164
SiO2	.34	.03
CaO	.76	.073
TiO2	3.67	.249
MnO	.53	.041
FeO	91.14	6.871
Total	96.72	7.7354

Mg/Mg+Fe= 1.63
Ca: Mg: Fe = 1.03 1.62 97.35
Ca: Na: K = 27.44 72.56 0
AFM Ratio = 1.16

Sample=? CY85B ANOTHER

ELEM	OX	STRUCT
Na2O	13.68	1.286
Al2O3	31.26	1.788
SiO2	44.36	2.152
K2O	7.26	.449
CaO	.68	.035
FeO	2.77	.112
Total	101.1	5.8224

Mg/Mg+Fe= 0
Ca: Mg: Fe = 23.81 0 76.19
Ca: Na: K = 1.98 72.66 25.37
AFM Ratio = 88.87

Sample=? CY85B ANOTHER OXNO.=? -8

ELEM	OX	STRUCT
Na2O	13.95	1.302
Al2O3	31.85	1.807
SiO2	44.98	2.165
K2O	6.85	.42
CaO	.32	.017
FeO	2.04	.082
Total	100.98	5.793

Mg/Mg+Fe= 0
Ca: Mg: Fe = 17.17 0 82.83
Ca: Na: K = .98 74.87 24.15
AFM Ratio = 91.68

Sample=? CY85B ANOTHER

ELEM	OX	STRUCT
Na2O	13.37	1.257
Al2O3	31.86	1.822
SiO2	44.02	2.135
K2O	7.33	.454
CaO	.65	.034
FeO	2.66	.108
Total	100.34	5.8094

Mg/Mg+Fe= 0
Ca: Mg: Fe = 23.94 0 76.06
Ca: Na: K = 1.95 72.03 26.02
AFM Ratio = 89.4

Sample=? REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	.41	.074
Al2O3	18.69	2.051
SiO2	61.75	5.752
K2O	14.34	1.727
CaO	1.2	.12
TiO2	2.14	.15
FeO	1.28	.099
Total	100	9.9738

Mg/Mg+Fe= 0

Ca: Mg: Fe = 54.79 0 45.21

Ca: Na: K = 6.25 3.85 89.9

AFM Ratio = 91.2

Sample=? REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	.34	.06
Al2O3	19.63	2.139
SiO2	62.15	5.745
K2O	14.17	1.671
CaO	1.01	.1
TiO2	2.04	.142
FeO	.67	.052
Total	99.99	9.909

Mg/Mg+Fe= 0

Ca: Mg: Fe = 65.79 0 34.21

Ca: Na: K = 5.46 3.28 91.26

AFM Ratio = 95.36

Sample=? CY85B GM. FELDSPAR

ELEM	OX	STRUCT
Al2O3	17.38	1.914
SiO2	63.98	5.976
K2O	16.49	1.965
CaO	1.26	.126
FeO	.89	.069
Total	100.64	10.0503

Mg/Mg+Fe= 0

Ca: Mg: Fe = 64.62 0 35.38

Ca: Na: K = 6.03 0 93.97

AFM Ratio = 93.27

Sample=? CY85B ANOTHER FELDSPAR

ELEM	OX	STRUCT
Na2O	.35	.063
Al2O3	19.46	2.124
SiO2	62.06	5.749
K2O	14.47	1.71
CaO	1.03	.103
TiO2	1.99	.139
FeO	.63	.049
Total	99.65	9.9365

Mg/Mg+Fe= 0

Ca: Mg: Fe = 67.76 0 32.24

Ca: Na: K = 5.49 3.36 91.15

AFM Ratio = 95.59

Sample=? CY85B ANOTHER GM. FELDSPAR

ELEM	OX	STRUCT
Na2O	.37	.067
Al2O3	18.64	2.043
SiO2	62.8	5.839
K2O	14.84	1.76
CaO	1.16	.116
TiO2	.94	.066
FeO	1.25	.097
Total	100.1	9.9876

Mg/Mg+Fe= 0

Ca: Mg: Fe = 54.46 0 45.54

Ca: Na: K = 5.97 3.45 90.58

AFM Ratio = 91.33

Sample=? CY85B NEPHELINE AGAIN

ELEM	OX	STRUCT
Na2O	12.95	.606
Al2O3	32.89	.936
SiO2	44.05	1.062
K2O	7.17	.224
CaO	.42	.011
FeO	2.39	.048
Total	99	2.8855

Mg/Mg+Fe= 0

Ca: Mg: Fe = 18.64 0 81.36

Ca: Na: K = 1.31 72.06 26.63

AFM Ratio = 90.69

Sample=? CY85B SMALL K-FELDSPAR

ELEM	OX	STRUCT
Na2O	.97	.18
Al2O3	18.51	1.825
SiO2	63.68	5.97
K2O	15.24	1.822
CaO	1.34	.134
TiO2	.11	.015
FeO	2.25	.174
Total	102.32	10.0632

Mg/Mg+Fe= 0

Ca: Mg: Fe = 45.23 0 54.77

Ca: Na: K = 6.39 6.68 86.93

AFM Ratio = 83.84

Sample=? CY85B SMALL K-FELDSPAR

ELEM	OX	STRUCT
Na2O	3.03	1.495
Al2O3	26.86	3.018
SiO2	51.6	4.92
K2O	11.23	1.366
CaO	1.16	.119
FeO	1.07	.085
Total	97.75	11.0009

Mg/Mg+Fe= 0

Ca: Mg: Fe = 58.33 0 41.67

Ca: Na: K = 4 50.13 45.87

AFM Ratio = 94.67

Sample=? CY85B K-FELDSPAR

ELEM	OX	STRUCT
Al2O3	17.39	1.911
SiO2	64.27	5.989
K2O	16.59	1.974
CaO	1.23	.123
FeO	.56	.044
Total	99.54	10.0432

Mg/Mg+Fe= 0

Ca: Mg: Fe = 71.62 0 28.38

Ca: Na: K = 5.87 0 94.13

AFM Ratio = 95.6

Sample=? CY85B ANOTHER K-FELDSPAR

ELEM	OX	STRUCT
Na2O	1.66	.303
Al2O3	15.45	1.725
SiO2	62.75	5.947
K2O	14.46	1.746
CaO	1.27	.129
TiO2	.21	.015
FeO	4.21	.333
Total	100.67	10.2017

Mg/Mg+Fe= 0

Ca: Mg: Fe = 27.92 0 72.08

Ca: Na: K = 5.91 13.98 80.11

AFM Ratio = 72.16

Sample=? CY85B ANOTHER K-FELDSPAR

ELEM	OX	STRUCT
Al2O3	18.55	2.03
SiO2	64	5.941
K2O	15.46	1.75
CaO	.98	.097
Total	100.51	10.0185

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.74 0 95.26

AFM Ratio = 100

Sample=? CY85B NEPHILINE

ELEM	OX	STRUCT
Na2O	13.32	.618
Al2O3	32.29	.91
SiO2	45.46	1.088
K2O	6.66	.203
CaO	.53	.014
FeO	1.75	.033
Total	100.01	2.8677

Mg/Mg+Fe= 0

Ca: Mg: Fe = 28.57 0 71.43

Ca: Na: K = 1.68 74.01 24.31

AFM Ratio = 92.86

CY85B, CYH

Sample=? CY85B GM. K-FELDSPAR

ELEM	OX	STRUCT
Na2O	11.69	2.181
Al2O3	29.86	3.386
SiO2	47.23	4.543
K2O	9.31	1.106
CaO	.56	.055
FeO	1.67	.134
Total	101.91	11.4048
Mg/Mg+Fe=	0	
Ca: Mg: Fe = 28.34	0	71.66
Ca: Na: K = 1.59	65.3	33.11
AFM Ratio = 92.67		

Sample=? CY85B SANIDINE PHENOCRYST CENTRE

ELEM	OX	STRUCT
Na2O	.6	.106
Al2O3	19.11	2.078
SiO2	63.12	3.821
K2O	14.52	1.708
CaO	.64	.083
TiO2	1.8	.125
Total	99.88	7.9228
Ca: Mg: Fe = 100	0	0
Ca: Na: K = 4.37	5.69	89.94
AFM Ratio = 100		

Sample=? CY85B PYROXENE

ELEM	OX	STRUCT
Na2O	.68	.051
MgO	11.27	.64
Al2O3	2.11	.095
SiO2	50.35	1.919
CaO	22.86	.933
TiO2	.61	.017
MnO	.44	.014
FeO	11.69	.372
Total	99.73	4.0417
Mg/Mg+Fe=		63.24
Ca: Mg: Fe = 47.97	32.9	19.13
Ca: Na: K = 94.82	5.18	0
AFM Ratio = 4.48		

Sample=? CY85B ANOTHER

ELEM	OX	STRUCT
Na2O	1.15	.086
MgO	9.58	.551
Al2O3	2.79	.127
SiO2	49.21	1.9
CaO	21.75	.9
TiO2	.53	.015
MnO	.53	.017
FeO	14.47	.467
Total	101.27	4.0641
Mg/Mg+Fe=		54.13
Ca: Mg: Fe = 46.92	28.73	24.35
Ca: Na: K = 91.28	8.72	0
AFM Ratio = 5.87		

Sample=? CY85B ANOTHER

ELEM	OX	STRUCT
Na2O	1.37	.103
MgO	8.69	.503
Al2O3	1.88	.086
SiO2	49.9	1.937
CaO	21.52	.895
TiO2	.25	.007
MnO	.54	.018
FeO	15.84	.514
Total	100.05	4.0642
Mg/Mg+Fe=		49.46
Ca: Mg: Fe = 46.31	26.31	26.68
Ca: Na: K = 89.68	10.32	0
AFM Ratio = 4.06		

Sample=? CY85B ANOTHER

ELEM	OX	STRUCT
Na2O	.76	.056
MgO	11.64	.859
Al2O3	2.48	.111
SiO2	50.38	1.914
CaO	22.94	.934
TiO2	.43	.012
MnO	.22	.007
FeO	11.14	.354
Total	99.28	4.0466
Mg/Mg+Fe=		65.05
Ca: Mg: Fe = 47.97	33.85	18.18
Ca: Na: K = 94.34	5.66	0
AFM Ratio = 5.19		

Sample=? CY-H PYROXENE

ELEM	OX	STRUCT
MgO	9.09	.624
SiO2	48.81	1.935
CaO	23.44	.971
TiO2	.63	.022
MnO	.4	.01
FeO	17.42	.645
Total	101.8	4.0...
Mg/Mg+Fe=		71...
Ca: Mg: Fe = 48.7	35...	15...
Ca: Na: K = ...	...	0

Sample=? CY85B NEPHELINE

ELEM	OX	STRUCT
Na2O	12.86	1.207
Al2O3	31.26	1.783
SiO2	44.89	2.172
K2O	7.76	.479
CaO	.82	.042
FeO	2.4	.097
Total	100.21	5.78

No such option!

Ca: Mg: Fe = 30.22 0 69.78

Ca: Na: K = 2.43 69.85 27.72

AFM Ratio = 90.19

Sample=? CY85B K-FELDSPAR WITH ABOVE

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.59	1.204
Al2O3	26.74	2.972
SiO2	52.97	4.995
K2O	8.59	1.034
CaO	1.7	.171
FeO	3.32	.262
Total	99.26	10.6382

Mg/Mg+Fe= 0

Ca: Mg: Fe = 39.49 0 60.51

Ca: Na: K = 7.1 49.98 42.92

AFM Ratio = 85.01

Sample=? CY85B K-FELDSPAR

ELEM	OX	STRUCT
Na2O	2.49	.448
Al2O3	22.52	2.463
SiO2	60.05	5.573
K2O	13.4	1.587
CaO	1.08	.107
FeO	.46	.036
Total	101.12	10.2132

Mg/Mg+Fe= 0

Ca: Mg: Fe = 74.83 0 25.17

Ca: Na: K = 5 20.92 74.07

AFM Ratio = 97.16

Sample=? AGAIN

ELEM	OX	STRUCT
Na2O	.28	.05
Al2O3	17.92	1.967
SiO2	64.04	5.962
K2O	16.43	1.951
CaO	.97	.096
FeO	.36	.028
Total	100.01	10.0551

Mg/Mg+Fe= 0

Ca: Mg: Fe = 77.42 0 22.58

Ca: Na: K = 4.58 2.38 93.04

AFM Ratio = 97.23

Sample=? CY85B ANOTHER K-FELDSPAR

ELEM	OX	STRUCT
Na2O	7.94	1.448
Al2O3	29.59	3.279
SiO2	51.15	4.81
K2O	9.2	1.104
CaO	.81	.082
FeO	1.3	.102
Total	100.04	10.8259

Mg/Mg+Fe= 0

Ca: Mg: Fe = 44.57 0 55.43

Ca: Na: K = 3.11 54.97 41.91

AFM Ratio = 94.14

Sample=? CY85B K-FELDSPAR WITH ABOVE

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.26	.047
Al2O3	17.43	1.915
SiO2	64.1	5.977
K2O	15.98	1.901
CaO	1.11	.111
FeO	1.11	.087
Total	100.94	10.0392

Mg/Mg+Fe= 0

Ca: Mg: Fe = 56.06 0 43.94

Ca: Na: K = 5.37 2.28 92.33

AFM Ratio = 91.67

Sample=? CY85B K-FELDSPAR? IN NEPHELINE

OXNO.=? -14

ELEM	OX	STRUCT
Na2O	.35	.062
Al2O3	17.81	1.955
SiO2	54.09	5.968
K2O	16.25	1.931
CaO	1	.099
FeO	.51	.039
Total	101.19	10.0528

Mg/Mg+Fe= 0

Ca: Mg: Fe = 71.74 0 28.26

Ca: Na: K = 4.73 2.96 92.3

AFM Ratio = 96.16

Sample=? CY85B CRYSTAL? IN ABOVE NEPHELINE

OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	17.77	1.951
SiO2	64.27	5.984
K2O	15.99	2.018
CaO	.97	.097
Total	98.44	10.0496

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.59 0 95.41

AFM Ratio = 100

Sample=? CY85B AGAIN ANOTHER PART

ELEM	OX	STRUCT
Na2O	12.91	1.206
Al2O3	32.33	1.836
SiO2	44.71	2.155
K2O	8.08	.497
CaO	.45	.023
FeO	1.33	.062
Total	97.41	5.7788

Mg/Mg+Fe= 0

Ca: Mg: Fe = 27.06 0 72.94

Ca: Na: K = 1.33 69.87 28.79

AFM Ratio = 93.67

Sample=? CY85B CRYSTAL INCLUDED IN ABOVE

ELEM	OX	STRUCT
Na2O	1.81	.329
Al2O3	18.74	2.07
SiO2	62.14	5.822
K2O	15.58	1.863
CaO	.96	.096
FeO	.76	.06
Total	100.98	10.2392

Mg/Mg+Fe= 0

Ca: Mg: Fe = 61.54 0 38.46

Ca: Na: K = 4.2 14.38 81.42

AFM Ratio = 94.52

Sample=? CY85B K-FELDSPAR CRYSTAL

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.45	.081
Al2O3	17.17	1.884
SiO2	64.55	6.007
K2O	15.73	1.867
CaO	1.01	.101
FeO	1.1	.085
Total	101.58	10.0251

Mg/Mg+Fe= 0

Ca: Mg: Fe = 54.3 0 45.7

Ca: Na: K = 4.93 3.95 91.12

AFM Ratio = 91.72

Sample=? CY85B ANOTHER NEPHELINE

OXNO.=? -8

ELEM	OX	STRUCT
Na2O	14.01	1.303
Al2O3	31.82	1.798
SiO2	45.46	2.18
K2O	6.54	.4
CaO	.32	.016
FeO	1.85	.074
Total	97.62	5.7724

Mg/Mg+Fe= 0

Ca: Mg: Fe = 17.78 0 82.22

Ca: Na: K = .73 75.8 23.27

AFM Ratio = 92.39

Sample=? CY85B K-FELDSPAR IN GMASS

ELEM	OX	STRUCT
Na2O	.31	.11
Al2O3	19.41	2.108
SiO2	62.29	5.741
K2O	14.06	1.653
CaO	.77	.076
TiO2	2.86	.193

Total 97.44 9.8871

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.13 5.98 89.89

AFM Ratio = 100

Sample=? CY85B K-FELDSPAR CRYSTAL INC.

ELEM	OX	STRUCT
Na2O	.23	.041
Al2O3	18.52	2.018
SiO2	64.5	5.964
K2O	15.82	1.867
CaO	.93	.092

Total 102.61 9.9808

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.6 2.05 93.35

AFM Ratio = 100

Sample=? CY87 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.11	.187
Al2O3	12.91	1.334
SiO2	75.86	6.652
K2O	9.26	1.036
CaO	.87	.081

TOTAL 100.2 9.293

CA: NA: K = 6.24 14.4 79.36

Sample=? CY87- K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
MgO	.41	.05
Al2O3	2.19	.209
SiO2	95.69	7.77
K2O	1.41	.145
FeO	.3	.02

TOTAL 100.3 8.197

CA: NA: K = 0 0 100

Sample=? CY87- K-FELDSPAR. OXNO.=? -16

ELEM	OX	STRUCT
MgO	.36	.044
Al2O3	4.86	.473
SiO2	90.81	7.509
K2O	3.31	.349
CaO	.35	.03
FeO	.33	.023

TOTAL 100.7 8.431

Sample=? CY87 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.08	.179
Al2O3	11.83	1.194
SiO2	79.88	6.842
K2O	5.64	.616
CaO	.63	.057
FeO	.96	.069

TOTAL 97.7 8.959

CA: NA: K = 6.78 21 72.23

Sample=? CY87 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.81	1.12
Al2O3	13.6	1.36
SiO2	78.53	6.664
K2O	.71	.076
CaO	.34	.03

TOTAL 98.8 9.252

CA: NA: K = 2.48 91.25 6.26

Sample=? CY87 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.84	.141
Al2O3	11.45	1.177
SiO2	76.84	6.701
K2O	7.5	.834
CaO	1.58	.147
TiO2	1.12	.073
FeO	.66	.047

TOTAL 98.1 9.123

CA: NA: K = 13.14 12.57 74.29

Sample=? CY88PLAGIOCLASE-PHENOCRYST OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.24	1.25
Al2O3	24.53	2.574
SiO2	60.97	5.428
K2O	.73	.083
CaO	6.28	.599
FeO	.27	.02

TOTAL 102.11 9.95399

MG/MG+FE= 0

CA: MG: FE = 96.77 0 3.23

CA: NA: K = 31 64.7 4.3

Sample=? CY88 ANOTHER PLAG. WIDE SCAN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.42	1.605
MgO	.43	.056
Al2O3	21.75	2.252
SiO2	65.59	5.762
K2O	.55	.062
CaO	2	.188
FeO	.24	.018

TOTAL 103 9.943

MG/MG+FE= 75.68

CA: MG: FE = 71.76 21.37 6.87

CA: NA: K = 10.13 86.52 3.34

Sample=? CY88PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.94	1.36
MgO	.48	.063
Al2O3	23	2.394
SiO2	64.15	5.667
K2O	2	.225
CaO	1.93	.183
FeO	.5	.037

TOTAL 101.73 9.929

MG/MG+FE= 63

CA: MG: FE = 64.66 22.26 13.07

CA: NA: K = 10.35 76.92 12.73

Sample=? CY88PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.06	1.218
MgO	.33	.044
Al2O3	24.49	2.566
SiO2	61.05	5.427
K2O	.75	.085
CaO	6.34	.604

TOTAL 101.34 9.94399

MG/MG+FE= 100

CA: MG: FE = 93.21 6.79 0

CA: NA: K = 31.67 63.87 4.46

Sample=? CY88 ABOVE REPEATED AREA SCAN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.16	1.236
Al2O3	24.55	2.577
SiO2	60.9	5.424
K2O	.78	.089
CaO	6.34	.605
FeO	.27	.02

TOTAL 101.07 9.95099

MG/MG+FE= 0

CA: MG: FE = 96.8 0 3.2

CA: NA: K = 31.35 64.04 4.61

Sample=? CY88-PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.56	1.138
MgO	.38	.051
Al2O3	25.58	2.696
SiO2	59.04	5.279
K2O	.64	.073
CaO	7.54	.723
FeO	.24	.018

TOTAL 102.14 9.978

MG/MG+FE= 73.91

CA: MG: FE = 91.29 6.44 2.27

CA: NA: K = 37.38 58.84 3.77

Sample=? CY89 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.87	1.178
Al2O3	24.17	2.521
SiO2	62.34	5.516
K2O	.81	.091
CaO	5.81	.551
Total	99.75	9.8577

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 30.27 64.73 5
AFM Ratio = 100

Sample=? CY89 ANOTHER FELDSPAR

ELEM	OX	STRUCT
Na2O	6.61	1.139
Al2O3	24.53	2.569
SiO2	61.47	5.461
K2O	.8	.091
CaO	6.42	.611
Total	100.03	9.8696

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 33.19 61.87 4.94
AFM Ratio = 100

Sample=? CY89 INC. IN ABOVE\?

ELEM	OX	STRUCT
Na2O	6.16	1.062
Al2O3	25.35	2.654
SiO2	60.57	5.38
K2O	.64	.073
CaO	7.28	.693
Total	99.61	9.8604

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 37.91 58.1 3.99
AFM Ratio = 100

Sample=? CY89 RIM OF ALTERED AMPHIBOLE BIOTITE?

ELEM	OX	STRUCT
Na2O	.79	.194
MgO	6.12	1.158
Al2O3	16.4	2.453
SiO2	54.8	6.953
K2O	6.33	1.024
CaO	.57	.077
FeO	14.81	1.571
Total	90.71	13.4296

Mg/Mg+Fe= 42.43
Ca: Mg: Fe = 2.74 41.27 55.99
Ca: Na: K = 5.95 14.98 79.07
AFM Ratio = 31.01

Sample=? CY91 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.05	.61
MgO	7.59	1.739
Al2O3	14.34	2.597
SiO2	37.56	5.771
K2O	2.92	.571
CaO	11.46	1.887
TiO2	2.45	.283
MnO	.41	.054
FeO	21.23	2.728
TOTAL	97.03	16.24

MG/MG+FE= 38.93
CA: MG: FE = 29.7 27.37 42.93
CA: NA: K = 61.51 19.88 18.61

Sample=? CY91 OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.87	.562
MgO	7.25	1.672
Al2O3	14.38	2.623
SiO2	36.88	5.707
K2O	3.05	.602
CaO	11.47	1.902
TiO2	2.4	.28
MnO	.46	.061
FeO	22.34	2.879
TOTAL	97.8	16.288

MG/MG+FE= 36.74
CA: MG: FE = 29.47 25.91 44.61
CA: NA: K = 62.04 19.33 18.63

Sample=? CY91AMPHIBOLE OXNO.=?

ELEM	OX	STRUCT
Na2O	2.02	.605
MgO	7.49	1.724
Al2O3	14.36	2.612
SiO2	37.03	5.713
K2O	3.02	.595
CaO	11.4	1.885
TiO2	2.52	.293
MnO	.41	.054
FeO	21.73	2.802
TOTAL	96.94	16.282

MG/MG+FE= 38.09
CA: MG: FE = 29.4 26.09 44.51
CA: NA: K = 61.1 19.61 19

Sample=? CY91 AMPHIBOLE OXNO

ELEM	OX	STRUCT
Na2O	1.7	.509
MgO	6.68	1.54
Al2O3	14.66	2.672
SiO2	37.07	5.733
K2O	2.98	.587
CaO	11.42	1.891
TiO2	2.4	.279
MnO	.45	.059
FeO	22.63	2.926
TOTAL	97.1	16.196

MG/MG+FE= 34.18
CA: MG: FE = 29.76 24.22 46.02
CA: NA: K = 63.62 17.[illegible] 1[illegible]

Sample=? CY91 AMPHIBOLE OXNO

ELEM	OX	STRUCT
Na2O	1.79	.535
MgO	7.74	1.775
Al2O3	14.02	2.543
SiO2	37.54	5.774
K2O	2.98	.584
CaO	11.66	1.921
TiO2	2.45	.284
MnO	.39	.05
FeO	21.41	2.75[illegible]
TOTAL	92.74	16.[illegible]

MG/MG+FE= 39.[illegible]
CA: MG: FE = 29.7[illegible] 27.[illegible] 4[illegible]
CA: NA: K = 63.[illegible] 17.[illegible] 19.[illegible]

Sample=? CY91 AMPHIBOLE OXNO.

ELEM	OX	STRUCT
Na2O	1.71	.518
MgO	6.97	1.387
Al2O3	13.02	2.74[illegible]
SiO2	36.34	5.667
K2O	3.1	.616
CaO	11.51	1.889
TiO2	2.1	.246
MnO	.37	049
FeO	24.07	3.139
TOTAL	96.39	16.[illegible]

MG/MG+FE= 30.6[illegible]
CA: MG: FE = 29.45 21.[illegible] 4[illegible]
CA: NA: K = 62.49 17.[illegible] 20.[illegible]

Sample=? CY912AMPH1 EDGE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.48	.425
MgO	7.73	1.702
Al2O3	13.83	2.409
SiO2	37.35	5.519
K2O	2.77	.522
CaO	11.66	1.845
TiO2	2.49	.276
MnO	.31	.039
FeO	22.38	2.488
TOTAL	95.1	15.225

MG/MG+FE= 40.62
CA: MG: FE = 30.57 28.2 41.23

ELEM	OX	STRUCT
Na2O	4.31	1.084
Al2O3	[illegible]	[illegible]
SiO2	61.5	5.449
MnO	[illegible]	[illegible]
CaO	4.69	.635
TOTAL	101.40	7.8[illegible]

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 33.32 60.29 4.[illegible]
AFM Ratio = 100

Sample=? CY91 CPX OXNO.=? -23

ELEM	OX	STRUCT
MgO	11.76	.653
Al2O3	4.8	.211
SiO2	47.92	1.785
CaO	22.46	.897
TiO2	1	.028
FeO	12.07	.338
TOTAL	100.29	3.912

MG/MG+FE= 65.89

CA: MG: FE = 47.51 34.59 17.9

Sample=? CY91 LLARGE AMPH. OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.52	.436
MgO	8.27	1.822
Al2O3	13.25	2.306
SiO2	37.71	5.571
K2O	2.87	.54
CaO	11.6	1.836
TiO2	2.45	.272
MnO	.37	.047
FeO	21.95	2.44
TOTAL	92.86	15.27

MG/MG+FE= 42.75

CA: MG: FE = 30.11 29.88 40.01

SAMPLE=? CY91 OXNO.=? -6

ELEM	OX	STRUCT
NA2O	.8	.058
MGO	10.58	.6
AL2O3	5.35	.239
SIO2	47.9	1.823
CAO	22.7	.925
TIO2	1.15	.032
CR2O3	.28	.008
FEO	11.27	.358
TOTAL	101	4.049

SAMPLE=? CY91 ZONED PYRCXENE OXNO.=? -6

ELEM	OX	STRUCT
NA2O	.92	.069
MGO	7.21	.42
AL2O3	7.99	.368
SIO2	44.11	1.723
CAO	22.16	.928
TIO2	1.4	.041
CR2O3	.39	.012
FEO	15.8	.516
TOTAL	100.6	4.079

SAMPLE=? CY91 REPEAT ABOVE CORE OXNO.=? -6

ELEM	OX	STRUCT
NA2O	1.08	.081
MGO	7.1	.412
AL2O3	8.09	.371
SIO2	44.43	1.732
CAO	22.12	.924
TIO2	1.28	.037
CR2O3	.29	.008
FEO	15.61	.508
TOTAL	103.4	4.079

Sample=? CY91 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.48	.437
MgO	8.44	1.913
Al2O3	13.79	2.473
SiO2	38.66	5.879
K2O	2.87	.556
CaO	12.2	1.988
TiO2	2.64	.301
MnO	.39	.05
FeO	19.53	2.484
TOTAL	93.43	16.081

MG/MG+FE= 43.51

CA: MG: FE = 31.14 29.96 38.9

CA: NA: K = 66.69 14.66 18.65

Sample=? CY91 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	9.6	.549
Al2O3	6.71	.303
SiO2	46.29	1.776
CaO	23.13	.951
TiO2	1.43	.041
MnO	.34	.011
FeO	12.52	.402
TOTAL	97.52	4.033

MG/MG+FE= 57.73

CA: MG: FE = 50 28.86 21.14

CA: NA: K = 100 0 0

Sample=? CY91 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.04	.079
MgO	6.68	.391
Al2O3	7.48	.347
SiO2	44.37	1.744
CaO	21.95	.924
TiO2	1.13	.034
MnO	.54	.018
FeO	16.8	.552
TOTAL	98.09	4.089

MG/MG+FE= 41.46

CA: MG: FE = 49.49 20.94 29.57

CA: NA: K = 92.12 7.88 0

Sample=? CY91 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.53	.039
MgO	8.82	.508
Al2O3	6.93	.316
SiO2	45.74	1.766
CaO	22.77	.942
TiO2	1.35	.039
MnO	.27	.009
FeO	13.61	.439
TOTAL	99.58	4.058

MG/MG+FE= 53.64

CA: MG: FE = 49.87 26.89 23.24

CA: NA: K = 96.02 3.98 0

Sample=? CY91 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	13.18	.739
Al2O3	2.25	.1
SiO2	51	1.918
CaO	23.56	.949
TiO2	.5	.014
FeO	9.52	.299
TOTAL	98.81	4.019

MG/MG+FE= 71.19

CA: MG: FE = 47.76 37.19 15.05

CA: NA: K = 100 0 0

Sample=? CY91 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.02	.075
MgO	10.79	.61
Al2O3	1.23	.055
SiO2	52.41	1.985
CaO	22.5	.913
Cr2O3	.38	.011
MnO	.39	.012
FeO	11.28	.357
TOTAL	98.67	4.018

MG/MG+FE= 63.08

CA: MG: FE = 48.56 32.45 18.99

CA: NA: K = 92.41 7.59 0

Sample=? CY91 PYX. OXNO.=? -6

ELEM	OX	STRUCT
MgO	8.44	.488
Al2O3	6.5	.297
SiO2	45.65	1.77
CaO	22.85	.949
TiO2	1.47	.043
MnO	.35	.011
FeO	14.73	.478
TOTAL	98.35	4.036

MG/MG+FE= 50.52

CA: MG: FE = 49.56 25.48 24.96

CA: NA: K = 100 0 0

CY91

Sample=? CY91 PYX. OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.73	.054
MgO	9.2	.528
Al2O3	6.65	.302
SiO2	46.08	1.775
CaO	22.72	.938
TiO2	1.35	.039
MnO	.39	.013
FeO	12.92	.416
TOTAL	103.39	4.065

MG/MG+FE= 55.93
CA: MG: FE = 49.84 28.06 22.1
CA: NA: K = 94.56 5.44 0

SAMPLE=? CY91 PYROXENE PHENOCRYST OXNO.=? -6

ELEM	OX	STRUCT
NA2O	.86	.063
MGO	10.4	.589
AL2O3	5.35	.239
SIO2	48.32	1.838
CAO	22.71	.925
TIO2	.92	.026
FEO	11.45	.364
TOTAL	100.5	4.048

SAMPLE=? CY91 GM. FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
NA2O	.53	.093
AL2O3	17.5	1.893
SIO2	66.06	6.065
K2O	14.67	1.718
CAO	1.23	.121

SAMPLE=? CY91 GM.FELS. DK. OXNO.=? -16

ELEM	OX	STRUCT
NA2O	9.56	1.627
MGO	.36	.047
AL2O3	20.88	2.161
SIO2	66.72	5.86
K2O	1.55	.174
CAO	.94	.088
TOTAL	99.7	9.96

SAMPLE=? CY91 GM. FELDS. LIGHT OXNO.=? -16

ELEM	OX	STRUCT
NA2O	10.85	1.843
MGO	.41	.054
AL2O3	19.35	1.997
SIO2	67.96	5.953
K2O	.35	.038
CAO	1.06	.099
TOTAL	100	9.987

SAMPLE=? CY91 ABOVE BEAM DEFOCUSSED OXNO.=? -16

ELEM	OX	STRUCT
NA2O	3.83	.673
AL2O3	17.88	1.913
SIO2	65.87	5.98
K2O	10.26	1.188
CAO	1.51	.146
TIO2	.67	.045
TOTAL	100.7	9.95

SAMPLE=? CY91 GM. LIGHT OXNO.=? -16

ELEM	OX	STRUCT
NA2O	.46	.081
AL2O3	17.55	1.899
SIO2	66.02	6.062
K2O	14.74	1.727
CAO	1.22	.119
TOTAL	99.8	9.891

SAMPLE=? CY91 GM.LIGHT OXNO.=? -16

ELEM	OX	STRUCT
NA2O	.53	.093
AL2O3	17.48	1.89
SIO2	66.19	6.073
K2O	14.71	1.721
CAO	1.08	.105
TOTAL	101	9.885

SAMPLE=? CY91 AMPHIBOLE PHENOCRYST OXNO.=? -23

ELEM	OX	STRUCT
NA2O	1.78	.529
MGO	7.59	1.736
AL2O3	14.34	2.592
SIO2	37.76	5.79
K2O	2.77	.542
CAO	12.02	1.975
TIO2	2.35	.271
FEO	21.41	2.745
TOTAL	96.8	16.183

CA: MG: FE = 30.59 26.89 42.52

SAMPLE=? CY91 PYROXENE? INCLUSION OXNO.=? -6

ELEM	OX	STRUCT
NA2O	.77	.057
MGO	7.59	.44
AL2O3	8.2	.376
SIO2	43.94	1.709
CAO	22.56	.94
TIO2	1.9	.055
CR2O3	.35	.01
FEO	14.68	.477
TOTAL	99.2	4.069

CA: MG: FE = 50.6 23.7 25.7

Sample=? CY91 ANOTHER PYROXENE

ELEM	OX	STRUCT
Na2O	.6	.044
MgO	11.68	.662
Al2O3	4.92	.22
SiO2	47.8	1.819
CaO	22.95	.936
TiO2	1.12	.032
FeO	10.94	.348
Total	99.01	4.0613

Mg/Mg+Fe= 65.54
Ca: Mg: Fe = 48.1 34.02 17.88
Ca: Na: K = 95.51 4.49 0
AFM Ratio = 9.82

Sample=? CY91 ANOTHER

ELEM	OX	STRUCT
Na2O	1.42	.105
MgO	8.74	.499
Al2O3	6.59	.298
SiO2	47.44	1.82
CaO	21.57	.886
TiO2	.67	.019
MnO	.44	.014
FeO	13.15	.422
Total	99.66	4.0643

Mg/Mg+Fe= 54.18
Ca: Mg: Fe = 49.03 27.41 23.56
Ca: Na: K = 89.4 10.6 0
AFM Ratio = 13.93

Sample=? CY91 ANOTHER

ELEM	OX	STRUCT
Na2O	1.02	.078
MgO	6.86	.401
Al2O3	8.45	.39
SiO2	43.79	1.718
CaO	21.83	.789
TiO2	1.13	.033
MnO	.37	.012
FeO	16.76	.55
Total	98.8	4.0925

Mg/Mg+Fe= 42.17
Ca: Mg: Fe = 48.87 21.56 29.57
Ca: Na: K = 92.1 7.9 0
AFM Ratio = 17.02

Sample=? CY91 ANOTHER

ELEM	OX	STRUCT
Na2O	.67	.049
MgO	10.88	.618
Al2O3	5.49	.247
SiO2	47.41	1.808
CaO	22.81	.932
TiO2	1.22	.035
FeO	11.52	.368
Total	99.46	4.0579

Mg/Mg+Fe= 62.68
Ca: Mg: Fe = 48.59 32.22 19.19
Ca: Na: K = 95.01 4.99 0
AFM Ratio = 11.13

Sample=? CY92 REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.28	.578
Al2O3	18.88	2.026
SiO2	65.4	5.956
K2O	11.55	1.342
CaO	.9	.087
TOTAL	100.07	9.989

CA: MG: FE = 100 0 0
CA: NA: K = 4.33 28.8 66.87

Sample=? CY92 PART OF ABOVE CRYSTAL OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.29	.581
Al2O3	18.57	1.996
SiO2	65.59	5.929
K2O	11.89	1.383
CaO	.64	.063
TOTAL	98.08	10.002

CA: MG: FE = 100 0 0
CA: NA: K = 3.11 28.66 68.23

Sample=? CY92 PLAGIOCLASE INC.

ELEM	OX	STRUCT
Na2O	8.2	1.41
Al2O3	22.77	2.382
SiO2	63.26	5.614
K2O	1.46	.165
CaO	4.32	.411
TOTAL	97.25	9.982

CA: MG: FE = 100 0 0
CA: NA: K = 20.69 71 8.31

Sample=? CY92 REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.24	1.417
Al2O3	22.75	2.379
SiO2	63.3	5.617
K2O	1.43	.162
CaO	4.28	.407
TOTAL	100.29	9.982

CA: MG: FE = 100 0 0
CA: NA: K = 20.49 71.35 8.16

Sample=? CY92 EDGE OR RIM OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.71	.653
Al2O3	18.59	1.992
SiO2	65.84	5.983
K2O	11.03	1.279
CaO	.83	.08
TOTAL	102.42	9.987

CA: MG: FE = 100 0 0
CA: NA: K = 3.98 32.46 63.57

Sample=? CY92 ABOVE ANOTHER PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.56	1.473
Al2O3	22.37	2.34
SiO2	63.62	5.646
K2O	1.47	.166
CaO	3.99	.379
TOTAL	100.24	10.004

CA: MG: FE = 100 0 0
CA: NA: K = 18.78 72.99 8.23

Sample=? CY92 FELDSPAR PHENOCRYST SMALL OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.37	1.436
Al2O3	20.77	2.166
SiO2	66.14	5.852
K2O	2.87	.324
CaO	1.44	.137
FeO	.41	.03
TOTAL	102.11	9.945

MG/MG+FE= 0
CA: MG: FE = 82.04 0 17.96
CA: NA: K = 7.22 75.7 17.08

~~Sample=? SAME~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	4.75	.831
~~Al2O3~~	~~19.23~~	~~2.044~~
SiO2	65.94	5.947
~~K2O~~	~~8.94~~	~~1.028~~
CaO	1.14	.111
~~Total~~	~~99.6~~	~~9.9605~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 5.63 42.18 52.18~~

Sample=? CY92-PLAG. PHENOCRYST OXNO.=? -16

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	7.23	1.241
~~Al2O3~~	~~23.01~~	~~2.401~~
SiO2	63.6	5.632
~~K2O~~	~~1.48~~	~~.167~~
CaO	4.55	.431
~~Total~~	~~98.79~~	~~9.8719~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 23.44 67.48 9.08~~

~~Sample=? CY92-PLAG. ANOTHER PART~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	5.83	1.011
~~Al2O3~~	~~26.4~~	~~2.783~~
SiO2	58.82	5.26
~~K2O~~	~~.66~~	~~.075~~
CaO	7.95	.762
~~Total~~	~~99.29~~	~~9.8912~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 41.23 54.71 4.06~~

~~Sample=? CY92 K-FELDSPAR PHENOCRYST~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	3.18	.561
~~Al2O3~~	~~18.71~~	~~2.006~~
SiO2	65.62	5.971
~~K2O~~	~~11.43~~	~~1.327~~
CaO	1.07	.104
~~Total~~	~~99.49~~	~~9.9691~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 5.22 28.16 66.62~~

~~Sample=? CY92 OVERGROWTH ON ABOVE~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	7.28	1.249
~~Al2O3~~	~~23.24~~	~~2.424~~
SiO2	63.4	5.612
~~K2O~~	~~1.3~~	~~.146~~
CaO	4.67	.443
~~Total~~	~~99.73~~	~~9.8738~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 24.1 67.95 7.94~~

~~Sample=? CY92 INC. IN K-FELDSPAR~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	7.25	1.245
~~Al2O3~~	~~23.34~~	~~2.436~~
SiO2	63.22	5.598
K2O	1.45	.163
CaO	4.68	.444
Total	97.17	9.8876

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 23.97 67.22 8.8

~~Sample=? CY92-PLAG. PHENOCRYST\?~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	5.95	1.029
~~Al2O3~~	~~26.13~~	~~2.747~~
SiO2	59.4	5.299
~~K2O~~	~~.76~~	~~.087~~
CaO	7.55	.722
~~Total~~	~~98.02~~	~~9.8847~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 39.28 55.98 4.73~~

~~Sample=? CY92 ANOTHER PLAG. CRYSTAL~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	7.29	1.251
~~Al2O3~~	~~23.04~~	~~2.404~~
SiO2	63.6	5.63
~~K2O~~	~~1.45~~	~~.164~~
CaO	4.51	.428
~~Total~~	~~97.39~~	~~9.8757~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 23.22 67.88 8.9~~

~~Sample=? CY92 PLAGIOCLASE PHENOCRYST~~

~~ELEM~~	~~OX~~	~~STRUCT~~
Na2O	7.21	1.24
~~Al2O3~~	~~23.43~~	~~2.449~~
SiO2	63.02	5.588
~~K2O~~	~~1.28~~	~~.145~~
CaO	4.82	.458
~~Total~~	~~98~~	~~9.88~~

Ca: Mg: Fe = 100 0 0
~~Ca: Na: K = 24.85 67.28 7.87~~

Sample=? CY92-AGAIN-NEW-SPECTRUM

ELEM	OX	STRUCT
Na2O	7.1	1.217
Al2O3	23.52	2.451
SiO2	63.24	5.592
K2O	1.28	.144
CaO	4.84	.459
Total	98.6	9.8631

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 25.22 66.87 7.91

Sample=? CY92 FELDSPAR MANTLING ABOVE

ELEM	OX	STRUCT
Na2O	2.99	.527
Al2O3	18.87	2.025
SiO2	65.51	5.963
K2O	11.61	1.348
CaO	1.02	.099
Total	98.74	9.9626

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.02 26.7 68.29

Sample=? CY92 PLAG. PHENOCRYST

ELEM	OX	STRUCT
Na2O	6.2	1.07
Al2O3	25.04	2.629
SiO2	60.78	5.413
K2O	1.32	.149
CaO	6.5	.62
Total	98.83	9.8819

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 33.71 58.18 8.1

Trace Elements? Y

Sample=? CY92 K-FELDSPAR

ELEM	OX	STRUCT
Na2O	4.04	.711
Al2O3	19.31	2.063
SiO2	65.34	5.922
K2O	9.97	1.153
CaO	1.33	.129
Total	103.17	9.9783

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 6.47 35.67 57.85

Sample=? SAME

ELEM	OX	STRUCT
Na2O	4.02	.707
Al2O3	19.31	2.063
SiO2	65.37	5.923
K2O	9.96	1.152
CaO	1.33	.129
Total	99.92	9.9744

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 6.49 35.56 57.95

Sample=? CY92 PLAG. PHENOCRYST

ELEM	OX	STRUCT
Na2O	7.67	1.317
Al2O3	22.39	2.338
SiO2	64.14	5.682
K2O	1.69	.191
CaO	3.94	.374
Total	100.56	9.9025

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 19.87 69.98 10.15

Sample=? CY92 K-FELDSPAR

ELEM	OX	STRUCT
Na2O	2.19	.39
Al2O3	18.41	1.989
SiO2	65.23	5.979
K2O	13.24	1.548
CaO	.92	.09
Total	100.41	9.9958

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.44 19.23 76.33

Sample=? CY92 PLAG. PHENOCRYST

ELEM	OX	STRUCT
Na2O	7.18	1.231
Al2O3	23.02	2.4
SiO2	63.73	5.637
K2O	1.47	.166
CaO	4.52	.428
Total	99.75	9.8619

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 23.45 67.45 9.1

Sample=? CY92 FELDSPAR PHENOCRYST

ELEM	OX	STRUCT
Na2O	7.31	1.252
Al2O3	22.93	2.388
SiO2	63.95	5.651
K2O	1.48	.167
CaO	4.29	.406
Total	100.41	9.8645

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 22.25 68.6 9.15

AFM Ratio = 100

Sample=? CY92 ANOTHER PHENOCRYST

ELEM	OX	STRUCT
Na2O	5.61	.968
Al2O3	26.19	2.746
SiO2	59.78	5.319
K2O	1.07	.122
CaO	7.33	.699
Total	100.39	9.8534

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 39.07 54.11 6.82

AFM Ratio = 100

Sample=? CY92 ANOTHER PHENOCRYST

ELEM	OX	STRUCT
Na2O	7.17	1.23
Al2O3	23.1	2.408
SiO2	63.67	5.631
K2O	1.46	.165
CaO	4.51	.428
Total	99.48	9.8616

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 23.48 67.47 9.05

Sample=? CY92 ANOTHER

ELEM	OX	STRUCT
Na2O	7.08	1.215
Al2O3	23.1	2.407
SiO2	63.64	5.628
K2O	1.48	.167
CaO	4.67	.443
Total	101.81	9.8597

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 24.27 66.58 9.15

Sample=? CY92 ANOTHER

ELEM	OX	STRUCT
Na2O	7.23	1.241
Al2O3	23.29	2.429
SiO2	63.41	5.612
K2O	1.44	.163
CaO	4.54	.43
Total	100.62	9.8753

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 23.45 67.67 8.89

Sample=? CY92 ANOTHER

ELEM	OX	STRUCT
Na2O	7.21	1.237
Al2O3	23.21	2.419
SiO2	63.53	5.619
K2O	1.36	.154
CaO	4.62	.438
Total	98.45	9.8666

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 23.95 67.63 8.42

Sample=? CY92 K-FELDSPAR PHENOCRYST

ELEM	OX	STRUCT	OXNO.=? 16
Na2O	2.85	.505	
Al2O3	18.72	2.015	
SiO2	65.2	5.957	
K2O	12.12	1.412	
CaO	1.07	.105	
Total	99.1	9.9942	

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.19 24.98 69.83

AFM Ratio = 100

Sample=? CY92 PLAG. PHENOCRYST

ELEM	OX	STRUCT
Na2O	7.23	1.245
Al2O3	23.25	2.435
SiO2	62.97	5.596
K2O	1.34	.152
CaO	4.79	.457
Total	98.33	9.885

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 24.65 67.15 8.2

AFM Ratio = 100

Sample=? CY92 K-FELDSPAR PHENOCRYST

ELEM	OX	STRUCT
Na2O	3.36	.592
Al2O3	18.7	2.003
SiO2	65.75	5.975
K2O	11.15	1.292
CaO	1.05	.103
Total	98.05	9.9653

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.18 29.79 65.02
AFM Ratio = 100

Sample=? CY92 K-SPAR, PHENOCRYST

ELEM	OX	STRUCT
Na2O	4.66	.815
Al2O3	19.66	2.09
SiO2	65.48	5.906
K2O	8.55	.984
CaO	1.59	.154
Total	98.7	9.9481

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 7.89 41.73 50.38
AFM Ratio = 100

Sample=? CY92 ANOTHER K- SPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.28	.58
Al2O3	18.7	2.009
SiO2	65.43	5.962
K2O	11.54	1.342
CaO	1.04	.102
Total	99.83	9.9945

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.04 28.66 66.3
AFM Ratio = 100

Sample=? CY92 ANOTHER LATH

ELEM	OX	STRUCT
Na2O	6.38	1.102
Al2O3	19.67	2.066
SiO2	66.75	5.947
K2O	5.63	.64
CaO	1.43	.136
Total	97.75	9.8916

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 7.24 58.68 34.08
AFM Ratio = 100

Sample=? CY92 ANOTHER LATH OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.59	.973
Al2O3	19.29	2.04
SiO2	66.47	5.964
K2O	7.41	.848
CaO	1.06	.102
Total	99.52	9.927

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 5.3 50.6 44.1
AFM Ratio = 100

Sample=? CY96 EDGE OF FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.09	1.056
Al2O3	26.12	2.754
SiO2	58.98	5.276
K2O	.42	.048
CaO	7.98	.765
Total	102.52	9.8992

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 40.93 56.5 2.57
AFM Ratio = 100

Sample=? CY96 REPEAT ABOVE\

ELEM	OX	STRUCT
Na2O	3.71	.649
Al2O3	31.03	3.298
SiO2	56.37	5.083
K2O	7.26	.836
CaO	1.32	.128
FeO	.24	.018
Total	100.73	10.0108
Mg/Mg+Fe=		0

Ca: Mg: Fe = 87.67 0 12.33
Ca: Na: K = 7.94 40.24 51.83
AFM Ratio = 98.92

Sample=? cy96 feldspar mantling above\

ELEM	OX	STRUCT
Na2O	8.6	1.463
Al2O3	21.8	2.254
SiO2	66.02	5.792
K2O	.6	.067
CaO	2.87	.269
Total	97.58	9.8455

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 14.95 81.32 3.72
AFM Ratio = 100

Sample=? cy96 again another spot\

ELEM	OX	STRUCT
Na2O	9.36	1.588
Al2O3	20.75	2.139
SiO2	67.57	5.911
K2O	.52	.058
CaO	1.56	.147
Total	98.86	9.8423

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 8.2 88.57 3.23
AFM Ratio = 100

Sample=? cy96 pyroxene part of inclusion?

ELEM	OX	STRUCT	
Na2O	.24	.017	OXNO.=? -6
MgO	14.99	.832	
Al2O3	1.24	.054	
SiO2	52.08	1.939	
K2O	.23	.011	
CaO	24.73	.986	
TiO2	.31	.009	
FeO	6.1	.19	
Total	99.55	4.0391	
Mg/Mg+Fe=		81.41	

Ca: Mg: Fe = 49.1 41.43 9.46
Ca: Na: K = 97.24 1.68 1.08
AFM Ratio = 2.57

Sample=? cy96 feldspar core?? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.19	1.561
Al2O3	20.69	2.137
SiO2	67.42	5.907
K2O	.79	.089
CaO	1.65	.155
Total	99.7	9.8491

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 8.59 86.48 4.93
AFM Ratio = 100

Sample=? cy96 another grain core material

ELEM	OX	STRUCT
Na2O	5.95	1.029
Al2O3	26.41	2.775
SiO2	59.04	5.264
K2O	.52	.059
CaO	8.01	.765
Total	98.02	9.8926

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 41.28 55.53 3.18
AFM Ratio = 100

Sample=? cy96 another spot

ELEM	OX	STRUCT
Na2O	7.85	1.343
Al2O3	23.07	2.401
SiO2	63.9	5.642
K2O	.62	.069
CaO	4.31	.408
Total	99.23	9.8637

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 22.42 73.79 3.79
AFM Ratio = 100

Sample=? cy96 feldspar about above\

ELEM	OX	STRUCT
Na2O	9.32	1.576
Al2O3	19.74	2.028
SiO2	69.17	6.029
K2O	1.29	.144
CaO	.43	.04
Total	98.57	9.8169

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.27 89.55 8.18
AFM Ratio = 100

Sample=? cy96 rim feldspar

ELEM	OX	STRUCT
Na2O	.32	.058
Al2O3	17.87	1.958
SiO2	64.38	5.982
K2O	16.51	1.957
CaO	.92	.091
Total	98.56	10.0463

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.32 2.75 92.92

AFM Ratio = 100

Sample=? cy96 clear material

ELEM	OX	STRUCT
Na2O	8.63	1.474
Al2O3	21.98	2.283
SiO2	65.46	5.767
K2O	.48	.054
CaO	2.93	.277
Total	100.01	9.855

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 15.35 81.66 2.99

AFM Ratio = 100

Sample=? cy96 another

ELEM	OX	STRUCT
Na2O	8.91	1.515
Al2O3	21.31	2.202
SiO2	66.68	5.846
K2O	.7	.078
CaO	2.21	.207
Total	98.9	9.8493

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 11.5 84.17 4.33

AFM Ratio = 100

Sample=? cy96 another grain

ELEM	OX	STRUCT
Na2O	9.09	1.54
Al2O3	21.03	2.165
SiO2	67.44	5.893
K2O	.56	.063
CaO	1.76	.165
Total	98.54	9.8264

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 9.33 87.1 3.56

AFM Ratio = 100

Sample=? cy96 core of grain

ELEM	OX	STRUCT
Na2O	8.11	1.385
Al2O3	22.72	2.359
SiO2	64.57	5.686
K2O	.49	.055
CaO	3.93	.371
Total	98.75	9.8551

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 20.49 76.48 3.04

AFM Ratio = 100

Sample=? cy96 material mantling above

ELEM	OX	STRUCT
Na2O	.43	.078
Al2O3	17.84	1.956
SiO2	64.24	5.975
K2O	16.42	1.948
CaO	1.02	.102
Total	100.66	10.0599

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.79 3.67 91.54

AFM Ratio = 100

Sample=? cy96 core of crystal

ELEM	OX	STRUCT
Na2O	8.13	1.388
Al2O3	22.74	2.362
SiO2	64.55	5.687
K2O	.58	.065
CaO	3.77	.356
Total	99.04	9.8585

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 19.68 76.73 3.59

AFM Ratio = 100

Sample=? cy96 material mantling above

ELEM	OX	STRUCT
Na2O	8.17	1.397
Al2O3	22.47	2.337
SiO2	64.56	5.695
K2O	.82	.093
CaO	3.82	.361
Total	97.84	9.8821

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 19.5 75.47 5.02

AFM Ratio = 100

Sample=? CY96 PYROXENE IN LARGE INCLUSION OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.62	.859
Al2O3	1.15	.05
SiO2	53.05	1.956
CaO	24.46	.966
TiO2	.42	.012
FeO	5.29	.163
TOTAL	100.85	4.006

MG/MG+FE= 84.05

CA: MG: FE = 48.59 43.21 8.2

CA: NA: K = 100 0 0

Sample=? CY96 MAGNETITE OXNO.=? -8

ELEM	OX	STRUCT
MgO	.76	.105
Al2O3	1.38	.15
SiO2	.47	.044
TiO2	.63	.044
Cr2O3	.22	.016
MnO	.28	.022
FeO	96.24	7.447
TOTAL	99.36	7.828

MG/MG+FE= 1.39

CA: MG: FE = 0 1.39 98.61

Sample=? CY96PYROXENE FROM INCLUSION OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.04	.832
Al2O3	1.34	.059
SiO2	52.35	1.942
CaO	24.33	.967
TiO2	.5	.014
FeO	6.45	.2
TOTAL	103.04	4.014

MG/MG+FE= 80.62

CA: MG: FE = 48.37 41.62 10.01

CA: NA: K = 100 0 0

Sample=? CY96PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.07	.833
Al2O3	1.19	.052
SiO2	52.54	1.947
CaO	24.46	.971
TiO2	.57	.016
FeO	6.18	.19
TOTAL	99.94	4.01

MG/MG+FE= 81.35

CA: MG: FE = 48.67 41.75 9.57

CA: NA: K = 100 0 0

Sample=? CY96FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.88	1.682
Al2O3	21.2	2.194
SiO2	66.19	5.812
K2O	.31	.035
CaO	2.42	.228
TOTAL	100.7	9.951

CA: MG: FE = 100 0 0

CA: NA: K = 11.72 86.48 1.8

Sample=? CY96PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.02	.147
MgO	12.12	.872
Al2O3	4.11	.183
SiO2	51.21	1.918
K2O	.6	.029
CaO	11.68	.469
MnO	.43	.014
FeO	14.29	.448
TOTAL	99.95	4.08

MG/MG+FE= 66.06

CA: MG: FE = 26.22 48.74 25.04

CA: NA: K = 72.71 22.79 4.5

CY96,97

Sample=? CY96 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.99	1.705
Al2O3	21.48	2.239
SiO2	65.57	5.772
K2O	.54	.061
CaO	2.41	.227
TOTAL	101.4	9.994

CA: MG: FE = 100 0 0
CA: NA: K = 11.39 85.55 3.06

Sample=? CY96 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.47	1.786
Al2O3	21.69	2.248
SiO2	65.48	5.757
CaO	2.35	.221
TOTAL	100.54	10.012

CA: MG: FE = 100 0 0
CA: NA: K = 11.01 88.99 0

Sample=? CY96 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.01	.181
Al2O3	18.2	1.98
SiO2	64.8	5.982
K2O	15.13	1.782
CaO	.87	.086
TOTAL	100.57	10.011

CA: MG: FE = 100 0 0
CA: NA: K = 4.2 8.83 86.97

Sample=? CY96\? PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.63	.119
MgO	12.72	.713
SiO2	53.59	2.015
CaO	21.27	.857
MnO	.7	.022
FeO	10.1	.318
TOTAL	99.99	4.044
MG/MG+FE=		69.16

CA: MG: FE = 45.39 37.76 16.84
CA: NA: K = 87.81 12.19 0

Sample=? CY96 MAGNETITE OXNO.=? -8

ELEM	OX	STRUCT
MgO	.85	.115
Al2O3	1.3	.14
SiO2	1.28	.117
TiO2	1.47	.1
Cr2O3	.32	.023
MnO	.28	.022
FeO	94.49	7.185
TOTAL	96.68	7.702
MG/MG+FE=		1.59

CA: MG: FE = 0 1.58 98.42

Sample=? CY9o PYROXENE INC. OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.54	.858
Al2O3	1.32	.058
SiO2	52.39	1.94
CaO	24.33	.965
TiO2	.45	.013
FeO	5.96	.184
TOTAL	102.82	4.015
MG/MG+FE=		82.34

CA: MG: FE = 48.08 42.75 9.17
CA: NA: K = 32.77 2.72 64.52

Sample=? CY96 ANOTHER PYROXENE \ OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.06	.832
Al2O3	1.53	.067
SiO2	52.45	1.944
CaO	24.02	.954
TiO2	.45	.013
FeO	6.48	.201
TOTAL	102.47	4.011
MG/MG+FE=		80.54

CA: MG: FE = 48.01 41.87 10.12
CA: NA: K = 32.53 2.73 64.76

Sample=? CY96 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.21	1.231
Al2O3	24.14	2.605
SiO2	64.34	5.528
K2O	.78	.092
CaO	4.55	.429
TOTAL	97.95	9....1
MG/MG+FE=		80.54

CA: MG: FE = 29.34 56.91 13.75
CA: NA: K = 24.54 70.42 5.03

Sample=? CY96 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.9	1.501
Al2O3	21.26	2.163
SiO2	67.31	5.678
K2O	.39	.043
CaO	2.04	.192
TOTAL	98.63	9.802
MG/MG+FE=		80.54

CA: MG: FE = 15.67 67.92 16.41
CA: NA: K = 11.0... 86.49 2.47

Sample=? CY96 ANOTHER FELDSPAR\ OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.28	1.239
Al2O3	23.34	2.414
SiO2	64.5	5.6...
K2O	.51	.057
CaO	4.38	.41...
TOTAL	100.99	9.762
MG/MG+FE=		80.54

CA: MG: FE = 28.51 57.58 13.91
CA: NA: K = 24.12 72.54 3.34

Sample=? CY96 ANOTHERFELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.1	1.376
Al2O3	22.37	2.311
SiO2	65.61	5.749
K2O	.52	.058
CaO	3.4	.319
TOTAL	101.45	9.813
MG/MG+FE=		80.54

CA: MG: FE = 23.59 61.54 14.87
CA: NA: K = 18.2 78.49 3.31

Sample=? CY97

ELEM	OX	STRUCT
Na2O	1.24	.223
Al2O3	17.91	1.953
SiO2	64.67	5.983
K2O	15.25	1.8
CaO	.93	.092
Total	99.83	10.0514

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.35 10.54 85.11
AFM Ratio = 100

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.62	1.139
Al2O3	19.18	2.006
SiO2	67.87	6.022
K2O	5.71	.647
CaO	.58	.055
Total	98.84	9.8684

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.99 61.87 35.14
AFM Ratio = 100

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.9	.686
Al2O3	18.07	1.935
SiO2	66.4	6.032
K2O	10.76	1.247
CaO	.68	.067
Total	97.77	9.9671

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.35 34.3 62.35
AFM Ratio = 100

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.04	.366
Al2O3	18.08	1.971
SiO2	64.39	5.957
K2O	14.45	1.706
CaO	.94	.093
Total	99.49	10.0935

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.3 16.91 78.8

AFM Ratio = 100

Sample=? CY97 K- FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.66	.297
Al2O3	17.86	1.943
SiO2	64.9	5.989
K2O	14.57	1.715
CaO	1.01	.1
Total	99.57	10.0453

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.73 14.06 81.2

AFM Ratio = 100

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.04	.712
Al2O3	18.88	2.02
SiO2	65.59	5.952
K2O	10.32	1.195
CaO	1.16	.113
Total	98.01	9.9911

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.59 35.25 59.16

AFM Ratio = 100

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.59	.462
Al2O3	18.06	1.953
SiO2	65.43	6.003
K2O	13.16	1.54
CaO	.65	.064
Total	97.63	10.0215

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.1 22.36 74.54

AFM Ratio = 100

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.24	.574
Al2O3	18.13	1.95
SiO2	65.81	6.006
K2O	12.04	1.401
CaO	.77	.076
Total	98.12	10.0068

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.71 27.99 68.31

AFM Ratio = 100

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.22	.396
Al2O3	17.96	1.944
SiO2	65.39	6.005
K2O	13.67	1.602
CaO	.75	.073
Total	97.82	10.0212

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.52 19.12 77.35

AFM Ratio = 100

Sample=? CY-97\? MAGNETITE OXNO.=? -4

ELEM	OX	STRUCT
MgO	.71	.049
Al2O3	1.04	.057
TiO2	1.57	.055
Cr2O3	.32	.012
MnO	1.01	.04
FeO	95.34	3.698
TOTAL	100.51	3.911

Sample=? SAME OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.67	.048
MgO	16.03	.87
Al2O3	5.29	.227
SiO2	51.7	1.881
CaO	20.89	.814
TiO2	.57	.016
Cr2O3	.85	.024
FeO	3.99	.121
TOTAL	100.81	4.001

Sample=? CY97K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.55	.099
Al2O3	18.39	2.008
SiO2	64.26	5.955
K2O	15.95	1.886
CaO	.85	.085
TOTAL	102.8	10.033

CA: MG: FE = 100 0 0

CA: NA: K = 4.11 4.78 91.11

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.6	.463
Al2O3	18.67	2.021
SiO2	64.71	5.943
K2O	13.24	1.551
CaO	.8	.078
TOTAL	103.37	10.056

CA: MG: FE = 100 0 0

CA: NA: K = 3.73 22.13 74.14

Sample=? CY97 K-FELDSPAR

ELEM	OX	STRUCT
Na2O	3.09	.548
Al2O3	18.82	2.03
SiO2	64.88	5.939
K2O	12.43	1.452
CaO	.78	.077
TOTAL	103.34	10.046

CA: MG: FE = 100 0 0

CA: NA: K = 3.71 26.38 69.9

Sample=? CY97 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.93	1.704
Al2O3	22.47	2.343
SiO2	63.83	5.647
K2O	.42	.048
CaO	3.34	.317
TOTAL	101.7	10.059

CA: MG: FE = 100 0 0

CA: NA: K = 15.32 82.36 2.3

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	18.37	2.002
SiO2	64.65	5.979
K2O	14.11	1.901
CaO	.67	.086
TOTAL	100.98	9.968

CA: MG: FE = 100 0 0

CA: NA: K = 4.33 0 95.67

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.13	.202
Al2O3	18.33	1.992
SiO2	64.86	5.979
K2O	14.85	1.75
CaO	.6	.079
TOTAL	100.54	10.002

CA: MG: FE = 100 0 0

CA: NA: K = 3.89 9.95 86.16

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.72	.484
Al2O3	18.52	1.929
SiO2	63.16	5.967
K2O	12.83	1.499
CaO	.77	.076
TOTAL	101.22	10.025

CA: MG: FE = 100 0 0

CA: NA: K = 3.69 23.51 72.8

CY97

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.44	1.294
Al2O3	19.08	2.018
SiO2	66.34	5.951
K2O	6.75	.772
CaO	.41	.039
TOTAL	102.8	10.074

CA: MG: FE = 100 0 0

CA: NA: K = 1.85 61.47 36.67

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.41	.604
Al2O3	18.76	2.021
SiO2	65.1	5.948
K2O	12.02	1.401
CaO	.7	.068
TOTAL	102.26	10.042

CA: MG: FE = 100 0 0

CA: NA: K = 3.28 29.14 67.58

Sample=? CY97 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.68	1.658
Al2O3	22.52	2.346
SiO2	64	5.656
K2O	.49	.056
CaO	3.29	.311
TOTAL	99.96	10.027

CA: MG: FE = 100 0 0

CA: NA: K = 15.36 81.88 2.77

Sample=? CY97 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.72	1.668
Al2O3	22.52	2.349
SiO2	63.75	5.641
K2O	.52	.058
CaO	3.48	.33
TOTAL	100.14	10.046

CA: MG: FE = 100 0 0

CA: NA: K = 16.05 81.13 2.82

Sample=? CY97 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	12.8	.758
Al2O3	16.33	.765
SiO2	34.89	1.465
K2O	9.88	.501
CaO	.5	.021
TiO2	4.04	.121
MnO	.7	.023
FeO	18.86	.627
TOTAL	99.31	4.281

MG/MG+FE= 54.73

CA: MG: FE = 1.49 53.91 44.59

CA: NA: K = 4.02 0 95.98

Sample=? PLAGIOCLASE NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.04	1.718
Al2O3	22.13	2.302
SiO2	64.56	5.698
K2O	.39	.043
CaO	2.9	.274
TOTAL	98.82	10.035

CA: MG: FE = 100 0 0

CA: NA: K = 13.46 84.42 2.11

Sample=? CY97 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.53	.451
Al2O3	18.48	1.998
SiO2	65.05	5.947
K2O	13.18	1.542
CaO	.77	.076
TOTAL	99.3	10.034

CA: MG: FE = 100 0 0

CA: NA: K = 3.67 21.8 74.53

Sample=? CY97 REPEAT ABOVE AMPHIBOLE AS BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	12.8	1.391
Al2O3	16.27	1.398
SiO2	36.82	2.684
K2O	10.03	.933
CaO	.48	.037
TiO2	4.09	.224
MnO	.76	.047
FeO	18.74	1.143
TOTAL	96.55	7.857

MG/MG+FE= 54.89

CA: MG: FE = 1.44 54.1 44.46

CA: NA: K = 3.81 0 96.19

Sample=? CY97 REPEAT CORE BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
Na2O	1.27	.178
MgO	11.87	1.279
Al2O3	16.63	1.417
SiO2	38.31	2.769
K2O	9.17	.845
CaO	.62	.048
TiO2	3.32	.18
MnO	.77	.047
FeO	18.06	1.092
TOTAL	97.75	7.855

MG/MG+FE= 53.94

CA: MG: FE = 1.98 52.87 45.14

CA: NA: K = 4.48 16.62 78.9

Sample=? CY97 CORE BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
Na2O	2.44	.335
MgO	10.79	1.139
Al2O3	16.57	1.382
SiO2	41.74	2.953
K2O	8.46	.763
CaO	.7	.053
TiO2	2.9	.154
MnO	.71	.043
FeO	15.68	.928
TOTAL	96.88	7.75

MG/MG+FE= 55.1

CA: MG: FE = 2.5 53.73 43.77

CA: NA: K = 4.6 29.11 66.29

Sample=? CY97 PLAGIOCLASE

ELEM	OX	STRUCT
Na2O	10.1	1.729
Al2O3	22.35	2.327
SiO2	64.24	5.623
K2O	.39	.043
CaO	2.92	.277
TOTAL	100.74	10.049

CA: MG: FE = 100 0 0

CA: NA: K = 13.52 84.38 2.1

Sample=? CY97 ANOTHER IN CONTACT WITH BIOTITE ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.71	1.661
Al2O3	22.49	2.339
SiO2	64.24	5.67
K2O	.45	.05
CaO	3.12	.295
TOTAL	100.81	10.015

CA: MG: FE = 100 0 0

CA: NA: K = 14.71 82.8 2.49

Sample=? CY97 BIOTITE AGAIN OXNO.=? -11

ELEM	OX	STRUCT
MgO	11.87	1.298
Al2O3	16.7	1.444
SiO2	35.92	2.635
K2O	9.76	.913
CaO	.53	.042
TiO2	3.4	.187
MnO	.77	.048
FeO	19.75	1.211
TOTAL	97.26	7.851

MG/MG+FE= 51.73

CA: MG: FE = 1.65 50.88 47.47

CA: NA: K = 4.4 0 95.6

CY98A,102,103,105

Sample=? CY98A FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
MgO	1.03	.141
Al2O3	20.2	2.183
SiO2	63.51	5.823
K2O	13.77	1.61
CaO	.88	.087
FeO	.59	.045
TOTAL	99.58	9.889
MG/MG+FE=		75.81
CA: MG: FE =	31.87	51.65 16.48
CA: NA: K =	5.13	0 94.87

Sample=? CY98A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
MgO	.83	.117
Al2O3	18.33	2.043
SiO2	60.54	5.724
K2O	15.29	1.844
CaO	.85	.086
TiO2	.58	.042
FeO	3.6	.285
TOTAL	100.11	10.141
MG/MG+FE=		29.1
CA: MG: FE =	17.62	23.98 58.4
CA: NA: K =	4.46	0 95.54

Sample=? CY98A ILMENITE OR TI-MAGNETITE OXNO.=? -12

ELEM	OX	STRUCT
MgO	1.31	.261
Al2O3	1.76	.277
TiO2	5.45	.548
Cr2O3	.23	.025
MnO	1.27	.143
FeO	89.98	10.048
TOTAL	100.11	11.302
MG/MG+FE=		2.53
CA: MG: FE =	0	2.53 97.47

Sample=? CY98A ANOTHER MELANITE OXNO.=? -24

ELEM	OX	STRUCT
MgO	.7	.182
Al2O3	1.95	.402
SiO2	32.07	5.613
CaO	31.73	5.952
TiO2	9.52	1.254
Cr2O3	.23	.032
MnO	.59	.088
FeO	23.22	3.399
TOTAL	101.46	16.922
MG/MG+FE=		5.08
CA: MG: FE =	62.44	1.91 35.66
CA: NA: K =	75.71	24.29 0

Sample=? CY102 K-FELDSPAR OXNO.=? -11

ELEM	OX	STRUCT
Na2O	8.11	1.396
Al2O3	20.03	2.094
SiO2	66.68	5.915
K2O	4.17	.472
CaO	1.01	.096
TOTAL	97.72	9.973
CA: MG: FE =	100	0 0
CA: NA: K =	4.89	71.08 24.03

Sample=? CY102 BIOTITE OXNO.=? -16

ELEM	OX	STRUCT
MgO	16.13	1.736
Al2O3	13.53	1.151
SiO2	39.19	2.828
K2O	10.22	.941
CaO	.46	.036
TiO2	2.92	.158
FeO	17.56	1.06
TOTAL	92.2	7.91
MG/MG+FE=		62.09
CA: MG: FE =	1.27	61.3 37.43
CA: NA: K =	3.68	0 96.32

Sample=? CY103 PYROXENE OXNO.=? -66

ELEM	OX	STRUCT
Na2O	1.68	.126
MgO	9.65	.849
Al2O3	.87	.04
SiO2	53.22	1.976
CaO	21.03	.67
MnO	.87	.028
FeO	11.85	.479
TOTAL	100.65	4.068
MG/MG+FE=		63.4
CA: MG: FE =	45.84	28.93 25.24
CA: NA: K =	87.35	12.65 0

Sample=? CY103 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.66	.049
MgO	9.87	.565
Al2O3	.98	.045
SiO2	51.49	1.979
CaO	21.49	.885
MnO	1.32	.043
FeO	14.2	.457
TOTAL	98.01	4.023
MG/MG+FE=		55.28
CA: MG: FE =	46.41	29.63 23.96
CA: NA: K =	94.75	5.25 0

Sample=? CY103 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.59	.044
MgO	10.98	.625
Al2O3	.7	.031
SiO2	51.73	1.977
CaO	22.4	.917
MnO	1.27	.041
FeO	12.35	.395
TOTAL	100.82	4.03
MG/MG+FE=		61.27
CA: MG: FE =	47.34	32.27 20.39
CA: NA: K =	95.42	4.58 0

Sample=? CY105BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	15.45	1.656
Al2O3	13.96	1.183
SiO2	38.85	2.792
K2O	10.12	.928
CaO	.67	.052
TiO2	4.39	.237
FeO	16.57	.996
TOTAL	97.99	7.844
MG/MG+FE=		62.44
CA: MG: FE =	1.92	61.24 36.83
CA: NA: K =	5.31	0 94.69

Sample=? CY105PYROXENE NEAR ABOVE OXNO.=? -6

ELEM	OX	STRUCT
MgO	14.54	.803
Al2O3	1.53	.067
SiO2	53.33	1.976
CaO	22.43	.891
FeO	8.18	.254
TOTAL	102.77	3.991
MG/MG+FE=		75.97
CA: MG: FE =	45.74	41.22 13.04
CA: NA: K =	100	0 0

Sample=? CY105 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.91	.341
Al2O3	17.97	1.944
SiO2	65.42	6.004
K2O	13.38	1.567
CaO	.92	.091
FeO	.39	.03
TOTAL	98.75	9.977
MG/MG+FE=		0
CA: MG: FE =	75.21	0 24.79
CA: NA: K =	4.55	17.06 78.39

CY105, 106

Sample=? CY105 BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	14.97	1.609
Al2O3	13.79	1.172
SiO2	38.95	2.809
K2O	9.9	.911
CaO	.64	.05
TiO2	4.1	.223
FeO	17.61	1.062
TOTAL	94.45	7.836

MG/MG+FE= 60.24

CA: MG: FE = 1.84 59.13 39.03

CA: NA: K = 5.2 0 94.8

Sample=? CY105 BIOTITE AGAINST MAGNETITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	15.97	1.716
Al2O3	14.36	1.22
SiO2	39.08	2.817
K2O	10.09	.928
CaO	.67	.052
TiO2	2.3	.125
FeO	17.53	1.057
TOTAL	94.44	7.915

MG/MG+FE= 61.88

CA: MG: FE = 1.84 60.74 37.42

CA: NA: K = 5.31 0 94.69

Sample=? CY105AMPHIBOLE NEAR BIOTITE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	8.42	2.084
Al2O3	23.03	3.463
SiO2	62.79	8.008
K2O	.47	.076
CaO	4.8	.656
FeO	.49	.052
TOTAL	101.06	14.339

MG/MG+FE= 0

CA: MG: FE = 92.66 0 7.34

CA: NA: K = 23.3 74.01 2.7

Sample=? CY105 BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	15.32	1.645
Al2O3	14.28	1.212
SiO2	39.15	2.819
K2O	10.03	.922
CaO	.69	.053
TiO2	3.12	.169
FeO	17.41	1.048
TOTAL	97.82	7.868

MG/MG+FE= 61.08

CA: MG: FE = 1.93 59.91 38.16

CA: NA: K = 5.44 0 94.56

Sample=? CY106 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.83	.326
Al2O3	18.52	2.004
SiO2	65.07	5.976
K2O	13.93	1.631
CaO	.67	.066
TOTAL	100.16	10.003

CA: MG: FE = 100 0 0

CA: NA: K = 3.26 16.11 80.62

Sample=? CY106 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	15.97	.877
Al2O3	1.06	.046
SiO2	53.2	1.96
CaO	23.76	.938
TiO2	.4	.011
FeO	5.61	.173
TOTAL	101.65	4.005

MG/MG+FE= 83.52

CA: MG: FE = 47.18 44.11 8.7

CA: NA: K = 100 0 0

Sample=? CY106 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.39	.423
Al2O3	18.93	2.043
SiO2	64.99	5.948
K2O	12.97	1.515
CaO	.7	.069
TOTAL	99.56	9.998

CA: MG: FE = 100 0 0

CA: NA: K = 3.44 21.08 75.49

Sample=? CY106 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	17.08	.93
Al2O3	.76	.033
SiO2	54.12	1.978
CaO	23.21	.936
Cr2O3	.28	.006
FeO	3.87	.118
TOTAL	101.64	4.003

MG/MG+FE= 80.74

CA: MG: FE = 47.18 46.87 5.95

CA: NA: K = 100 0 0

Sample=? CY106 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.09	.156
MgO	9.82	.564
Al2O3	2.53	.115
SiO2	49.74	1.917
CaO	20.4	.842
TiO2	.48	.014
MnO	.57	.019
FeO	14.37	.463
TOTAL	103.21	4.09

MG/MG+FE= 54.92

CA: MG: FE = 45.05 30.18 24.77

CA: NA: K = 84.37 15.63 0

Sample=? CY106-MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	2.51	.52
SiO2	35.83	6.285
CaO	32.56	6.119
TiO2	2.27	.299
MnO	.75	.111
FeO	26.1	3.829
TOTAL	94.98	17.163

MG/MG+FE= 0

CA: MG: FE = 61.51 0 38.49

CA: NA: K = 100 0 0

Sample=? CY106 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.05	.364
Al2O3	18.56	2.004
SiO2	65.2	5.976
K2O	13.43	1.57
CaO	.77	.076
TOTAL	99.28	9.99

CA: MG: FE = 100 0 0

CA: NA: K = 3.78 18.11 78.11

Sample=? CY106 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.39	.424
Al2O3	18.73	2.021
SiO2	65.07	5.96
K2O	13.07	1.527
CaO	.76	.074
TOTAL	101.16	10.006

CA: MG: FE = 100 0 0

CA: NA: K = 3.65 20.94 75.41

Sample=? CY106 OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.31	.41
Al2O3	18.52	2.004
SiO2	64.95	5.963
K2O	13.49	1.58
CaO	.74	.073
TOTAL	102.11	10.03

CA: MG: FE = 100 0 0

CA: NA: K = 3.54 19.87 76.59

Sample=? CY106 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.05	.365
Al2O3	18.5	2.001
SiO2	65.1	5.974
K2O	13.64	1.596
CaO	.71	.07
TOTAL	100.47	10.006

CA: MG: FE = 100 0 0

CA: NA: K = 3.45 17.97 78.58

CY107,108,109,113A

Sample=? CY107 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	14.26	.79
Al2O3	.98	.043
SiO2	53.42	1.985
CaO	22.75	.906
Cr2O3	.28	.008
FeO	8.34	.259
TOTAL	100.01	3.991
MG/MG+FE=		75.31
CA: MG: FE =	46.34	40.41 13.25
CA: NA: K =	100	0 0

Sample=? CY107 BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	15.21	1.641
Al2O3	14.25	1.216
SiO2	38.98	2.822
K2O	10.09	.932
CaO	.71	.055
TiO2	2.35	.128
FeO	18.41	1.115
TOTAL	92.94	7.909
MG/MG+FE=		59.54
CA: MG: FE =	1.96	58.38 39.67
CA: NA: K =	5.57	0 94.43

Sample=? CY108 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	7.12	1.257
Al2O3	33.07	3.551
SiO2	49.71	4.529
CaO	10.09	.985
TOTAL	100.96	10.322
CA: MG: FE =	100	0 0
CA: NA: K =	43.93	56.07 0

Sample=? CY108 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.15	.92
Al2O3	34.62	3.758
SiO2	46.29	4.263
CaO	13.94	1.375
TOTAL	101.09	10.316
CA: MG: FE =	100	0 0
CA: NA: K =	59.91	40.09 0

Sample=? CY109 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.67	.049
MgO	12.55	.703
Al2O3	1.59	.07
SiO2	52.09	1.958
CaO	22.7	.914
TiO2	.35	.01
MnO	.53	.017
FeO	9.52	.299
TOTAL	100.92	4.02
MG/MG+FE=		70.16
CA: MG: FE =	47.7	36.69 15.61
CA: NA: K =	94.91	5.09 0

Sample=? CY109 SANIDINE GRAIN

ELEM	OX	STRUCT
Na2O	6.64	1.141
Al2O3	21.52	2.248
SiO2	65.3	5.786
K2O	3.77	.426
CaO	2.52	.239
TiO2	.25	.017
Total	102.83	9.8572
Ca: Mg: Fe =	100	0 0
Ca: Na: K =	13.23	63.18 23.59
AFM Ratio =	100	

Sample=? 113A REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.25	.401
Al2O3	18.71	2.025
SiO2	64.77	5.948
K2O	13.49	1.58
CaO	.76	.074
TOTAL	99.42	10.028
CA: MG: FE =	100	0 0
CA: NA: K =	3.6	19.51 76.89

Sample=? 113A ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.82	.5
Al2O3	18.5	1.995
SiO2	65.25	5.97
K2O	12.59	1.469
CaO	.85	.084
TOTAL	99.13	10.018
CA: MG: FE =	100	0 0
CA: NA: K =	4.09	24.35 71.55

Sample=? CY113A AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	3.83	1.15
MgO	7.49	1.731
Al2O3	11.87	2.167
SiO2	39.15	6.065
K2O	1.58	.312
CaO	10.37	1.721
TiO2	1	.117
MnO	.56	.073
FeO	24.17	3.132
TOTAL	97.41	16.468
MG/MG+FE=		35.6
CA: MG: FE =	26.14	26.29 47.57
CA: NA: K =	54.07	36.13 9.8

Sample=? CY113A ANOTHER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	3.26	.987
MgO	6.58	1.531
Al2O3	12.23	2.248
SiO2	38.48	6.003
K2O	1.89	.376
CaO	10.69	1.787
TiO2	1.13	.133
MnO	.67	.089
FeO	25.07	3.271
TOTAL	98.02	16.425
MG/MG+FE=		31.88
CA: MG: FE =	27.12	23.24 49.64
CA: NA: K =	56.73	31.33 11.94

Sample=? CY113A FELDSPAR ABOUT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.94	.169
Al2O3	18.39	2.006
SiO2	64.3	5.952
K2O	15.5	1.831
CaO	.84	.083
TOTAL	99.15	10.041
CA: MG: FE =	100	0 0
CA: NA: K =	3.98	8.11 87.9

Sample=? CY113AK-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.56	.28
Al2O3	18.4	2.001
SiO2	64.58	5.957
K2O	14.59	1.717
CaO	.85	.084
TOTAL	99.95	10.039
CA: MG: FE =	100	0 0
CA: NA: K =	4.04	13.46 82.51

Sample=? CY113A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.59	.46
Al2O3	18.22	1.968
SiO2	65.33	5.988
K2O	13.08	1.53
CaO	.8	.078
TOTAL	99.82	10.024
CA: MG: FE =	100	0 0
CA: NA: K =	3.77	22.24 73.98

Sample=? CY113A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.29	.583
Al2O3	18.46	1.988
SiO2	65.42	5.976
K2O	12.15	1.417
CaO	.67	.066
TOTAL	99.32	10.03
CA: MG: FE =	100	0 0
CA: NA: K =	3.19	28.22 68.59

CY113A, 114, 115

Sample=? CY113A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.61	.638
Al2O3	18.9	2.029
SiO2	65.31	5.951
K2O	11.47	1.333
CaO	.71	.07
TOTAL	99.53	10.021

CA: MG: FE = 100 0 0
CA: NA: K = 3.43 31.26 65.31

Sample=? CY113A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.83	.503
Al2O3	18.65	2.014
SiO2	64.99	5.954
K2O	12.77	1.492
CaO	.77	.076
TOTAL	98.83	10.039

CA: MG: FE = 100 0 0
CA: NA: K = 3.67 24.29 72.04

Sample=? CY113A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.48	.266
Al2O3	18.52	2.018
SiO2	64.24	5.938
K2O	14.89	1.756
CaO	.88	.087
TOTAL	98.18	10.065

CA: MG: FE = 100 0 0
CA: NA: K = 4.13 12.61 83.26

Sample=? CY113A K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.62	.465
Al2O3	18.84	2.036
SiO2	64.77	5.939
K2O	13.03	1.525
CaO	.74	.073
TOTAL	101.85	10.038

CA: MG: FE = 100 0 0
CA: NA: K = 3.54 22.54 73.92

Sample=? CY114 PYROXENE CORE OXNO.=? -6

ELEM	OX	STRUCT
MgO	12.32	.692
Al2O3	3.16	.14
SiO2	50.04	1.886
CaO	24.46	.988
TiO2	.78	.022
FeO	9.24	.291
TOTAL	104.06	4.019

MG/MG+FE= 70.4
CA: MG: FE = 50.13 35.11 14.76
CA: NA: K = 100 0 0

Sample=? CY114 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.2	.214
Al2O3	17.93	1.944
SiO2	65.35	6.009
K2O	14.06	1.649
CaO	1.02	.101
FeO	.44	.034
TOTAL	99.2	9.95099

CA: NA: K = 5.14 10.9 83.96

Sample=? CY1143 K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.13	.202
Al2O3	18.2	1.972
SiO2	65.22	5.997
K2O	14.44	1.694
CaO	1.01	.099
TOTAL	99.64	9.964

CA: NA: K = 4.96 10.13 84.91

Sample=? CY114 MELANITE OXNO.=? -24

ELEM	OX	STRUCT
Al2O3	2.15	.443
SiO2	35.13	6.131
CaO	32.94	6.16
TiO2	4.72	.62
Cr2O3	.28	.038
FeO	24.79	3.619
TOTAL	97.24	17.011

CA: MG: FE = 62.99 0 37.01

Sample=? CY115 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.12	.083
MgO	10.74	.61
Al2O3	2.15	.097
SiO2	50.7	1.931
CaO	22.44	.916
TiO2	.48	.014
Cr2O3	.25	.007
FeO	12.13	.387
TOTAL	103.44	4.045

MG/MG+FE= 61.18
CA: MG: FE = 47.88 31.89 20.23
CA: NA: K = 91.69 8.31 0

Sample=? CY115 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	3.18	.236
MgO	9.02	.515
Al2O3	1.19	.054
SiO2	52.5	2.01
CaO	19.32	.793
FeO	14.77	.473
TOTAL	101.93	4.081

MG/MG+FE= 52.13
CA: MG: FE = 44.53 28.92 26.56
CA: NA: K = 77.07 22.93 0

Sample=? CY115 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.98	.222
MgO	8.72	.5
Al2O3	1.17	.053
SiO2	52.13	2.004
CaO	19.39	.799
FeO	15.61	.502
TOTAL	101.15	4.08

MG/MG+FE= 49.9
CA: MG: FE = 44.36 27.76 27.87
CA: NA: K = 78.26 21.74 0

Sample=? CY115 PYX. ABOUT ABOVE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.44	.032
MgO	15.57	.855
Al2O3	.4	.017
SiO2	53.99	1.988
CaO	24.36	.961
Cr2O3	.37	.011
FeO	4.88	.15
TOTAL	100.73	4.014

CA: MG: FE = 48.88 43.49 7.63
CA: NA: K = 96.78 3.22 0

Sample=? CY115 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.12	.2
Al2O3	17.78	1.935
SiO2	64.97	5.997
K2O	14.41	1.697
CaO	1.06	.105
FeO	.68	.053
TOTAL	100.34	9.987

CA: NA: K = 5.24 9.99 84.77

Sample=? CY115 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.15	.205
Al2O3	18.35	1.992
SiO2	64.77	5.966
K2O	14.13	1.66
CaO	1.13	.112
FeO	.45	.035
TOTAL	99.34	9.97

CA: NA: K = 5.67 10.37 83.97

Sample=? CY1115 REPEAT ABOVE OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.5	.9
SiO2	54.91	2.009
CaO	23.67	.928
Cr2O3	.39	.011
FeO	4.53	.139
TOTAL	98.36	3.987

MG/MG+FE= 86.62
CA: MG: FE = 47.18 45.75 7.07
CA: NA: K = 100 0 0

CY120, 121

Sample=? CY 120

ELEM	OX	STRUCT
Na2O	8.88	1.513
Al2O3	21.74	2.253
SiO2	65.71	5.778
K2O	.55	.061
CaO	2.94	.277
Total	98.57	9.8828

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 14.96 81.74 3.3

AFM Ratio = 100

Sample=? CY 120 EDGE OF PLAGIOCLASE

ELEM	OX	STRUCT
Na2O	6.65	1.146
Al2O3	25.39	2.661
SiO2	60.43	5.374
K2O	.45	.051
CaO	6.95	.663
Total	99.64	9.8944

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 35.65 61.61 2.74

AFM Ratio = 100

Sample=? CY 120 EDGE OF ANOTHER PLAGIOCLASE

ELEM	OX	STRUCT
Na2O	6.35	1.096
Al2O3	25.23	2.647
SiO2	60.44	5.38
K2O	.62	.07
CaO	7.21	.688
Total	98.27	9.8802

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 37.11 59.12 3.78

AFM Ratio = 100

Sample=? CY 120 EDGE OF K FELDSPAR

ELEM	OX	STRUCT
Na2O	1.14	.204
Al2O3	18.36	2
SiO2	64.28	5.941
K2O	15.01	1.77
CaO	.93	.092
TiO2	.28	.02
Total	98.26	10.0264

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.45 9.87 85.67

AFM Ratio = 100

Sample=? CY120 EDGE PLAG.

ELEM	OX	STRUCT
Na2O	7.71	1.32
Al2O3	23.34	2.43
SiO2	63.56	5.612
K2O	.43	.049
CaO	4.72	.446
Total	97.71	9.8575

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 24.57 72.73 2.7

AFM Ratio = 100

Sample=?

ELEM	OX	STRUCT
Na2O	6.65	1.144
Al2O3	25	2.613
SiO2	61.19	5.424
K2O	.31	.035
CaO	6.77	.643
Total	100.19	9.8585

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 35.29 62.79 1.92

AFM Ratio = 100

Sample=? CY120 PLAG. FELDSPAR

ELEM	OX	STRUCT
Na2O	7.97	1.364
Al2O3	23.63	2.458
SiO2	63.28	5.584
K2O	.39	.043
CaO	4.68	.442
Total	97.89	9.8905

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 23.9 73.77 2.33

AFM Ratio = 100

Sample=? CY120 ANOTHER SPOYT K=FELDSPAR

ELEM	OX	STRUCT
Na2O	.96	.172
Al2O3	17.98	1.965
SiO2	64.27	5.96
K2O	15.5	1.834
CaO	1.3	.129
Total	100.79	10.0603

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 6.04 8.06 85.9

AFM Ratio = 100

Sample=? CY120 PLAG NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	5.76	1
Al2O3	26.75	2.825
SiO2	57.98	5.195
K2O	.6	.069
CaO	8.74	.839
Total	100.83	9.9272

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 43.97 52.41 3.62

AFM Ratio = 100

Sample=? CY120 ANOTHER SPOT PLAG. EDGE

ELEM	OX	STRUCT
Na2O	8.29	1.416
Al2O3	23	2.388
SiO2	64.09	5.646
K2O	.45	.051
CaO	4.16	.393
Total	100.09	9.8938

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 21.13 76.13 2.74

AFM Ratio = 100

Sample=? CY120 K-FELDSPAR WITH ABOVE

ELEM	OX	STRUCT
Na2O	2.1	.375
Al2O3	19.15	2.074
SiO2	63.38	5.821
K2O	12.89	1.51
CaO	.92	.091
TiO2	1.55	.107
Total	100.02	9.9773

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.61 18.98 76.42

AFM Ratio = 100

Sample=? CY121 PYROXENE - GREEEN\?

OXNO.=? 6

ELEM	OX	STRUCT
Na2O	.56	.041
MgO	13.18	.741
Al2O3	1.81	.08
SiO2	51.57	1.944
CaO	22.9	.925
MnO	.32	.01
FeO	9.35	.295
Total	101.05	4.036
Mg/Mg+Fe=		71.53

Ca: Mg: Fe = 47.17 37.79 15.04

Ca: Na: K = 95.76 4.24 0

AFM Ratio = 3.72

Sample=? CY121 BIOTITE\?

OXNO.=? 11

ELEM	OX	STRUCT
Na2O	.28	.039
MgO	15.25	1.653
Al2O3	13.78	1.182
SiO2	38.17	2.777
K2O	10.23	.949
CaO	.54	.042
TiO2	3.31	.181
MnO	.26	.016
FeO	18.18	1.106
Total	98.96	7.9454
Mg/Mg+Fe=		59.91

Ca: Mg: Fe = 1.5 59.01 39.49

Ca: Na: K = 4.08 3.79 92.14

AFM Ratio = 17.64

CY121, 122

Sample=? CY121 ANOTHER GREEN PYROXENE

ELEM	OX	STRUCT
Na2O	.54	.039
MgO	13.41	.75
Al2O3	1.55	.069
SiO2	52.21	1.96
CaO	22.76	.915
MnO	.35	.011
FeO	8.96	.281
Total	102.58	4.0254

OXNO.=? -6

Mg/Mg+Fe= 72.74

Ca: Mg: Fe = 47.02 38.54 14.44

Ca: Na: K = 95.91 4.09 0

AFM Ratio = 3.24

Sample=? CY121 INTER GRANULAR FELDSPAR

ELEM	OX	STRUCT
Na2O	3.43	.604
Al2O3	18.82	2.017
SiO2	65.54	5.96
K2O	11.1	1.288
CaO	1.11	.108
Total	101.22	9.9776

OXNO.=? -16

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.4 30.2 64.4

AFM Ratio = 100

Sample=? CY121 ANOTHER K-SPAR

ELEM	OX	STRUCT
Na2O	3.11	.55
Al2O3	18.87	2.027
SiO2	65.29	5.952
K2O	11.63	1.352
CaO	1.06	.103
Total	101.44	9.9851

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.14 27.43 67.43

AFM Ratio = 100

Sample=? CY121 INTER GRANULAR PLAG.

ELEM	OX	STRUCT
Na2O	7.54	1.291
Al2O3	23.84	2.483
SiO2	62.88	5.557
K2O	.39	.044
CaO	5.22	.494
Total	100.19	9.8694

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 27.01 70.59 2.41

AFM Ratio = 100

Sample=? CY121 ANOTHER PLAG.

ELEM	OX	STRUCT
Na2O	7.4	1.272
Al2O3	24.28	2.536
SiO2	61.92	5.489
K2O	.45	.051
CaO	5.86	.556
Total	100.8	9.904

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 29.59 67.7 2.71

AFM Ratio = 100

Sample=? CY121ANOTHER K-SPAR\?

ELEM	OX	STRUCT
Na2O	3.3	.584
Al2O3	18.81	2.022
SiO2	65.24	5.949
K2O	11.57	1.346
CaO	1.07	.105
Total	102.77	10.0053

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.16 28.7 66.14

AFM Ratio = 100

Sample=? CY122 ALTERED FELDSPATHOID?

ELEM	OX	STRUCT
Na2O	13.13	.994
Al2O3	26.09	1.2
SiO2	60.12	2.345
K2O	.51	.025
Total	91.07	4.5641

OXNO.=? -7

Ca: Na: K = 0 97.55 2.45

AFM Ratio = 100

Sample=? CY122 CORE OF SANIDINE PHENOCRYST

ELEM	OX	STRUCT
Na2O	2.31	.411
Al2O3	18.95	2.048
SiO2	64.49	5.913
K2O	12.94	1.514
CaO	1.04	.102
TiO2	.27	.019
Total	102.24	10.006

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.03 20.28 74.69

AFM Ratio = 100

Sample=? CY122 CORE OF MELANITE LIGHT

ELEM	OX	STRUCT
Na2O	.49	.161
MgO	.57	.142
Al2O3	8.13	1.615
SiO2	35.3	5.946
CaO	31.17	5.626
TiO2	3.85	.487
MnO	1.09	.155
FeO	19.22	2.708
Total	105.25	16.84

OXNO.=? -24

Mg/Mg+Fe= 4.98

Ca: Mg: Fe = 66.38 1.68 31.95

Ca: Na: K = 97.22 2.78 0

AFM Ratio = 22.08

Sample=? CY122 DARKER BAND IN ABOVE MELANITE

ELEM	OX	STRUCT
Na2O	.29	.095
MgO	.58	.145
Al2O3	7.47	1.49
SiO2	34.82	5.889
CaO	31.37	5.685
TiO2	4.64	.59
MnO	.96	.138
FeO	19.74	2.792
Total	100	16.8237

Mg/Mg+Fe= 4.94

Ca: Mg: Fe = 65.94 1.68 32.38

Ca: Na: K = 98.36 1.64 0

AFM Ratio = 20.23

Sample=? CY122 OUTER LIGHT PART OF ABOVE

ELEM	OX	STRUCT
Na2O	.3	.097
MgO	.51	.128
Al2O3	8.22	1.635
SiO2	35.94	6.065
CaO	31.37	5.671
TiO2	2.29	.29
MnO	1.17	.167
FeO	20	2.823
Total	100.38	16.8762

Mg/Mg+Fe= 4.34

Ca: Mg: Fe = 65.77 1.48 32.74

Ca: Na: K = 98.32 1.68 0

AFM Ratio = 21.69

Sample=? CY122 ANALCITE MASS

ELEM	OX	STRUCT
Na2O	13.59	1.035
Al2O3	26.78	1.239
SiO2	58.51	2.297
K2O	.84	.042
CaO	.24	.01
Total	86.73	4.6221

OXNO.=? -7

Ca: Mg: Fe = 100 0 0

Ca: Na: K = .92 95.22 3.86

AFM Ratio = 100

Sample=? CY122 ANOTHER ANALCITE

ELEM	OX	STRUCT
Na2O	13.71	1.045
Al2O3	27.08	1.254
SiO2	58.21	2.288
K2O	.84	.042
Total	84.77	4.6288

Ca: Na: K = 0 96.14 3.86

AFM Ratio = 100

CY123, JR, X44

Sample=? CY123 ALTERED FELDSPATHOID HAUYNITE?

OXNO.=? -10

ELEM	OX	STRUCT
Na2O	8.68	.972
Al2O3	35.32	2.403
SiO2	45.6	2.633
CaO	10.4	.643
Total	79.26	6.6514

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 39.81 60.19 0

AFM Ratio = 100

Sample=? CY123 SANIDINE

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.55	.453
Al2O3	18.99	2.049
SiO2	64.81	5.933
K2O	12.7	1.483
CaO	.96	.094
Total	99.86	10.0111

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.63 22.32 73.05

AFM Ratio = 100

Sample=? JR SPESSARTITE GARNET

OXNO.=? -24

ELEM	OX	STRUCT
Na2O	.34	.104
Al2O3	21.45	3.99
SiO2	38.33	6.047
CaO	16	2.706
MnO	20.54	2.746
FeO	3.18	.419
Total	101.4	16.0105

Mg/Mg+Fe= 0

Ca: Mg: Fe = 86.59 0 13.41

Ca: Na: K = 96.3 3.7 0

AFM Ratio = 82.64

Sample=? JR K-FELDSPAR PHENOCRYST

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.96	.171
Al2O3	19.5	2.116
SiO2	62.86	5.79
K2O	14.02	1.647
CaO	.8	.079
TiO2	1.86	.129
Total	97.87	9.9323

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.16 9.01 86.82

AFM Ratio = 100

Sample=? JR GROUNDMASS LATH

ELEM	OX	STRUCT
Na2O	.77	.14
Al2O3	17.99	1.973
SiO2	63.91	5.949
K2O	15.91	1.89
CaO	1.27	.126
Total	101.31	10.0788

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.84 6.49 87.66

AFM Ratio = 100

Sample=? JR PLATY GROUNDMASS MINERAL MICA

ELEM	OX	STRUCT
Na2O	1.51	.195
MgO	.55	.055
Al2O3	20.38	1.595
SiO2	54.86	3.642
K2O	9.76	.827
CaO	1.53	.109
TiO2	.56	.028
FeO	10.68	.593
Total	96.76	7.0431

Mg/Mg+Fe= 8.49

Ca: Mg: Fe = 14.4 7.27 78.34

Ca: Na: K = 9.64 17.24 73.12

AFM Ratio = 55.17

SAMPLE = ? X44\? 0 OXNO.=? -16

ELEM	OX%	STRUCT
NA2O	18.13	3.2014
AL2O3	18.73	2.004
SIO2	62.46	5.6715
MGO	.23	.0205
CAO	.06	.0054
CR2O3	.16	.0115
FEO	.18	.0137

Sample=? X44 REPEAT

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.57	.102
Al2O3	17.88	1.951
SiO2	64.71	5.994
K2O	15.88	1.876
CaO	.95	.094
TOTAL	100.45	10.017

MG/MG+FE= 88.04

CA: MG: FE = 8.63 80.44 10.93

CA: NA: K = 4.54 4.92 90.54

Sample=? X44 PECTOLITE\?

OXNO.=? -6

ELEM	OX	STRUCT
Na2O	8.57	.623
Al2O3	.59	.026
SiO2	58.34	2.186
CaO	29.4	1.18
FeO	3.11	.098
TOTAL	79.2	4.113

MG/MG+FE= 89.94

CA: MG: FE = 54.78 40.67 4.55

CA: NA: K = 32.07 16.93 50.99

Sample=? X44 ANOTHER PECTOLITE\

OXNO.=? -6

ELEM	OX	STRUCT
Na2O	8.22	.598
Al2O3	1.17	.052
SiO2	57.95	2.172
CaO	29.12	1.169
FeO	3.54	.111
TOTAL	84.92	4.102

MG/MG+FE= 88.75

CA: MG: FE = 54.22 40.63 5.15

CA: NA: K = 32.09 16.42 51.5

Sample=? X44 ADJACENT FELDSPAR

OXNO.=? -16

ELEM	OX	STRUCT
Al2O3	17.78	1.953
SiO2	64.18	5.979
K2O	17.06	2.027
CaO	.98	.098
TOTAL	101.18	10.057

MG/MG+FE= 88.75

CA: MG: FE = 9.03 80.74 10.23

CA: NA: K = 2.09 54.75 43.16

Sample=? X44 SMALL OTHER PHENOCRYST

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.53	.095
Al2O3	17.65	1.93
SiO2	64.67	6.001
K2O	16.19	1.917
CaO	.97	.096
TOTAL	101.93	10.039

MG/MG+FE= 88.75

CA: MG: FE = 8.86 80.89 10.25

CA: NA: K = 4.55 4.51 90.94

Sample=? X44 AEGIRINE CRYSTALS IN GROUND MASS

ELEM	OX	STRUCT
Na2O	12.16	.924
MgO	1.91	.111
Al2O3	1.66	.077
SiO2	54.14	2.123
CaO	2.04	.086
TiO2	2.25	.066
FeO	25.83	.847
TOTAL	98.83	4.234

MG/MG+FE= 11.59

CA: MG: FE = 8.24 10.63 81.13

CA: NA: K = 2.94 31.57 65.49

Sample=? X44 SMALL TWINNED PECTOLITE CRYSTALS

OXNO.=? -6

ELEM	OX	STRUCT
Na2O	8.57	.621
SiO2	58.46	2.185
CaO	32.97	1.32
TOTAL	98.34	4.126

MG/MG+FE= 11.59

CA: MG: FE = 57.95 4.87 37.18

CA: NA: K = 34.21 16.1 49.69

Sample=? X44 CORE OF SANIDINE

ELEM	OX	STRUCT
Na2O	.81	.145
Al2O3	17.85	1.946
SiO2	64.53	5.974
K2O	15.33	1.809
CaO	1.11	.11
TiO2	.32	.022
Total	100.95	10.0076

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.35 7.03 87.63

AFM Ratio = 100

Sample=? X44 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	1.04	.185
Al2O3	18.27	1.981
SiO2	64.86	5.967
K2O	14.46	1.697
CaO	.9	.089
TiO2	.48	.033
Total	101.74	9.9507

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.52 9.39 86.1

AFM Ratio = 100

Sample=? X44 ANOTHER CORE\?

ELEM	OX	STRUCT
Na2O	1.42	.253
Al2O3	18.92	2.046
SiO2	63.75	5.849
K2O	13.32	1.559
CaO	.79	.078
TiO2	1.81	.125
Total	100.43	9.909

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.13 13.39 82.49

AFM Ratio = 100

Sample=? X44 EDGE OF ABOVE\?

ELEM	OX	STRUCT
Na2O	1.05	.186
Al2O3	18.45	1.999
SiO2	64.73	5.95
K2O	14.29	1.675
CaO	.85	.084
TiO2	.64	.044
Total	101.82	9.9376

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.32 9.56 86.12

AFM Ratio = 100

Sample=? X44 ANOTHER CORE\?

ELEM	OX	STRUCT
Na2O	.32	.057
Al2O3	18.21	1.982
SiO2	64.53	5.96
K2O	15.51	1.827
CaO	.83	.084
TiO2	.59	.041
Total	102.12	9.9506

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.27 2.9 92.84

AFM Ratio = 100

Sample=? X44 EDGE OF ABOVE\?

ELEM	OX	STRUCT
Na2O	.83	.157
Al2O3	18.27	1.979
SiO2	65.04	5.979
K2O	14.57	1.709
CaO	.79	.078
TiO2	.45	.031
Total	101.59	9.9337

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.01 8.08 87.91

AFM Ratio = 100

Sample=? X44 ANOTHER CORE\?

ELEM	OX	STRUCT
Na2O	.36	.065
Al2O3	18.09	1.975
SiO2	64.11	5.938
K2O	15.69	1.854
CaO	1.04	.103
TiO2	.72	.05
Total	101.52	9.9844

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.09 3.21 91.69

AFM Ratio = 100

Sample=? X44 EDGE OF ABOVE\?

ELEM	OX	STRUCT
Na2O	1.26	.224
Al2O3	18.95	2.053
SiO2	63.37	5.826
K2O	13.61	1.596
CaO	.83	.082
TiO2	1.99	.137
Total	100.3	9.9197

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.31 11.78 83.91

AFM Ratio = 100

Sample=? X44 ANOTHER CORE\?

ELEM	OX	STRUCT
Na2O	2.34	.415
Al2O3	18.11	1.95
SiO2	65.87	6.017
K2O	12.74	1.485
CaO	.93	.091
Total	102	9.9577

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.57 20.84 74.59

AFM Ratio = 100

Sample=? X44 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	.97	.174
Al2O3	17.71	1.925
SiO2	65.24	6.019
K2O	15.03	1.769
CaO	1.05	.103
Total	101.56	9.9903

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.03 8.5 86.46

AFM Ratio = 100

Sample=? X44 ANOTHER CORE

ELEM	OX	STRUCT
Na2O	1.03	.183
Al2O3	18.17	1.97
SiO2	64.92	5.972
K2O	14.49	1.7
CaO	.86	.085
TiO2	.54	.037
Total	101.57	9.9474

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.32 9.3 86.38

AFM Ratio = 100

Sample=? X44 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	1.02	.181
Al2O3	18.31	1.981
SiO2	65.05	5.972
K2O	14.21	1.664
CaO	.81	.08
TiO2	.6	.041
Total	101.79	9.9195

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.16 9.4 86.44

AFM Ratio = 100

Sample=? X44 ANOTHER CORE

ELEM	OX	STRUCT
Na2O	2.38	.421
Al2O3	18.36	1.975
SiO2	65.57	5.983
K2O	12.54	1.459
CaO	.71	.069
TiO2	.45	.031
Total	102.56	9.9386

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.54 21.6 74.806

AFM Ratio = 100

Sample=? X44 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	1.55	.156
Al2O3	18.38	1.991
SiO2	64.84	5.957
K2O	14.3	1.676
CaO	.86	.085
TiO2	.58	.04
Total	101.55	9.9372

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.37 9.55 86.08

AFM Ratio = 100

X50

Sample=? 1? X50 ABOVE AGAIN DEFOCUSSED BEAM

ELEM	OX	STRUCT
Na2O	2.28	.406
Al2O3	18.99	2.056
SiO2	64.2	5.896
K2O	12.85	1.506
CaO	1.36	.134
TiO2	.2	.014
FeO	.13	.01
TOTAL	102.07	10.022

OXNO.=? -16

MG/MG+FE= 0
MG/MG+FE= 0
CA: MG: FE = 93.06 0 6.94
CA: NA: K = 6.55 19.84 73.61

Sample=? X50 MUSCOVITE

ELEM	OX	STRUCT
Na2O	.44	.112
MgO	.32	.061
Al2O3	35.98	5.517
SiO2	46.29	6.023
K2O	12.08	2.006
CaO	.81	.113
FeO	4.07	.442
TOTAL	93.41	14.274

OXNO.=? -22

MG/MG+FE= 12.13
CA: MG: FE = 18.34 9.9 71.75
CA: NA: K = 5.06 5.02 89.91

Sample=? X50 ANOTHER MUSCOVITE

ELEM	OX	STRUCT
Na2O	.35	.088
MgO	.17	.032
Al2O3	35.13	5.39
SiO2	47.02	6.121
K2O	12.19	2.025
CaO	.76	.105
FeO	4.39	.478
TOTAL	95.2	14.239

OXNO.=? -22

MG/MG+FE= 6.27
CA: MG: FE = 17.07 5.2 77.72
CA: NA: K = 4.73 3.97 91.3

Sample=? X50ANOTHER MUSCOVITE

ELEM	OX	STRUCT
Na2O	.42	.106
MgO	.36	.071
Al2O3	35.84	5.514
SiO2	45.74	5.969
K2O	12.07	2.01
CaO	.8	.112
TiO2	.32	.031
FeO	4.44	.484
TOTAL	95.21	14.297

OXNO.=? -22

MG/MG+FE= 12.79
CA: MG: FE = 16.79 10.64 72.56
CA: NA: K = 5.03 4.76 90.22

Sample=? X50 ANOTHER MUSCOVITE

ELEM	OX	STRUCT
Na2O	.5	.125
Al2O3	37.77	5.757
SiO2	45.82	5.925
K2O	11.9	1.963
CaO	.73	.101
TiO2	.15	.015
FeO	3.11	.337
TOTAL	94.6	14.223

OXNO.=? -22

MG/MG+FE= 0
CA: MG: FE = 23.06 0 76.94
CA: NA: K = 4.61 5.71 89.68

Sample=? X50 ANOTHER MUSCOVITE

ELEM	OX	STRUCT
Na2O	.42	.105
MgO	.25	.048
Al2O3	35.01	5.37
SiO2	47	6.115
K2O	11.97	1.988
CaO	.8	.111
TiO2	.17	.016
FeO	4.37	.476
TOTAL	94.75	14.229

OXNO.=? -22

MG/MG+FE= 9.16
CA: MG: FE = 17.48 7.56 74.96
CA: NA: K = 5.04 4.76 90.2

Sample=? X50 ANOTHER MUSCOVITE

ELEM	OX	STRUCT
Na2O	.23	.058
MgO	.58	.113
Al2O3	35.47	5.438
SiO2	46.66	6.069
K2O	12.26	2.035
CaO	.81	.113
FeO	4	.435
TOTAL	95.01	14.261

OXNO.=? -22

MG/MG+FE= 20.62
CA: MG: FE = 17.1 17.1 65.81
CA: NA: K = 5.12 2.63 92.25

Sample=? X50 ANOTHER MUSCOVITE

ELEM	OX	STRUCT
Na2O	.51	.13
Al2O3	36.22	5.585
SiO2	45.48	5.949
K2O	11.96	1.996
CaO	.81	.114
FeO	5	.547
TOTAL	95.05	14.321

OXNO.=? -22

MG/MG+FE= 0
CA: MG: FE = 17.25 0 82.75
CA: NA: K = 5.09 5.8 89.11

Sample=? X50 MICA

ELEM	OX	STRUCT
Al2O3	37.63	2.859
SiO2	46.57	3.002
K2O	12.04	.99
CaO	.75	.052
FeO	3	.162
Total	87.89	7.064

OXNO.=? -11

Mg/Mg+Fe= 0
Ca: Mg: Fe = 24.3 0 75.7
Ca: Na: K = 4.99 0 95.01
AFM Ratio = 89.82

Sample=? X50 MICA

ELEM	OX	STRUCT
Al2O3	37.72	2.868
SiO2	46.47	2.998
K2O	12.1	.996
CaO	.63	.044
FeO	2.96	.16
Total	90.29	7.066

OXNO.=? -11

Mg/Mg+Fe= 0
Ca: Mg: Fe = 21.57 0 78.43
Ca: Na: K = 4.23 0 95.77
AFM Ratio = 89.96

Sample=? X50MICA AGAIN

ELEM	OX	STRUCT
Al2O3	35.81	2.749
SiO2	46.35	3.019
K2O	11.74	.976
CaO	.65	.045
TiO2	.3	.015
FeO	5.08	.276
Total	88.33	7.08

OXNO.=? -11

Mg/Mg+Fe= 0
Ca: Mg: Fe = 14.02 0 85.98
Ca: Na: K = 4.41 0 95.59
AFM Ratio = 83.28

Sample=? X50 SANIDINE ANOTHER PART

ELEM	OX	STRUCT
Na2O	2.32	.412
Al2O3	19.27	2.083
SiO2	64.26	5.893
K2O	12.73	1.49
CaO	1.44	.142
TOTAL	97.7	10.02

OXNO.=? -16

CA: NA: K = 6.95 20.16 72.9

Sample=? REPEAT

ELEM	OX	STRUCT
Na2O	3.64	.637
MgO	.22	.029
Al2O3	19.07	2.031
SiO2	66.12	5.974
K2O	10.33	1.19
CaO	.63	.061
Total	100.34	9.9238

Mg/Mg+Fe= 100
Ca: Mg: Fe = 67.78 32.22 0
Ca: Na: K = 3.23 33.74 63.03
AFM Ratio = 97.22
Trace Elements? 9

X50, X54

Sample=? 1? X50 ABOVE AGAIN DEFOCUSSED BEAM

ELEM	OX	STRUCT
Na2O	2.28	.406
Al2O3	18.99	2.056
SiO2	64.2	5.896
K2O	12.85	1.506
CaO	1.36	.134
TiO2	.2	.014
FeO	.13	.01
TOTAL	102.07	10.022
MG/MG+FE=		0
MG/MG+FE=		0

OXNO.=? -16

CA: MG: FE = 93.06 0 6.94
CA: NA: K = 6.55 19.84 73.61

Sample=? X50 MUSCOVITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	.44	.112
MgO	.32	.061
Al2O3	35.98	5.517
SiO2	46.29	6.023
K2O	12.08	2.006
CaO	.81	.113
FeO	4.07	.442
TOTAL	93.41	14.274
MG/MG+FE=		12.13

CA: MG: FE = 18.34 9.9 71.75
CA: NA: K = 5.06 5.02 89.91

Sample=? X50 ANOTHER MUSCOVITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	.35	.088
MgO	.17	.032
Al2O3	35.13	5.39
SiO2	47.02	6.121
K2O	12.19	2.025
CaO	.76	.105
FeO	4.39	.478
TOTAL	95.2	14.239
MG/MG+FE=		6.27

CA: MG: FE = 17.07 5.2 77.72
CA: NA: K = 4.73 3.97 91.3

Sample=? X50ANOTHER MUSCOVITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	.42	.106
MgO	.36	.071
Al2O3	35.84	5.514
SiO2	45.74	5.969
K2O	12.07	2.01
CaO	.8	.112
TiO2	.32	.031
FeO	4.44	.484
TOTAL	95.21	14.297
MG/MG+FE=		12.79

CA: MG: FE = 16.79 10.64 72.56
CA: NA: K = 5.03 4.76 90.22

Sample=? X50 ANOTHER MUSCOVITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	.5	.125
Al2O3	37.77	5.757
SiO2	45.82	5.925
K2O	11.9	1.963
CaO	.73	.101
TiO2	.15	.015
FeO	3.11	.337
TOTAL	94.6	14.223
MG/MG+FE=		0

CA: MG: FE = 23.06 0 76.94
CA: NA: K = 4.61 5.71 89.68

Sample=? X50 ANOTHER MUSCOVITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	.42	.105
MgO	.25	.048
Al2O3	35.01	5.37
SiO2	47	6.115
K2O	11.97	1.988
CaO	.8	.111
TiO2	.17	.016
FeO	4.37	.476
TOTAL	94.75	14.229
MG/MG+FE=		9.16

CA: MG: FE = 17.48 7.56 74.96
CA: NA: K = 5.04 4.76 90.2

Sample=? X50 ANOTHER MUSCOVITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	.23	.058
MgO	.58	.113
Al2O3	35.47	5.438
SiO2	46.66	6.069
K2O	12.26	2.035
CaO	.81	.113
FeO	4	.435
TOTAL	95.01	14.261
MG/MG+FE=		20.62

CA: MG: FE = 17.1 17.1 65.81
CA: NA: K = 5.12 2.63 92.25

Sample=? X50 ANOTHER MUSCOVITE OXNO.=? -22

ELEM	OX	STRUCT
Na2O	.51	.13
Al2O3	36.22	5.585
SiO2	45.48	5.949
K2O	11.96	1.996
CaO	.81	.114
FeO	5	.547
TOTAL	95.05	14.321
MG/MG+FE=		0

CA: MG: FE = 17.25 0 82.75
CA: NA: K = 5.09 5.8 89.11

Sample=? X50 MICA OXNO.=? -11

ELEM	OX	STRUCT
~~Al2O3~~	~~37.63~~	~~2.859~~
SiO2	46.57	3.002
~~K2O~~	~~12.04~~	~~.99~~
CaO	.75	.052
FeO	3	.162
Total	87.89	7.064
Mg/Mg+Fe=		0

Ca: Mg: Fe = 24.3 0 75.7
Ca: Na: K = 4.99 0 95.01
AFM Ratio = 89.82

Sample=? X50 MICA OXNO.=? -11

ELEM	OX	STRUCT
~~Al2O3~~	~~37.72~~	~~2.868~~
SiO2	46.47	2.998
~~K2O~~	~~12.1~~	~~.996~~
CaO	.63	.044
~~FeO~~	~~2.96~~	~~.16~~
Total	90.29	7.066
~~Mg/Mg+Fe=~~		~~0~~

Ca: Mg: Fe = 21.57 0 78.43
~~Ca: Na: K = 4.23 0 95.77~~
AFM Ratio = 89.96

Sample=? X50MICA AGAIN OXNO.=? -11

ELEM	OX	STRUCT
~~Al2O3~~	~~35.81~~	~~2.749~~
SiO2	46.35	3.019
~~K2O~~	~~11.74~~	~~.976~~
CaO	.65	.045
~~TiO2~~	~~.3~~	~~.015~~
FeO	5.08	.276
~~Total~~	~~88.33~~	~~7.08~~
Mg/Mg+Fe=		0

~~Ca: Mg: Fe = 14.02 0 85.98~~
Ca: Na: K = 4.41 0 95.59
~~AFM Ratio = 83.28~~

Sample=? X54 ANOTHER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.41	.698
MgO	9.48	2.109
Al2O3	13.81	2.428
SiO2	41.41	6.177
K2O	1.17	.222
CaO	11.5	1.838
TiO2	.78	.088
MnO	.32	.041
FeO	19.09	2.381
TOTAL	97.15	15.982
MG/MG+Fe=		46.97

CA: MG: FE = 29.05 33.33 37.63
CA: NA: K = 66.64 25.31 8.05

X54, X55

Sample=? X54 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.95	.563
MgO	9.35	2.094
Al2O3	14.11	2.473
SiO2	41.64	6.219
K2O	1.6	.304
CaO	11.56	1.851
TiO2	.62	.069
FeO	16.26	2.343
TOTAL	97.31	15.906
MG/MG+FE=		47.19
CA: MG: FE =	29.32	35.38 37.30
CA: NA: K =	67.98	20.77 11.23

Sample ? X54 FELDSPAR INC. IN AMPHIBOLITE

ELEM	OX	STRUCT
Na2O	11.39	1.936
Al2O3	20.03	2.069
SiO2	e7.5e	5.921
FeO	.3	.034
CaO	.73	.068
TOTAL	101.09	10.025
CA: MG: FE =	100	0 0
CA: NA: K =	3.34	95 1.67

Sample=? X54 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.73	.514
MgO	9.4	2.086
Al2O3	13.81	2.377
SiO2	42.06	6.26
K2O	1.45	.275
CaO	11.6	1.85
TiO2	.72	.08
FeO	19.43	2.421
TOTAL	99.92	15.863
MG/MG+FE=		46.28
CA: MG: FE =	29.1	32.81 38.08
CA: NA: K =	70.1	19.48 10.42

Sample=? X54 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.14	.612
MgO	9.67	2.477
Al2O3	13.87	2.406
SiO2	43.1	6.343
K2O	.66	.086
CaO	11.49	1.811
TiO2	.72	.079
FeO	18.23	2.305
TOTAL	97.87	15.719
MG/MG+FE=		47.4
CA: MG: FE =	29.24	33.34 37.22
CA: NA: K =	72.18	26.09 3.43

Sample=? X54 ANOTHER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.43	.704
MgO	9.39	2.092
Al2O3	14.15	2.495
SiO2	40.86	6.111
K2O	1.55	.296
CaO	11.52	1.845
TiO2	.62	.072
FeO	19.28	2.412
TOTAL	97.66	16.047
MG/MG+FE=		46.45
CA: MG: FE =	29.06	32.95 37.99
CA: NA: K =	64.55	24.75 10.4

Sample=? X54 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.64	.761
MgO	9.58	2.123
Al2O3	14.36	2.515
SiO2	41.24	6.104
K2O	1.15	.219
CaO	11.62	1.843
TiO2	.77	.086
MnO	.39	.049
FeO	18.35	2.279
TOTAL	98.41	15.99
MG/MG+FE=		48.23
CA: MG: FE =	29.05	34.22 36.73
CA: NA: K =	64.77	27.35 7.87

Sample=? X54 ANOTHER AMPHIBOLE

ELEM	OX	STRUCT
Na2O	2.41	.648
MgO	9.48	2.107
Al2O3	13.81	2.4 8
SiO2	41.41	6.1.7
K2O	1.17	.2
CaO	1.7	1.85
TiO2	.73	.083
MnO	.32	.6
FeO	19.09	2.3
TOTAL	97.15	15.
MG/MG+FE=		4
CA: MG: FE =	29.1	33. 37.6
CA: NA: K =	66.2	5

Sample=? X55 AMPHIBOLE

ELEM	OX	STRUCT
Na2O	2.09	.6
MgO	10.61	2.384
Al2O3	12.94	2.26
SiO2	42.21	6.252
K2O	1.49	.282
CaO	11.66	1.85
TiO2	1.17	.13
MnO	.28	.036
FeO	17.53	2.172
TOTAL	98.04	15.924
MG/MG+FE=		51.9
CA: MG: FE =	29.06	36.82 34.12
CA: NA: K =	67.72	21.96 10.32

Sample=? X55 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.95	.566
MgO	9.98	2.222
Al2O3	12.07	2.125
SiO2	42.4	6.331
K2O	1.49	.285
CaO	11.56	1.849
TiO2	.88	.099
FeO	19.64	2.453
TOTAL	97.32	15.93
MG/MG+FE=		47.53
CA: MG: FE =	28.34	34.06 37.6
CA: NA: K =	68.48	20.96 10.56

Sample=? X55AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.91	.551
MgO	10.5	2.323
Al2O3	12.28	2.149
SiO2	42.72	6.343
K2O	1.48	.281
CaO	11.53	1.834
TiO2	.87	.097
FeO	18.71	2.323
TOTAL	96.23	15.901
MG/MG+FE=		50
CA: MG: FE =	28.3	35.85 35.85
CA: NA: K =	68.79	20.67 10.54

Sample=? X55 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.98	.571
MgO	10.35	2.293
Al2O3	10.74	2.232
SiO2	42.18	6.272
K2O	1.63	.308
CaO	11.5	1.832
TiO2	1.03	.116
MnO	.39	.049
FeO	18.2	2.263
TOTAL	95.31	15.936
MG/MG+FE=		50.33
CA: MG: FE =	28.68	35.9 35.43
CA: NA: K =	67.58	21.06 11.36

X60, X55

Sample=? X55 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.43	.691
MgO	13.9	2.823
Al2O3	11.64	2.36
SiO2	41.12	6.035
K2O	1.58	.296
CaO	11.56	1.818
TiO2	2.02	.223
FeO	14.78	1.815
TOTAL	96.3	16.061

MG/MG+FE= 60.87

CA: MG: FE = 28.16 43.73 28.11

CA: NA: K = 64.81 24.63 10.55

Sample=? X55 K-FELDSPAR IN ROCK MATRIX OXNO.=? -16

ELEM	OX	STRUCT
Na2O	.46	.082
Al2O3	18.2	1.985
SiO2	64.65	5.982
K2O	15.92	1.88
CaO	.77	.076
TOTAL	102.72	10.005

CA: MG: FE = 100 0 0

CA: NA: K = 3.73 4.02 92.25

Sample=? X55K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.35	.419
Al2O3	18.35	1.992
SiO2	64.69	5.957
K2O	13.84	1.626
CaO	.8	.079
TOTAL	99.05	10.073

CA: MG: FE = 100 0 0

CA: NA: K = 3.73 19.73 76.55

Sample=? X60 FELDSPAR\? OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.98	1.033
Al2O3	25.86	2.717
SiO2	59.65	5.317
K2O	.7	.08
CaO	7.37	.704
FeO	.39	.029
Total	98.03	9.8806

Ms/Ms+Fe= 0

Ca: Mg: Fe = 96.04 0 3.96

Ca: Na: K = 38.75 56.85 4.4

AFM Ratio = 97.91

Sample=? X60 ANOTHER FELDSPAR\ OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.89	1.02
Al2O3	26.63	2.803
SiO2	58.6	5.233
K2O	.55	.063
CaO	8.23	.788
Total	101.86	9.9069

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 42.12 54.52 3.37

AFM Ratio = 100

Sample=? X60 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.97	1.031
Al2O3	25.94	2.722
SiO2	59.73	5.317
K2O	.65	.074
CaO	7.67	.732
Total	100.07	9.8746

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 39.85 56.12 4.03

AFM Ratio = 100

Sample=? X60 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.57	.964
Al2O3	26.58	2.798
SiO2	58.69	5.242
K2O	.58	.066
CaO	8.39	.803
Total	101.07	9.8736

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 43.81 52.59 3.6

AFM Ratio = 100

Sample=? X60 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.7	.987
Al2O3	26.54	2.791
SiO2	58.72	5.24
K2O	.56	.064
CaO	8.44	.807
Total	100.17	9.8892

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 43.43 53.12 3.44

AFM Ratio = 100

Sample=? X60 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.22	1.072
Al2O3	25.71	2.694
SiO2	60.16	5.348
K2O	.68	.077
CaO	7.24	.689
Total	99.07	9.8799

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 37.49 58.32 4.19

AFM Ratio = 100

Sample=? X60 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.45	.944
Al2O3	26.85	2.83
SiO2	58.25	5.207
K2O	.55	.063
CaO	8.75	.839
Total	98.75	9.8815

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 45.45 51.14 3.41

AFM Ratio = 100

Sample=? X60 ANOTHER FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.94	1.024
Al2O3	25.75	2.698
SiO2	60.19	5.349
K2O	.69	.078
CaO	7.39	.704
Total	100.03	9.8532

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 38.98 56.7 4.32

AFM Ratio = 100

Sample=? X60 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.77	1.169
Al2O3	24.66	2.589
SiO2	61.11	5.444
K2O	.94	.106
CaO	6.19	.591
Total	99.26	9.8991

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 31.67 62.65 5.68

AFM Ratio = 100

Sample=? X60 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.46	.949
Al2O3	27.3	2.881
SiO2	57.55	5.152
K2O	.56	.064
CaO	9.05	.869
Total	99.84	9.9143

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 46.17 50.43 3.4

AFM Ratio = 100

Sample=? X60 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.03	1.045
Al2O3	26.36	2.778
SiO2	58.64	5.242
K2O	.64	.072
CaO	8.24	.789
Total	98.75	9.9276

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 41.4 54.83 3.78

AFM Ratio = 100

X60

Sample=? X60 RIM AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.14	.61
MgO	11.26	2.465
Al2O3	13.06	2.26
SiO2	43	6.314
K2O	1.36	.255
CaO	11.64	1.834
TiO2	.98	.109
MnO	.3	.037
FeO	16.24	1.994
TOTAL	97.59	15.878

MG/MG+FE= 55.28

CA: MG: FE = 29.14 39.17 31.69

CA: NA: K = 67.95 22.6 9.45

Sample=? X60 INNER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.29	.646
MgO	12.39	2.683
Al2O3	13.74	2.352
SiO2	43.36	6.3
K2O	.87	.161
CaO	11.8	1.836
TiO2	.62	.067
MnO	.32	.04
FeO	14.63	1.777
TOTAL	96.65	15.862

MG/MG+FE= 60.16

CA: MG: FE = 29.16 42.61 28.22

CA: NA: K = 69.47 24.44 6.09

Sample=? X60 INNER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.05	.576
MgO	12.77	2.76
Al2O3	12.53	2.141
SiO2	44.45	6.445
K2O	1.12	.207
CaO	11.87	1.843
TiO2	.58	.064
MnO	.28	.035
FeO	14.33	1.738
TOTAL	96.79	15.809

MG/MG+FE= 61.36

CA: MG: FE = 29.06 43.53 27.41

CA: NA: K = 70.18 21.93 7.88

Sample=? X60 INNER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.36	.667
MgO	11.76	2.556
Al2O3	14.42	2.479
SiO2	42.66	6.227
K2O	1.12	.208
CaO	11.77	1.839
TiO2	.63	.07
MnO	.27	.034
FeO	13	1.83
TOTAL	97.64	15.905

MG/MG+FE= 58.28

CA: MG: FE = 29.54 41.06 29.4

CA: NA: K = 67.76 24.58 7.66

Sample=? X60 INNER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.32	.653
MgO	12.29	2.66
Al2O3	13.72	2.348
SiO2	43.51	6.32
K2O	.93	.172
CaO	11.87	1.847
TiO2	.53	.058
MnO	.31	.038
FeO	14.54	1.766
TOTAL	96.08	15.862

MG/MG+FE= 60.1

CA: MG: FE = 29.44 42.4 28.15

CA: NA: K = 69.12 24.44 6.44

Sample=? X60 INNER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.36	.665
MgO	12.32	2.67
Al2O3	13.74	2.354
SiO2	43.32	6.298
K2O	1.04	.192
CaO	11.82	1.842
TiO2	.62	.067
FeO	14.79	1.799
TOTAL	95.68	15.887

MG/MG+FE= 59.74

CA: MG: FE = 29.19 42.31 28.5

CA: NA: K = 68.25 24.44 7.11

Sample=? X60 RIM AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.06	.588
MgO	10.98	2.406
Al2O3	14.83	2.57
SiO2	41.78	6.142
K2O	1.22	.228
CaO	11.59	1.825
TiO2	.63	.07
MnO	.32	.04
FeO	16.57	2.037
TOTAL	97.93	15.906

MG/MG+FE= 54.15

CA: MG: FE = 29.12 38.39 32.5

CA: NA: K = 69.1 22.26 8.63

Sample=? X60 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.79	.505
MgO	12.39	2.682
Al2O3	13.36	2.287
SiO2	43.79	6.361
K2O	1.17	.217
CaO	11.81	1.838
TiO2	.62	.067
MnO	.3	.037
FeO	14.78	1.796
TOTAL	97.7	15.79

MG/MG+FE= 59.89

CA: MG: FE = 29.1 42.46 28.44

CA: NA: K = 71.8 19.73 8.48

Sample=? X60 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.83	.521
MgO	11.61	2.536
Al2O3	12.57	2.171
SiO2	43.64	6.396
K2O	1.58	.295
CaO	11.45	1.797
TiO2	.87	.096
MnO	.32	.04
FeO	16.12	1.976
TOTAL	94.17	15.828

MG/MG+FE= 56.21

CA: MG: FE = 28.48 40.2 31.32

CA: NA: K = 68.77 19.94 11.29

Sample=? X60 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.83	1.667
MgO	.33	.043
Al2O3	21.18	2.184
SiO2	66.66	5.83
CaO	2	.188
TOTAL	97.96	9.912

MG/MG+FE= 100

CA: MG: FE = 81.39 18.61 0

CA: NA: K = 10.13 89.87 0

Sample=? X60 PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.74	1.165
Al2O3	25.41	2.67
SiO2	59.94	5.342
K2O	.66	.075
CaO	7.23	.691
TOTAL	98	9.943

CA: MG: FE = 100 0 0

CA: NA: K = 35.78 60.33 3.88

X60, X61

Sample=? X60 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.78	.499
MgO	12.65	2.728
Al2O3	13.21	2.252
SiO2	44.35	6.415
K2O	1.26	.233
CaO	11.71	1.815
TiO2	.65	.071
MnO	.28	.035
FeO	14.11	1.707
TOTAL	95.01	15.755

MG/MG+FE= 61.51

CA: MG: FE = 29.04 43.65 27.31

CA: NA: K = 71.26 19.59 9.15

Sample=? X60PLAGIOCLASE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.28	1.424
MgO	.33	.044
Al2O3	22.35	2.337
SiO2	63.43	5.627
K2O	1.05	.119
CaO	4.16	.395
FeO	.41	.031
TOTAL	99.66	9.977

MG/MG+FE= 58.67

CA: MG: FE = 84.04 9.36 6.6

CA: NA: K = 20.38 73.48 6.14

Sample=? X60 AMPHIBOLE GRANULAR ZONE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.06	.594
MgO	9.73	2.155
Al2O3	15.02	2.63
SiO2	40.52	6.017
K2O	1.61	.306
CaO	11.59	1.844
TiO2	1.57	.175
MnO	.36	.045
FeO	17.53	2.178
TOTAL	98.97	15.944

MG/MG+FE= 49.73

CA: MG: FE = 29.85 34.89 35.26

CA: NA: K = 67.2 21.65 11.15

Sample=? X60 REPEAT ABOVE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.54	.438
MgO	10.71	2.348
Al2O3	13.57	2.351
SiO2	42.74	6.285
K2O	1.64	.307
CaO	11.85	1.867
TiO2	1.08	.12
MnO	.37	.047
FeO	16.48	2.027
TOTAL	95.89	15.79

MG/MG+FE= 53.67

CA: MG: FE = 29.91 37.62 32.47

CA: NA: K = 71.48 16.77 11.75

Sample=? X60\? OUTER AMPHIBOLE\? OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.68	.477
MgO	11.38	2.478
Al2O3	13.43	2.314
SiO2	43.36	6.336
K2O	1.31	.245
CaO	11.87	1.858
TiO2	.85	.093
MnO	.4	.05
FeO	15.7	1.918
TOTAL	94.17	15.769

MG/MG+FE= 56.37

CA: MG: FE = 29.71 39.62 30.67

CA: NA: K = 72.02 18.49 9.5

Sample=? X60 ANOTHER OUTER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.62	.454
MgO	12.17	2.627
Al2O3	12.74	2.174
SiO2	44.73	6.477
K2O	.88	.162
CaO	11.95	1.854
TiO2	.72	.078
MnO	.36	.044
FeO	14.83	1.796
TOTAL	93.47	15.666

MG/MG+FE= 59.39

CA: MG: FE = 29.54 41.85 28.61

CA: NA: K = 75.06 18.38 6.56

Sample=? X60 ANOTHER OUTER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.79	.512
MgO	10.4	2.281
Al2O3	14.63	2.537
SiO2	41.93	6.17
K2O	1.39	.26
CaO	11.89	1.875
TiO2	1.03	.114
MnO	.39	.048
FeO	16.57	2.039
TOTAL	94.19	15.836

MG/MG+FE= 52.8

CA: MG: FE = 30.27 36.82 32.91

CA: NA: K = 70.83 19.34 9.82

Sample=? X60ANOTHER INNER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.82	.507
MgO	13.36	2.863
Al2O3	11.07	1.875
SiO2	46.36	6.661
K2O	.71	.13
CaO	12.15	1.87
TiO2	.7	.076
FeO	13.84	1.664
TOTAL	93.57	15.646

MG/MG+FE= 63.24

CA: MG: FE = 29.23 44.76 26.01

CA: NA: K = 74.59 20.22 5.19

Sample=? X60 ANOTHER INNER AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.68	.476
MgO	11.71	2.54
Al2O3	14.42	2.474
SiO2	42.98	6.256
K2O	1.6	.298
CaO	12.16	1.897
TiO2	.73	.08
FeO	14.72	1.792
TOTAL	93.56	15.813

MG/MG+FE= 58.63

CA: MG: FE = 30.45 40.78 28.77

CA: NA: K = 71.02 17.82 11.16

Sample=? X61 K-FELDSPAR PHENO... OXNO.=? -23

ELEM	OX	STRUCT
Na2O	.84	.15
Al2O3	18.05	1.965
SiO2	64.88	5.994
K2O	15.46	1.822
CaO	.77	.076
TOTAL	97.29	10.007

CA: MG: FE = 100 0 0

CA: NA: K = 3.71 7.32 88.96

Sample=? X61 GM. FELDSPAR OXNO.=? -23

ELEM	OX	STRUCT
Na2O	.92	.164
Al2O3	18.31	1.994
SiO2	64.63	5.971
K2O	15.36	1.811
CaO	.78	.078
TOTAL	97.4	10.018

CA: MG: FE = 100 0 0

CA: NA: K = 3.8 7.99 88.21

X70, JR

Sample=? X70 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
MgO	16.51	.907
Al2O3	1.03	.045
SiO2	52.93	1.95
CaO	24.62	.972
TiO2	.28	.008
FeO	4.44	.137
Total	99.61	4.0192

Mg/Mg+Fe= 86.88

Ca: Mg: Fe = 48.21 44.99 6.8

Ca: Na: K = 100 0 0

AFM Ratio = 2.11

Sample=? X70 GREEN PYROXENE\?

ELEM	OX	STRUCT
MgO	15.67	.865
Al2O3	1.72	.075
SiO2	52.17	1.932
CaO	24.19	.96
TiO2	.3	.008
FeO	5.89	.182
Total	100.03	4.0224

Mg/Mg+Fe= 82.62

Ca: Mg: Fe = 47.83 43.1 9.07

Ca: Na: K = 100 0 0

AFM Ratio = 3.46

Sample=? X70 BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	18.86	2.003
Al2O3	14.9	1.252
SiO2	38.69	2.757
K2O	10.4	.946
CaO	.65	.05
TiO2	2.16	.116
Cr2O3	.26	.015
MnO	.23	.014
FeO	13.7	.817
Total	97.31	7.9673

Mg/Mg+Fe= 71.03

Ca: Mg: Fe = 1.74 69.79 28.47

Ca: Na: K = 5.02 0 94.98

AFM Ratio = 18.17

Sample=? X70 ANOTHER BIOTITE\?

ELEM	OX	STRUCT
MgO	18.51	1.973
Al2O3	14.44	1.217
SiO2	39.1	2.795
K2O	10.58	.965
CaO	.54	.042
TiO2	1.73	.093
MnO	.26	.016
FeO	14.83	.887
Total	95.65	7.9865

Mg/Mg+Fe= 68.99

Ca: Mg: Fe = 1.45 67.99 30.57

Ca: Na: K = 4.17 0 95.83

AFM Ratio = 17.54

SAMPLE = ? JR-SPUN ASS .T GA\ .CT .=? -1

ELEM	OXS	STRUCT
AL2O3	13.44	2.0466
SIO2	68.42	5.8788
MGO	13.12	2.1744
CAO	.37	.0656
TIO2	.16	.0142
TOTAL	100.371	10.1796

SAMPLE = ? JR-GA8-CORE\ CNT .=? -1

ELEM	OXS	STRUCT
AL2O3	19.73	1.8774
SIO2	33.37	2.7913
CAO	10.09	1.4151
TIO2	.17	.0107
CR2O3	.03	.0019
FEO	27.86	1.9317
MGO	8.45	.1959
TOTAL	100.53	8.2601

SAMPLE = ? LUGPEC\? CNTL.=? -1

ELEM	OXS	STRUCT
NA2O	3.31	.3[illegible]
AL2O3	19.44	2.[illegible]
SIO2	66.23	5.[illegible]
K2O	9.94	1.1[illegible]
CAO	.32	.0311
CR2O3	.16	.0116
TOTAL	99.312	9.9840

SAMPLE = ? LUGPEGE CNTL.=? -1

ELEM	OXS	STRUCT
AL2O3	19.03	2.[illegible]
SIO2	65.37	6.[illegible]
K2O	14.37	1.[illegible]
CAO	.5	.048[illegible]
TIO2	.18	.013[illegible]
TOTAL	100.909	9.79809

TRACE ELEMENTS? 9

Sample=? S3 CORE K-FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.56	.279
Al2O3	17.47	1.899
SiO2	65.39	6.031
K2O	14.4	1.694
CaO	1.04	.103
Total	101.37	10.006

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.96 13.44 81.6
AFM Ratio = 100

Sample=? S3 ESOLVED EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.02	1.367
Al2O3	18.83	1.951
SiO2	69.39	6.097
K2O	3.51	.393
Total	99.91	9.8077

Ca: Na: K = 0 77.67 22.33
AFM Ratio = 100

Sample=? S3 EXSOLVED LAYER NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.62	.29
Al2O3	17.7	1.919
SiO2	65.57	6.032
K2O	14.38	1.687
CaO	.69	.068
Total	105.5	9.9966

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.33 14.18 82.49
AFM Ratio = 100

Sample=? S3 ANOTHER FELDSPAR EXSOLVED LAMELLA

ELEM	OX	STRUCT
Na2O	8.42	1.438
Al2O3	18.83	1.954
SiO2	69.08	6.082
K2O	3.32	.373
Total	99.13	9.8463

Ca: Na: K = 0 79.4 20.6
AFM Ratio = 100

Sample=? S3 LAYER NEXT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.07	1.378
Al2O3	18.83	1.955
SiO2	68.93	6.072
K2O	3.78	.425
CaO	.23	.022
Total	100.04	9.8523

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.21 75.51 23.29
AFM Ratio = 100

Sample=? S3 LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.02	.534
Al2O3	17.61	1.896
SiO2	66.16	6.043
K2O	12.28	1.431
CaO	.73	.071
FeO	.21	.016
Total	99.65	9.9918
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 81.61 0 18.39
Ca: Na: K = 3.49 26.23 70.28
AFM Ratio = 98.34

Sample=? S3 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.06	.542
Al2O3	17.82	1.917
SiO2	66.09	6.032
K2O	12.22	1.423
CaO	.81	.079
Total	98.67	9.992

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.86 26.52 69.62
AFM Ratio = 100

Sample=? S3 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.64	.642
Al2O3	17.82	1.912
SiO2	66.32	6.038
K2O	11.25	1.307
CaO	.83	.081
Total	98.28	9.9802

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.99 31.63 64.38
AFM Ratio = 100

Sample=? S3 REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	2.07	.369
Al2O3	17.56	1.901
SiO2	65.7	6.033
K2O	13.58	1.591
CaO	1.04	.102
Total	101.74	9.9964

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.95 17.9 77.16
AFM Ratio = 100

Sample=? S3 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.96	1.031
Al2O3	19.2	2.019
SiO2	67.03	5.981
K2O	6.75	.768
CaO	.73	.07
TiO2	.3	.02
Total	102.18	9.8885

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.75 55.16 41.09
AFM Ratio = 100

Sample=? S3 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.17	1.558
Al2O3	19.18	1.98
SiO2	69.18	6.06
K2O	1.98	.222
FeO	.25	.019
Total	102.21	9.8392
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 0 0 100
Ca: Na: K = 0 87.53 12.47
AFM Ratio = 98.12

Sample=? S3 LAMELLA NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9	1.529
Al2O3	18.97	1.959
SiO2	69.49	6.088
K2O	2.15	.241
Total	102.35	9.817

Ca: Na: K = 0 86.38 13.62
AFM Ratio = 100

Sample=? S3 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.68	.301
Al2O3	17.67	1.925
SiO2	64.91	5.998
K2O	14.62	1.723
CaO	1.06	.105
Total	102.92	10.0521

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.93 14.14 80.93
AFM Ratio = 100

Sample=? S3 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.66	1.474
Al2O3	18.93	1.96
SiO2	69.01	6.061
K2O	2.86	.32
CaO	.2	.019
FeO	.31	.023
Total	102.75	9.8568
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 45.24 0 54.76
Ca: Na: K = 1.05 81.3 17.65
AFM Ratio = 97.71

Sample=? S3 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.8	.664
Al2O3	17.64	1.875
SiO2	67.68	6.101
K2O	9.99	1.149
CaO	.56	.054
FeO	.33	.025
Total	101.66	9.8681

Mg/Mg+Fe= 0
Ca: Mg: Fe = 68.35 0 31.65
Ca: Na: K = 2.89 35.57 61.54
AFM Ratio = 97.4

Sample=? S3ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.7	1.155
Al2O3	18.57	1.946
SiO2	68.21	6.065
K2O	6.15	.697
CaO	.27	.026
Total	102.96	9.8883

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.38 61.5 37.11
AFM Ratio = 100

Sample=? S3 LAMELLA NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.54	.793
Al2O3	18.62	1.977
SiO2	66.7	6.007
K2O	9.08	1.043
CaO	.67	.064
TiO2	.29	.019
Total	100.83	9.903

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.37 41.74 54.89
AFM Ratio = 100

Sample=? S4 OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.21	.217
Al2O3	17.67	1.925
SiO2	65.08	6.014
K2O	15.25	1.798
CaO	.78	.078
Total	100.57	10.0314

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.73 10.37 85.91
AFM Ratio = 100

Sample=? S4 LAMELLA NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.88	.51
Al2O3	17.71	1.907
SiO2	66.04	6.035
K2O	12.31	1.435
CaO	.69	.067
FeO	.39	.029
Total	98.57	9.9835

Mg/Mg+Fe= 0
Ca: Mg: Fe = 69.79 0 30.21
Ca: Na: K = 3.33 25.35 71.32
AFM Ratio = 97.05

Sample=? S4 LAMELLA IN FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.12	.552
Al2O3	17.9	1.926
SiO2	66.04	6.027
K2O	11.96	1.393
CaO	.85	.084
Total	99.36	9.9822

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.14 27.21 68.65
AFM Ratio = 100

Sample=? S4 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.27	1.569
Al2O3	19.31	1.987
SiO2	69.45	6.063
K2O	1.47	.164
CaO	.29	.027
Total	99.34	9.8099

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.53 89.15 9.32
AFM Ratio = 100

Sample=? S4 LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	6.92	1.195
Al2O3	18.53	1.946
SiO2	67.78	6.041
K2O	5.69	.647
CaO	.38	.036
FeO	.56	.042
Total	99.71	9.9073

Mg/Mg+Fe= 0
Ca: Mg: Fe = 46.15 0 53.85
Ca: Na: K = 1.92 63.63 34.45
AFM Ratio = 95.86

Sample=? S4 ANOTHER LAMELLA OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.18	1.555
Al2O3	18.96	1.953
SiO2	69.62	6.084
K2O	1.83	.204
FeO	.3	.022
Total	97.34	9.8184

Mg/Mg+Fe= 0
Ca: Mg: Fe = 0 0 100
Ca: Na: K = 0 88.4 11.6
AFM Ratio = 97.8

Sample=? S4 LAMELLA NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.6	.285
Al2O3	17.76	1.925
SiO2	65.52	6.026
K2O	14.33	1.681
CaO	.79	.078
Total	99.41	9.9948

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.82 13.94 82.24
AFM Ratio = 100

Sample=? S4REPEAT

ELEM	OX	STRUCT
Na2O	5.26	.917
Al2O3	18.29	1.94
SiO2	67.12	6.037
K2O	8.61	.988
CaO	.47	.045
FeO	.24	.018
Total	102.81	9.9456

Mg/Mg+Fe= 0
Ca: Mg: Fe = 71.43 0 28.57
Ca: Na: K = 2.31 47.03 50.67
AFM Ratio = 98.18

Sample=? S4 PYROXENE CENTRE

ELEM	OX	STRUCT
MgO	14.26	.796
Al2O3	1.16	.051
SiO2	52.12	1.951
K2O	.24	.011
CaO	24.2	.971
TiO2	.47	.013
FeO	7.16	.224
Total	102.68	4.0165

Mg/Mg+Fe= 78.04
Ca: Mg: Fe = 48.77 39.98 11.25
Ca: Na: K = 98.88 0 1.12
AFM Ratio = 2.44

Sample=? S5 FELDSPAR ABOUT CORE MINERAL

ELEM	OX	STRUCT
Na2O	8.22	1.396
Al2O3	21.94	2.266
SiO2	66.28	5.806
K2O	.66	.073
CaO	2.71	.254
Total	100.31	9.7957

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 14.74 81.02 4.24

AFM Ratio = 100

Sample=? S5\? BIOTITE AGAIN OXNO.=? -11

ELEM	OX	STRUCT
Na2O	.61	.074
MgO	3.12	.293
Al2O3	26.12	1.938
SiO2	56.64	3.565
K2O	6.68	.537
CaO	.55	.037
FeO	6.21	.327
Total	90.1	6.7712

Mg/Mg+Fe= 47.26

Ca: Mg: Fe = 5.63 44.6 49.77

Ca: Na: K = 5.71 11.42 82.87

AFM Ratio = 60.98

Sample=? T541 GLASS OXNO.=? -10

ELEM	OX	STRUCT
Na2O	1.75	.186
MgO	.66	.054
Al2O3	18.03	1.16
SiO2	69.82	3.814
K2O	2.14	.149
CaO	4.97	.291
FeO	2.62	.12
TOTAL	83.37	5.774

MG/MG+FE= 31.03

CA: MG: FE = 62.58 11.61 25.81

CA: NA: K = 46.49 29.71 23.8

ELEM	OX	STRUCT
Na2O	2.01	.435
MgO	11.31	1.71
Al2O3	15.32	1.833
SiO2	42.21	4.782
K2O	.75	.134
CaO	11.34	1.255
TiO2	.47	.031
MnO	.28	.024
FeO	15.5	1.515
TOTAL	96.49	11.028

MG/MG+FE= 52.53

CA: MG: FE = 29.32 39.95 30.72

CA: NA: K = 69.22 20.19 6.78

Sample=? T-541AMPHIBOLE\ OXNO.=? -23

ELEM	OX	STRUCT
Na2O	1.86	.514
MgO	12.93	2.749
Al2O3	12.17	2.045
SiO2	47.02	6.705
K2O	.84	.153
CaO	11.45	1.749
TiO2	.57	.061
FeO	13.17	1.571
TOTAL	93.4	15.547

MG/MG+FE= 63.63

CA: MG: FE = 28.82 45.3 25.89

CA: NA: K = 72.39 21.27 6.33

Sample=? T541 AMPHIBOLE OXNO.=?

ELEM	OX	STRUCT
Na2O	2.01	.554
MgO	9.85	2.089
Al2O3	15.91	2.669
SiO2	46.21	6.576
K2O	1.16	.21
CaO	10.66	1.626
TiO2	.63	.068
FeO	13.6	1.618
TOTAL	94.11	15.41

MG/MG+FE= 56.35

CA: MG: FE = 30.49 39.17 30.34

CA: NA: K = 68.03 23.18 8.79

Sample=? T-541 AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.05	.577
MgO	12.02	2.604
Al2O3	13.45	2.304
SiO2	43.9	6.378
K2O	1.4	.259
CaO	11.59	1.804
TiO2	.68	.075
FeO	14.91	1.812
TOTAL	93.09	15.813

MG/MG+FE= 58.97

CA: MG: FE = 29 41.86 29.13

CA: NA: K = 68.33 21.86 9.81

Sample=? T541 ANOTHER AMPHIBOLE OXNO.=?

ELEM	OX	STRUCT
Na2O	1.79	.474
MgO	6.58	1.337
Al2O3	16.93	2.719
SiO2	53.8	7.332
K2O	1.26	.22
CaO	9.3	1.359
TiO2	.42	.043
FeO	9.91	1.129
TOTAL	96.66	14.613

MG/MG+FE= 54.22

CA: MG: FE = 35.53 34.95 29.52

CA: NA: K = 66.2 23.09 10.72

Sample=? T-541 COARSE AMPHIBOLE OXNO.=? -23

ELEM	OX	STRUCT
Na2O	2.02	.567
MgO	12.73	2.745
Al2O3	12.75	2.174
SiO2	44.6	6.45
K2O	1.04	.191
CaO	11.73	1.817
TiO2	.72	.078
MnO	.3	.036
FeO	14.1	1.705
TOTAL	92.17	15.763

MG/MG+FE= 61.69

CA: MG: FE = 28.99 43.8 27.21

CA: NA: K = 70.56 22.02 7.42

Sample=? T541 GLASS OXNO.=?

ELEM	OX	STRUCT
Na2O	1.31	.16
MgO	.13	.035
Al2O3	18.42	1.18
SiO2	69.59	3.8
K2O	2.13	.149
CaO	5.11	.299
FeO	2.73	.125
TOTAL	81.72	5.758

MG/MG+FE= 21.87

CA: MG: FE = 65.14 7.63 27.23

CA: NA: K = 49.18 26.32 24.51

Sample=? T541 GLASS OXNO.=?

ELEM	OX	STRUCT
Na2O	2.04	.319
MgO	.11	.034
Al2O3	19.33	1.194
SiO2	69.18	3.79
K2O	2.15	.132
CaO	5.09	.299
FeO	2.73	.125
TOTAL	92.54	5.893

MG/MG+FE= 21.78

CA: MG: FE = 65.26 7.42 27.32

CA: NA: K = 44.63 32.49 22.88

T541, T860

Sample=? T541 OXNO.=? -10

ELEM	OX	STRUCT
Na2O	2.49	.337
Al2O3	18.33	1.172
SiO2	69.99	6.852
K2O	2.01	.161
CaO	5.37	.291
FeO	2.61	.119
TOTAL	99.38	8.772

Mg/Mg+Fe= 0

Ca: Na: K = 70.98 0 29.02

Ca: Na: K = 98.08 3.92 21.02

Sample=? T860 GN 2 PT 2 CORE OXNO.=? -12

ELEM	OX	STRUCT
MgO	.31	.038
Al2O3	14.03	1.366
SiO2	36.75	3.034
K2O	.24	.025
CaO	17.91	1.584
TiO2	1.97	.122
MnO	16.3	1.14
FeO	12.5	.863
Total	99.4	8.1734

Ca: Mg: Fe = 63.74 1.53 34.73

Mg/Mg+Fe= 4.22

Sample=? T 860 GN3\ OXNO.=? -12

ELEM	OX	STRUCT
MgO	.32	.039
Al2O3	12.73	1.25
SiO2	36.64	3.051
K2O	.28	.03
CaO	18.3	1.633
TiO2	2.01	.126
MnO	16.33	1.152
FeO	13.4	.933
Total	99.57	8.2128

Ca: Mg: Fe = 62.69 1.5 35.82

Mg/Mg+Fe= 4.01

Sample=? T 860 GN4 PT OXNO.=? -12

ELEM	OX	STRUCT
MgO	.37	.046
Al2O3	13.37	1.307
SiO2	36.51	3.028
K2O	.2	.022
CaO	18.62	1.655
TiO2	2.02	.126
MnO	15.52	1.09
FeO	13.39	.929
Total	101.06	8.2031

Ca: Mg: Fe = 62.93 1.75 35.32

Mg/Mg+Fe= 4.72

Sample=? T860 GARNET/ 1 OXNO.=? -12

ELEM	OX	STRUCT
Na2O	.61	.097
MgO	.51	.062
Al2O3	15.82	1.521
SiO2	37.3	3.043
K2O	.38	.039
CaO	17.29	1.512
TiO2	1.08	.066
MnO	15.94	1.102
FeO	11.07	.755
Total	98.91	8.1974

Ca: Mg: Fe = 64.92 2.66 32.42

Ca: Na: K = 91.75 5.89 2.37

Mg/Mg+Fe= 7.59

Sample=? T860 SPESSARTITE\ OXNO.=? -24

ELEM	OX	STRUCT
MgO	.31	.077
Al2O3	11.69	2.298
SiO2	37.02	6.174
K2O	.29	.061
CaO	21.7	3.879
TiO2	1.35	.17
MnO	12.81	1.81
FeO	14.83	2.068
Total	100.03	16.5376

Mg/Mg+Fe= 3.59

Ca: Mg: Fe = 64.39 1.28 34.33

Ca: Na: K = 98.45 0 1.55

Sample=? T860 K-FELDSPAR\ OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.29	.41
Al2O3	18.88	2.056
SiO2	63.28	5.844
K2O	12.42	1.463
CaO	.96	.095
TiO2	.48	.033
MnO	.33	.026
FeO	1.36	.105
Total	101.34	10.0311

Mg/Mg+Fe= 0

Ca: Mg: Fe = 47.5 0 52.5

Ca: Na: K = 4.83 20.83 74.34

Sample=? 70-181 CENTRE OF ABOVE GRAIN

ELEM	OX	STRUCT
Na2O	5.52	.959
Al2O3	27.94	2.952
SiO2	56.64	5.077
K2O	.21	.024
CaO	9.64	.926
Total	102.52	9.9379

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 48.51 50.24 1.26

AFM Ratio = 100

Sample=? 70-181 ANOTHER SPOT SAME GRAIN

ELEM	OX	STRUCT
Na2O	4.67	.82
Al2O3	28.48	3.039
SiO2	54.74	4.955
K2O	.72	.083
CaO	10.71	1.039
FeO	.54	.041
Total	101.38	9.9773
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 96.2 0 3.8

Ca: Na: K = 53.5 42.22 4.27

AFM Ratio = 97.37

Sample=? 70-181 EDGE CLEARER ZONE OF ABOVE

ELEM	OX	STRUCT
Na2O	9.49	1.607
Al2O3	20.66	2.128
SiO2	67.72	5.916
K2O	.44	.049
CaO	1.59	.149
Total	102.81	9.8487

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 8.25 89.03 2.71

AFM Ratio = 100

Sample=? 70-181ANOTHER PLAG. GRAIN

ELEM	OX	STRUCT
Na2O	4.34	.761
Al2O3	29.03	3.096
SiO2	53.99	4.886
K2O	.26	.03
CaO	11.89	1.153
FeO	.47	.036
Total	103.15	9.9615
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 96.97 0 3.03

Ca: Na: K = 59.31 39.15 1.54

AFM Ratio = 97.73

Sample=? 70-181ANOTHER GRAIN CENTRE

ELEM	OX	STRUCT
Na2O	4.5	.789
Al2O3	28.36	3.024
SiO2	54.79	4.956
K2O	.42	.048
CaO	11.14	1.08
FeO	.7	.053
Total	100.87	9.9506
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 95.32 0 4.68

Ca: Na: K = 56.34 41.16 2.5

AFM Ratio = 96.61

Sample=? 70-181 RIM K-FELDSPAR

ELEM	OX	STRUCT
Na2O	1.83	.327
Al2O3	18.43	2.003
SiO2	64.55	5.952
K2O	14.33	1.685
CaO	.86	.085
Total	101.23	10.0528

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.05 15.59 80.35

AFM Ratio = 100

Sample=? 70-181 FELDSPAR GRAIN

ELEM	OX	STRUCT
Na2O	7.95	1.365
Al2O3	19.35	2.02
SiO2	67.77	6.002
K2O	4.37	.494
CaO	.39	.037
Total	102.97	9.9177

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 1.95 71.99 26.05

AFM Ratio = 100

Sample=? 70-181 GRAIN NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	8.97	1.525
Al2O3	21.58	2.231
SiO2	66.29	5.815
K2O	.52	.058
CaO	2.46	.232
Total	102.93	9.8607

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 12.78 84.02 3.2

AFM Ratio = 100

Sample=? 70-181 FELDSPAR GRAIN CENTRE

ELEM	OX	STRUCT
Na2O	4.5	.788
Al2O3	28.81	3.064
SiO2	54.83	4.947
K2O	.27	.031
CaO	11.38	1.1
Total	102.57	9.93

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 57.32 41.06 1.62

AFM Ratio = 100

Sample=? 70-181 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	2.65	.471
Al2O3	17.87	1.929
SiO2	65.65	6.011
K2O	12.62	1.475
CaO	.89	.087
FeO	.32	.025
Total	103.53	9.9969
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 77.68 0 22.32

Ca: Na: K = 4.28 23.17 72.55

AFM Ratio = 97.47

Sample=? 70-181 ANOTHER GRAIN CENTRE

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.35	.927
Al2O3	27.47	2.897
SiO2	58.12	5.199
K2O	1.24	.141
CaO	7.31	.701
FeO	.28	.021
Total	102	9.8866
Mg/Mg+Fe=	0	

Ca: Mg: Fe = 97.09 0 2.91

Ca: Na: K = 39.63 52.4 7.97

AFM Ratio = 98.57

Sample=? 70-181 EDGE OF LATH GRAIN

OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.26	1.57
Al2O3	21.01	2.166
SiO2	67.16	5.874
K2O	.54	.06
CaO	2.01	.189
Total	100.26	9.8587

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 10.39 86.31 3.3

AFM Ratio = 100

Sample=? 70-181 FELDSPAR

ELEM	OX	STRUCT
Na2O	9.64	1.639
MgO	.46	.06
Al2O3	19.62	2.028
SiO2	67.86	5.95
K2O	.78	.088
CaO	.99	.093
FeO	.59	.043
Total	100.65	9.8999
Mg/Mg+Fe=	58.25	

Ca: Mg: Fe = 47.45 30.61 21.94

Ca: Na: K = 5.11 90.05 4.84

AFM Ratio = 90.78

Sample=? 70-181 CORE OF PLAGIOCLASE

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	4.17	.731	
Al2O3	28.52	3.035	
SiO2	55.08	4.973	
K2O	.66	.076	
CaO	11.01	1.065	
FeO	.44	.033	
Total	97.73	9.9131	
Mg/Mg+Fe=	0		
Ca: Mg: Fe =	96.99	0	3.01
Ca: Na: K =	56.89	39.05	4.06
AFM Ratio =	97.87		

Sample=? 70-181 FELDSPAR MANTLING ABOVE

ELEM	OX	STRUCT	OXNO.=? -16
Na2O	1.75	.312	
Al2O3	17.95	1.949	
SiO2	65.08	5.996	
K2O	14.37	1.69	
CaO	.85	.084	
Total	102.55	10.0305	
Ca: Mg: Fe =	100	0	0
Ca: Na: K =	4.03	14.96	81.02
AFM Ratio =	100		

Sample=? 70-181 CORE PLAGIOCLASE

ELEM	OX	STRUCT
Na2O	4.35	.764
Al2O3	29.01	3.094
SiO2	54.08	4.895
K2O	.43	.049
CaO	11.99	1.163
Total	98.65	9.9648
Ca: Mg: Fe =	100	0	0
Ca: Na: K =	58.86	38.66	2.48
AFM Ratio =	100		

Sample=? 70-181 FELDSPAR MANTLING ABOVE

ELEM	OX	STRUCT
Na2O	2.37	.423
Al2O3	17.62	1.909
SiO2	65.46	6.017
K2O	13.22	1.55
CaO	.67	.066
FeO	.66	.051
Total	102.08	10.0152
Mg/Mg+Fe=	0	
Ca: Mg: Fe =	56.41	0	43.59
Ca: Na: K =	3.24	20.75	76.02
AFM Ratio =	94.93		

Sample=? 70-181 FELDSPAR GRAIN LARGE

ELEM	OX	STRUCT
Na2O	3.18	.563
Al2O3	18.17	1.954
SiO2	65.85	6.008
K2O	12.11	1.409
CaO	.7	.068
Total	102.19	10.0018
Ca: Mg: Fe =	100	0	0
Ca: Na: K =	3.33	27.6	69.07
AFM Ratio =	100		

Sample=? 70-181 FELDSPAR NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	7.29	1.258
Al2O3	24.1	2.528
SiO2	61.27	5.453
K2O	.66	.075
CaO	6.66	.635
Total	99.55	9.9497
Ca: Mg: Fe =	100	0	0
Ca: Na: K =	32.27	63.92	3.81
AFM Ratio =	100		

Sample=? 70-180 CLEAR EDGE TO ABOVE

ELEM	OX	STRUCT
Na2O	10.01	1.697
MgO	.27	.035
Al2O3	19.03	1.961
SiO2	68.95	6.027
K2O	.77	.086
CaO	.48	.045
FeO	.45	.033
Total	101.9	9.8837
Mg/Mg+Fe=	51.47	
Ca: Mg: Fe =	39.82	30.97	29.2
Ca: Na: K =	2.46	92.83	4.7
AFM Ratio =	93.51		

Sample=? 70-180 ANOTHER GRAIN CENTRE

ELEM	OX	STRUCT
Na2O	5.18	.902
Al2O3	28.08	2.976
SiO2	56.07	5.04
K2O	.36	.041
CaO	10.22	.984
Total	102.02	9.9432
Ca: Mg: Fe =	100	0	0
Ca: Na: K =	51.06	46.81	2.13
AFM Ratio =	100		

Sample=? 70-181 EDGE OF ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	2.99	.529
Al2O3	18.31	1.971
SiO2	65.55	5.989
K2O	12.27	1.43
CaO	.88	.086
Total	103.67	10.0051
Ca: Mg: Fe =	100	0	0
Ca: Na: K =	4.21	25.87	69.93
AFM Ratio =	100		

Sample=? 70-181 CLAER EDGE ABOUT PLAG. GRAIN

ELEM	OX	STRUCT
Na2O	9.68	1.64
MgO	.4	.052
Al2O3	20.39	2.101
SiO2	67.61	5.912
K2O	.53	.059
CaO	1.13	.105
FeO	.24	.018
Total	102.31	9.8872
Mg/Mg+Fe=	74.29	
Ca: Mg: Fe =	60	29.71	10.29
Ca: Na: K =	5.82	90.91	3.27
AFM Ratio =	93.75		

Sample=? c 70 -181clear feldspar rim

ELEM	OX	STRUCT
Na2O	8.12	1.389
Al2O3	19.94	2.073
SiO2	67.46	5.95
K2O	3.24	.364
CaO	1.2	.113
Total	100.05	9.889%
Ca: Mg: Fe =	100	0	0
Ca: Na: K =	6.06	74.44	19.51
AFM Ratio =	100		

Sample=? 70-181 feldspar grain in aggregate

ELEM	OX	STRUCT
Na2O	4.11	.72
Al2O3	29.49	3.136
SiO2	54.34	4.903
K2O	.27	.031
CaO	11.35	1.097
FeO	.22	.017
Total	101.64	9.9038
Mg/Mg+Fe=	0	
Ca: Mg: Fe =	98.47	0	1.53
Ca: Na: K =	59.36	38.96	1.68
AFM Ratio =	98.93		

Sample=? 70-181 another grain

ELEM	OX	STRUCT
Na2O	4.53	.792
MgO	.32	.043
Al2O3	28.44	3.018
SiO2	55.64	5.01
K2O	.96	.11
CaO	9.68	.934
FeO	.32	.024
Total	101.55	9.9315
Mg/Mg+Fe=	64.18	
Ca: Mg: Fe =	93.31	4.3	2.4
Ca: Na: K =	50.87	43.14	5.99
AFM Ratio =	95.75		

Sample=? 70-181 another clear feldspar

ELEM	OX	STRUCT
Na2O	1.12	.201
Al2O3	17.92	1.953
SiO2	64.68	5.982
K2O	15.18	1.791
CaO	1.1	.109
Total	102.33	10.0369

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.19 9.57 85.25

AFM Ratio = 100

Sample=? 70-181 core of a grain OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.49	.784
Al2O3	28.24	3
SiO2	55.81	5.03
K2O	.89	.102
CaO	9.8	.947
FeO	.65	.049
Total	101.94	9.9127

Mg/Mg+Fe= 0

Ca: Mg: Fe = 95.08 0 4.92

Ca: Na: K = 51.66 42.77 5.56

AFM Ratio = 96.84

Sample=? 70-182 PLAGIOCLASE CRYSTAL

ELEM	OX	STRUCT
Na2O	6.85	1.178
Al2O3	24.95	2.608
SiO2	61.28	5.434
K2O	.35	.04
CaO	6.43	.611
Total	100.84	9.8711

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 33.41 64.41 2.19

AFM Ratio = 100

Sample=? 70-182 ANOTHER GRAIN

ELEM	OX	STRUCT
Na2O	3.23	.572
Al2O3	18.17	1.956
SiO2	65.72	6.001
K2O	12.17	1.418
CaO	.71	.07
Total	102.63	10.0162

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.4 27.77 68.83

AFM Ratio = 100

Sample=? 70-182 CLEAR EDGE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	5.08	.887
Al2O3	28.21	2.996
SiO2	55.8	5.026
K2O	.39	.045
CaO	10.04	.969
FeO	.26	.019
Total	102.36	9.942

Mg/Mg+Fe= 0

Ca: Mg: Fe = 98.08 0 1.92

Ca: Na: K = 50.97 46.66 2.37

AFM Ratio = 98.75

Sample=? 70-182 CORE FELDSPAR

ELEM	OX	STRUCT
Na2O	4.7	.823
Al2O3	28.9	3.076
SiO2	54.59	4.929
K2O	.22	.026
CaO	11.4	1.103
Total	102.13	9.9573

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 56.51 42.16 1.33

AFM Ratio = 100

Sample=? 70-182 EDGE OF ABOVE

ELEM	OX	STRUCT
Na2O	7.13	1.228
Al2O3	23.48	2.459
SiO2	62.63	5.563
K2O	1.53	.174
CaO	5.09	.484
Total	100.73	9.9081

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 25.66 65.11 9.23

AFM Ratio = 100

Sample=? 70-182 RIM AROUND ABOVE

ELEM	OX	STRUCT
Na2O	3.97	.696
Al2O3	29.55	3.154
SiO2	53.54	4.848
K2O	.52	.06
CaO	12.06	1.17
FeO	.31	.023
Total	97.08	9.9529

Mg/Mg+Fe= 0

Ca: Mg: Fe = 98.07 0 1.93

Ca: Na: K = 60.75 36.14 3.12

AFM Ratio = 98.56

Sample=? 70-182 FELDSPAR

ELEM	OX	STRUCT
Na2O	4.72	.826
Al2O3	28.84	3.067
SiO2	54.82	4.945
K2O	.2	.023
CaO	11.22	1.084
Total	102.06	9.9461

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 56.08 42.73 1.19

AFM Ratio = 100

Sample=? 70-182 K-FELDSPAR

ELEM	OX	STRUCT
Na2O	3.08	.545
Al2O3	18.26	1.965
SiO2	65.66	5.996
K2O	12.23	1.424
CaO	.77	.076
Total	101.96	10.0061

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.72 26.65 69.63

AFM Ratio = 100

Sample=? 70-188 SMALL GRAIN OF FELDSPAR

ELEM	OX	STRUCT
Na2O	2.7	.479
Al2O3	18.71	2.015
SiO2	65.29	5.966
K2O	12.48	1.455
CaO	.81	.079
Total	98.01	9.9935

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.92 23.8 72.28

AFM Ratio = 100

Sample=? 70-188 ANOTHER FELDSPAR\?

ELEM	OX	STRUCT
Na2O	5.8	1.007
Al2O3	19.31	2.038
SiO2	66.72	5.974
K2O	7.32	.837
CaO	.77	.074
Total	98.43	9.929

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.86 52.5 43.64

AFM Ratio = 100

Sample=? 70-188 ANOTHER FELDSPAR LATH

ELEM	OX	STRUCT
Na2O	5.12	.893
Al2O3	19.26	2.042
SiO2	66.28	5.964
K2O	8.36	.959
CaO	.86	.083
Total	98.54	9.941

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.29 46.15 49.56

AFM Ratio = 100

Sample=? 70-188 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	1.74	.13
MgO	9.94	.572
Al2O3	1.55	.07
SiO2	50.58	1.953
CaO	21.01	.869
MnO	.71	.023
FeO	14.24	.46
Total	101.64	4.0771

Mg/Mg+Fe= 56.43

Ca: Mg: Fe = 45.71 30.09 24.2

Ca: Na: K = 86.99 13.01 0

AFM Ratio = 3.28

70-188,189,193,214

Sample=? 70-188 FELDSPAR GRAIN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	4.09	.721
Al2O3	19	2.034
SiO2	65.54	5.952
K2O	10.43	1.208
CaO	.83	.08
Total	98.43	9.9952

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.98 35.89 60.13

AFM Ratio = 100

Sample=? 70-189

ELEM	OX	STRUCT
Na2O	2.87	.218
MgO	7.64	.446
Al2O3	.95	.044
SiO2	50.67	1.984
CaO	18.46	.775
MnO	.34	.011
FeO	19.07	.624
Total	100.08	4.1025
Mg/Mg+Fe=		41.68

Ca: Mg: Fe = 42.01 24.17 33.82

Ca: Na: K = 78.05 21.95 0

AFM Ratio = 2.01

Sample=? REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	1.75	.132
MgO	9.27	.536
Al2O3	1.32	.06
SiO2	50.46	1.957
K2O	.33	.016
CaO	20.6	.856
MnO	.39	.013
FeO	15.89	.516
Total	99.96	4.0863
Mg/Mg+Fe=		50.95

Ca: Mg: Fe = 44.86 28.09 27.04

Ca: Na: K = 85.26 13.15 1.59

AFM Ratio = 2.77

Sample=? 70-189 REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	9.13	1.545
MgO	.58	.075
Al2O3	20.67	2.125
SiO2	67.61	5.898
K2O	.41	.046
CaO	1.37	.128
FeO	.23	.017
Total	99.9	9.8344
Mg/Mg+Fe=		81.52

Ca: Mg: Fe = 58.18 34.09 7.73

Ca: Na: K = 7.45 89.88 2.68

AFM Ratio = 92.03

Sample=? 70-189 ANOTHER PYROXENE

ELEM	OX	STRUCT
Na2O	3.97	.305
MgO	5.88	.348
Al2O3	.84	.039
SiO2	50.48	2.001
CaO	16.27	.691
MnO	.45	.015
FeO	22.12	.733
Total	100.68	4.132
Mg/Mg+Fe=		32.19

Ca: Mg: Fe = 39 19.64 41.37

Ca: Na: K = 69.38 30.62 0

AFM Ratio = 1.77

Sample=? 70-189 REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	1.71	.126
MgO	11.26	.64
Al2O3	.77	.044
SiO2	51.74	1.974
CaO	20.89	.854
MnO	.38	.012
FeO	13.04	.416
Total	100.21	4.067
Mg/Mg+Fe=		60.61

Ca: Mg: Fe = 44.71 33.51 21.78

Ca: Na: K = 87.14 12.86 0

AFM Ratio = 2.04

Sample=? 70-189 ANOTHER PYROXENE

ELEM	OX	STRUCT
Na2O	2.56	.195
MgO	7.15	.418
Al2O3	.95	.044
SiO2	50.6	1.987
CaO	18.26	.768
Cr2O3	.22	.007
MnO	.47	.016
FeO	19.78	.65
Total	100.96	4.0852
Mg/Mg+Fe=		39.14

Ca: Mg: Fe = 41.83 22.77 35.4

Ca: Na: K = 79.75 20.25 0

AFM Ratio = 2.02

Sample=? 70-193 BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	16.21	1.745
Al2O3	12.58	1.07
SiO2	39.8	2.872
K2O	10.05	.926
CaO	.6	.046
TiO2	3.18	.172
FeO	17.42	1.051
Total	95.27	7.8829
Mg/Mg+Fe=		62.41

Ca: Mg: Fe = 1.62 61.4 36.98

Ca: Na: K = 4.73 0 95.27

AFM Ratio = 16.06

Sample=? 70-193 FELDSPAR AGAINST ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.61	1.48
Al2O3	19.81	2.069
SiO2	66.64	5.905
K2O	2.68	.303
CaO	1.07	.102
TiO2	.24	.016
FeO	.84	.062
Total	98.86	9.9361
Mg/Mg+Fe=		0

Ca: Mg: Fe = 62.2 0 37.8

Ca: Na: K = 5.41 78.51 16.07

AFM Ratio = 94.35

Sample=? 70-193 FELDSPAR OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.51	1.613
Al2O3	20.57	2.121
SiO2	67.66	5.918
K2O	.35	.039
CaO	1.39	.131
FeO	.37	.027
Total	97.33	9.8483
Mg/Mg+Fe=		0

Ca: Mg: Fe = 82.91 0 17.09

Ca: Na: K = 7.35 90.47 2.19

AFM Ratio = 97.52

Sample=? 70-214 FELDSPAR K-FELDSPAR

ELEM	OX	STRUCT
Na2O	2.11	.376
Al2O3	18.41	1.989
SiO2	65.28	5.983
K2O	13.36	1.562
CaO	.83	.082
Total	101.82	9.9913

OXNO.=? -16

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.06 18.61 77.33

AFM Ratio = 100

Sample=? 70-214 SMALLER FELDSPAR GRAIN

ELEM	OX	STRUCT
Na2O	1.68	.3
Al2O3	18.41	1.994
SiO2	65	5.976
K2O	14.09	1.653
CaO	.82	.08
Total	102.93	10.0037

OXNO.=? -16

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.94 14.76 81.31

AFM Ratio = 100

70-214, 216, 220, 275, 290

Sample=? 70-214 ANOTHER SMALL GRAIN

ELEM	OX	STRUCT	
Na2O	2.34	.415	OXNO.=? -16
Al2O3	18.44	1.992	
SiO2	65.25	5.979	
K2O	13.12	1.534	
CaO	.81	.08	
Total	102.91	9.9996	

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.94 20.45 75.6

AFM Ratio = 100

Sample=? 70-216 FELDSPAR NEXT TO ABOVE

ELEM	OX	STRUCT	
Na2O	2.08	.372	OXNO.=? -16
Al2O3	17.95	1.946	
SiO2	65.24	6.001	
K2O	13.84	1.624	
CaO	.83	.081	
Total	101.91	10.0242	

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 3.9 17.91 78.19

AFM Ratio = 100

Sample=? 70-275 ANOTHER

ELEM	OX	STRUCT
Na2O	1.65	.294
Al2O3	18.17	1.974
SiO2	64.83	5.973
K2O	14.25	1.675
CaO	1.1	.109
Total	103.69	10.025

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 5.25 14.15 80.61

AFM Ratio = 100

Sample=? 70-275 ANOTHER SMALL FELDSPAR

ELEM	OX	STRUCT
Na2O	1.55	.278
Al2O3	17.82	1.938
SiO2	65.06	6.002
K2O	14.5	1.707
CaO	.98	.097
Total	100.61	10.0213

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 4.66 13.35 81.99

AFM Ratio = 100

Sample=? SPESSARTITE GARNET

ELEM	OX	STRUCT
Al2O3	21.77	4.03
SiO2	37.94	5.959
CaO	19.58	3.295
TiO2	.23	.027
MnO	18.07	2.404
FeO	2.18	.286
Total	101.74	15.9996

Mg/Mg+Fe= 0

Ca: Mg: Fe = 92.01 0 7.99

Ca: Na: K = 100 0 0

AFM Ratio = 87.57

Sample=? 71- 70-220 FELDSPAR

ELEM	OX	STRUCT	
Na2O	2.68	.477	OXNO.=? -16
Al2O3	18.38	1.99	
SiO2	64.61	5.935	
K2O	12.71	1.489	
CaO	1.63	.161	
Total	98.72	10.0525	

Ca: Mg: Fe = 100 0 0

Ca: Na: K = 7.57 22.43 70

AFM Ratio = 100

Sample=? 70-290 PLATEY GREEN MINERAL

ELEM	OX	STRUCT	
Na2O	3.96	.28	OXNO.=? -6
MgO	19.16	1.04	
Al2O3	1.81	.078	
SiO2	55.65	2.026	
K2O	1.06	.049	
CaO	8.6	.336	
MnO	.23	.007	
FeO	9.31	.284	
Total	99.75	4.0992	

Mg/Mg+Fe= 78.55

Ca: Mg: Fe = 20.24 62.65 17.11

Ca: Na: K = 50.53 42.11 7.37

AFM Ratio = 2.86

71 - 182,184

Sample=? 71-182 ZEOLITE??? OXNO.=? -10

ELEM	OX	STRUCT
Na2O	9.92	1.044
Al2O3	19.31	1.236
SiO2	70.04	3.804
K2O	.46	.032
Total	99.75	6.1163

Ca: Na: K = 0 97.03 2.97
AFM Ratio = 100

Sample=? 71-182 BIREFRINGENT MINERAL OXNO.=? -17

ELEM	OX	STRUCT
Na2O	8.12	1.686
MgO	.21	.033
Al2O3	.28	.035
SiO2	56.71	6.071
CaO	32.37	3.712
Cr2O3	.28	.024
MnO	2	.181
Total	97.44	11.7428

Mg/Mg+Fe= 100
Ca: Mg: Fe = 99.12 .88 0
Ca: Na: K = 68.77 31.23 0
AFM Ratio = 34.65

Sample=? 71-182 MINERAL NEXT TO ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	1.93	.347
Al2O3	18.37	2.005
SiO2	64.08	5.932
K2O	14.54	1.717
CaO	.97	.096
Total	103.33	10.0978

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.44 16.06 79.49
AFM Ratio = 100

Sample=? 71-182 IST MINERAL AGAIN OXNO.=? -16

ELEM	OX	STRUCT
Na2O	10.02	1.69
Al2O3	19.36	1.985
SiO2	69.64	6.06
K2O	.42	.047
CaO	.36	.034
Total	101.47	9.8161

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.92 95.43 2.65
AFM Ratio = 100

Sample=? 71-184 MAGNETITE WITH ABOVE OXNO.=? -8

ELEM	OX	STRUCT
Na2O	.86	.154
MgO	.83	.113
Al2O3	1.37	.148
SiO2	.52	.047
TiO2	1.45	.1
MnO	.22	.017
FeO	94.76	7.276
Total	92.15	7.8555

Mg/Mg+Fe= 1.53
Ca: Mg: Fe = 0 1.53 98.47
Ca: Na: K = 0 100 0
AFM Ratio = .99

Sample=? REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	8.23	1.41
Al2O3	19.4	2.021
SiO2	67.34	5.949
K2O	3.44	.388
CaO	.67	.063
TiO2	.69	.046
FeO	.22	.016
Total	100.43	9.8935

Mg/Mg+Fe= 0
Ca: Mg: Fe = 79.75 0 20.25
Ca: Na: K = 3.39 75.77 20.85
AFM Ratio = 98.44

Sample=? 71-184 PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	4.46	.344
MgO	4.6	.273
Al2O3	1.25	.059
SiO2	50.86	2.023
K2O	.23	.012
CaO	14.39	.613
MnO	.56	.019
FeO	23.58	.784
Total	102.11	4.126

Mg/Mg+Fe= 25.83
Ca: Mg: Fe = 36.71 16.35 46.95
Ca: Na: K = 63.26 35.5 1.24
AFM Ratio = 2.72

Sample=? REPEAT ABOVE

ELEM	OX	STRUCT
Na2O	4.45	.343
MgO	4.58	.271
Al2O3	1.23	.057
SiO2	50.9	2.024
K2O	.23	.012
CaO	14.38	.613
MnO	.56	.019
FeO	23.61	.785
Total	99.87	4.1243

Mg/Mg+Fe= 25.66
Ca: Mg: Fe = 36.73 16.24 47.03
Ca: Na: K = 63.33 35.43 1.24
AFM Ratio = 2.63

Sample=? 71-184 ANOTHER PYROXENE OXNO.=? -6

ELEM	OX	STRUCT
Na2O	2.71	.207
MgO	6.73	.394
Al2O3	1.05	.049
SiO2	51.02	2.004
K2O	.59	.03
CaO	17.99	.757
MnO	.37	.012
FeO	19.43	.638
Total	99.69	4.0901

Mg/Mg+Fe= 38.18
Ca: Mg: Fe = 42.31 22.02 35.66
Ca: Na: K = 76.16 20.82 3.02
AFM Ratio = 2.32

Sample=? 71-184 BIOTITE AGAINST MAGNETITE

ELEM	OX	STRUCT
MgO	18.03	1.925
Al2O3	12.04	1.016
SiO2	41.33	2.96
K2O	10.39	.949
CaO	.54	.042
TiO2	1.38	.074
MnO	.25	.015
FeO	15.87	.951
Total	98.59	7.9319

Mg/Mg+Fe= 66.93
Ca: Mg: Fe = 1.44 65.97 32.59
Ca: Na: K = 4.24 0 95.76
AFM Ratio = 15.01

Sample=? 71-184 ANOTHER BIOTITE OXNO.=? -11

ELEM	OX	STRUCT
MgO	17.02	1.834
Al2O3	12.09	1.03
SiO2	40.49	2.926
K2O	10.44	.963
CaO	.44	.034
TiO2	1.74	.095
MnO	.24	.015
FeO	17.36	1.049
Total	96.81	7.9456

Mg/Mg+Fe= 63.61
Ca: Mg: Fe = 1.17 62.87 35.96
Ca: Na: K = 3.41 0 96.59
AFM Ratio = 15.16

71-184,262,305

Sample=? 71-184 GRANULAR K-FELDSPAR

ELEM	OX	STRUCT
Na2O	1.84	.329
Al2O3	18	1.953
SiO2	65.28	6.007
K2O	13.99	1.642
CaO	.72	.071
Total	100.09	10.0016

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.48 16.11 80.41
AFM Ratio = 100

Sample=? 71-184 PYROXENE OUTSIDE ABOVE

ELEM	OX	STRUCT
Na2O	3.72	.284
MgO	6.68	.392
Al2O3	1.02	.047
SiO2	51.07	2.009
CaO	16.42	.692
MnO	.47	.016
FeO	20.35	.669
Total	101.87	4.1092

OXNO.=? -6

Mg/Mg+Fe= 36.95
Ca: Mg: Fe = 39.48 22.36 38.16
Ca: Na: K = 70.9 29.1 0
AFM Ratio = 2.17

Sample=? 71-184 ANOTHER PYROXENE

ELEM	OX	STRUCT
Na2O	3.14	.238
MgO	7.71	.451
Al2O3	.63	.029
SiO2	50.91	1.997
CaO	17.63	.741
MnO	.4	.013
FeO	19.48	.639
Total	101.95	4.1081

OXNO.=? -6

Mg/Mg+Fe= 41.38
Ca: Mg: Fe = 40.47 24.63 34.9
Ca: Na: K = 75.69 24.31 0
AFM Ratio = 1.31

Sample=? 71-184 ANOTHER PYROXENE

ELEM	OX	STRUCT
Na2O	2.67	.202
MgO	8.25	.481
Al2O3	.41	.019
SiO2	50.99	1.994
CaO	18.91	.792
MnO	.35	.012
FeO	18.26	.597
Total	101.91	4.0975

OXNO.=? -6

Mg/Mg+Fe= 44.62
Ca: Mg: Fe = 42.35 25.72 31.93
Ca: Na: K = 79.68 20.32 0
AFM Ratio = .87

SAMPLE = ? 71-262 FELDSPAR

OXNO.=? -16

ELEM	OX%	STRUCT
AL2O3	18.25	1.9885
SIO2	64.45	5.9572
K2O	15.78	1.8607
CAO	.94	.0928
TIO2	.57	.0394
TOTAL	100.957	9.93859

SAMPLE = ? 71-262 FELDSPAR

OXNO.=? -16

ELEM	OX%	STRUCT
AL2O3	18.76	2.0339
SIO2	64.75	5.955
K2O	14.86	1.744
CAO	.83	.0813
TIO2	.42	.0288
FEO	.39	.0297
TOTAL	102.806	9.8727

Sample=? 71-305 PYROXENE

OXNO.=? -6

ELEM	OX	STRUCT
Na2O	.22	.016
MgO	15.47	.856
Al2O3	1.46	.064
SiO2	52.25	1.939
CaO	23.79	.946
TiO2	.45	.013
FeO	6.19	.192
Total	102.93	4.0246

Mg/Mg+Fe= 81.68
Ca: Mg: Fe = 47.44 42.93 9.63
Ca: Na: K = 98.34 1.66 0
AFM Ratio = 2.96

Sample=? 71-305 K-FELDSPAR

OXNO.=? 16

ELEM	OX	STRUCT
Na2O	1.66	.297
Al2O3	18.28	1.99
SiO2	64.38	5.948
K2O	14.26	1.681
CaO	1.32	.131
Total	99.17	10.0461

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 6.21 14.08 79.71
AFM Ratio = 100

Sample=? 71-305 ANOTHER GRAIN

ELEM	OX	STRUCT
Na2O	2.01	.359
Al2O3	18.56	2.014
SiO2	64.68	5.954
K2O	13.66	1.604
CaO	.91	.089
Total	102.44	10.0206

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.34 17.5 78.17
AFM Ratio = 100

Sample=? 71-305 ANOTHER GRAIN

OXNO.=? 16

ELEM	OX	STRUCT
Na2O	2.12	.377
Al2O3	18.63	2.015
SiO2	64.99	5.964
K2O	13.22	1.548
CaO	.88	.087
Total	102.9	9.991

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.32 18.74 76.94
AFM Ratio = 100

Sample=? 71-305 K-FELDSPAR

OXNO.=? 16

ELEM	OX	STRUCT
Na2O	1.83	.326
Al2O3	18.38	1.992
SiO2	64.98	5.974
K2O	13.85	1.624
CaO	.9	.089
Total	99.04	10.0052

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.36 15.99 79.65
AFM Ratio = 100

Sample=? 71-305 ANOTHER FELDSPAR

ELEM	OX	STRUCT
Na2O	2.01	.359
Al2O3	18.61	2.017
SiO2	64.7	5.949
K2O	13.73	1.61
CaO	.94	.093
Total	102.47	10.0274

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 4.51 17.41 78.08
AFM Ratio = 100

Sample=? 71-311

ELEM	OX	STRUCT
Na2O	6.06	1.052
Al2O3	18.76	1.978
SiO2	67.34	6.024
K2O	7.38	.842
CaO	.41	.039
Total	99.72	9.9342

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.02 54.42 43.56
AFM Ratio = 100

Sample=? 71-311 CLOUDY PART NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	6.67	1.148
Al2O3	18.91	1.979
SiO2	68.07	6.045
K2O	5.89	.668
CaO	.36	.034
Total	98.13	9.8737

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.84 62.05 36.11
AFM Ratio = 100

Sample=? REPEAT

ELEM	OX	STRUCT
Na2O	5.19	.905
Al2O3	18.45	1.954
SiO2	67.25	6.041
K2O	8.55	.98
CaO	.47	.045
Total	100.2	9.9248

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.33 46.89 50.78
AFM Ratio = 100

Sample=? 71-311 CLOUDY PART OXNO.=? -16

ELEM	OX	STRUCT
Na2O	3.14	.555
Al2O3	17.91	1.927
SiO2	66.12	6.035
K2O	12.15	1.415
CaO	.55	.054
Total	99.41	9.9863

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.67 27.42 69.91
AFM Ratio = 100

Sample=? 71-311 ANOTHER PART CLEAR FELDSPAR

ELEM	OX	STRUCT
Na2O	6.81	1.176
Al2O3	18.61	1.952
SiO2	68.04	6.055
K2O	5.98	.679
CaO	.35	.034
Total	98.68	9.8959

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.8 62.26 35.94
AFM Ratio = 100

Sample=? 71-311 CLOUDY PART NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	7.33	1.257
Al2O3	19.29	2.009
SiO2	68.23	6.031
K2O	4.64	.524
CaO	.35	.033
Total	99.79	9.8543

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.82 69.29 28.89
AFM Ratio = 100

Sample=? 71-311 CLOUDY PART OTHER SIDE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	9.86	1.667
Al2O3	19.17	1.97
SiO2	69.78	6.082
K2O	.86	.095
Total	100.23	9.8142

Ca: Na: K = 0 94.61 5.39
AFM Ratio = 100

Sample=? 71-311 ANOTHER GRAIN CLEAR PART

ELEM	OX	STRUCT
Na2O	7.6	1.291
Al2O3	17.66	1.823
SiO2	70.72	6.195
K2O	3.76	.42
CaO	.21	.019
Total	102.3	9.7488

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 1.1 74.62 24.28
AFM Ratio = 100

Sample=? 71-311 CLOUDY PART NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	4.96	.866
Al2O3	18.3	1.942
SiO2	67.15	6.046
K2O	9.02	1.036
CaO	.46	.044
Total	99.83	9.9337

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.26 44.5 53.24
AFM Ratio = 100

Sample=? 71-311 CLEAR PART

ELEM	OX	STRUCT
Na2O	3.42	.603
Al2O3	17.98	1.928
SiO2	66.4	6.042
K2O	11.51	1.336
CaO	.57	.055
Total	101.63	9.9636

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.76 30.24 67
AFM Ratio = 100

Sample=? 71-311 CLOUDY PART NEXT TO ABOVE

ELEM	OX	STRUCT
Na2O	8.21	1.407
Al2O3	18.11	1.886
SiO2	68.69	6.069
K2O	3.05	.344
CaO	.64	.061
FeO	1.3	.096
Total	92.67	9.8631

Mg/Mg+Fe= 0
Ca: Mg: Fe = 38.85 0 61.15
Ca: Na: K = 3.37 77.65 18.98
AFM Ratio = 90.76

Sample=? REPEAT ABOVE OXNO.=? -16

ELEM	OX	STRUCT
Na2O	8.2	1.406
Al2O3	18.14	1.889
SiO2	68.67	6.068
K2O	3.06	.345
CaO	.64	.06
FeO	1.29	.095
Total	100.54	9.863

Mg/Mg+Fe= 0
Ca: Mg: Fe = 38.71 0 61.29
Ca: Na: K = 3.31 77.64 19.05
AFM Ratio = 90.86

Sample=? cy6 71-311 exsolved feldspar

ELEM	OX	STRUCT
Na2O	5.24	.913
Al2O3	18.54	1.966
SiO2	67.07	6.034
K2O	8.44	.969
CaO	.44	.043
Total	101.34	9.9247

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.23 47.43 50.34
AFM Ratio = 100

Sample=? 71-311 exsolved feldspar dark patch

ELEM	OX	STRUCT
Na2O	4.84	.845
Al2O3	18.2	1.931
SiO2	67.3	6.057
K2O	9.18	1.054
CaO	.42	.04
Total	99.84	9.9269

OXNO.=? -16

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.06 43.58 54.36
AFM Ratio = 100

Sample=? c71-311 exsolved feldspar\1

ELEM	OX	STRUCT
Na2O	4.64	.813
Al2O3	18.14	1.931
SiO2	66.99	6.049
K2O	9.6	1.106
CaO	.47	.045
Total	100.44	9.9444

OXNO.=? -16

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 2.29 41.4 56.31
AFM Ratio = 100

Sample=? 71-311 feldspar

ELEM	OX	STRUCT
Na2O	2.55	.454
Al2O3	17.53	1.896
SiO2	65.77	6.036
K2O	13.25	1.551
CaO	.62	.061
FeO	.27	.021
Total	100.4	10.0191

OXNO.=? -16

Mg/Mg+Fe= 0
Ca: Mg: Fe = 74.39 0 25.61
Ca: Na: K = 2.95 21.97 75.07

Sample=? 71-311 feldspar

ELEM	OX	STRUCT
Na2O	9.21	1.558
Al2O3	18.98	1.952
SiO2	69.83	6.093
K2O	1.46	.162
FeO	.36	.026
Total	99.22	9.7912

OXNO.=? -16

Mg/Mg+Fe= 0
Ca: Mg: Fe = 0 0 100
Ca: Na: K = 0 90.58 9.42
AFM Ratio = 97.41

Sample=? 71-311 exsolved lamella

ELEM	OX	STRUCT
Na2O	2.76	.489
Al2O3	17.92	1.933
SiO2	65.78	6.019
K2O	12.85	1.5
CaO	.69	.068
Total	100.38	10.0091

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.31 23.77 72.92

Sample=? 71-311 clear lamella

ELEM	OX	STRUCT
Na2O	3.77	.664
Al2O3	17.73	1.901
SiO2	66.52	6.048
K2O	11.21	1.3
CaO	.56	.055
FeO	.22	.016
Total	99.21	9.9837

OXNO.=? -16

Mg/Mg+Fe= 0
Ca: Mg: Fe = 77.46 0 22.54
Ca: Na: K = 2.72 32.89 64.39
AFM Ratio = 98.34

Sample=? 71-0311 clear lamella

ELEM	OX	STRUCT
Na2O	9.02	1.53
Al2O3	19.26	1.986
SiO2	69.45	6.076
K2O	1.87	.209
Total	97.52	9.8009

Ca: Na: K = 0 87.98 12.02
AFM Ratio = 100

Sample=? 71-311 cloudy lamella

ELEM	OX	STRUCT
Na2O	1.07	.192
Al2O3	17.8	1.94
SiO2	64.89	6.001
K2O	15.41	1.818
CaO	.83	.083
Total	99.27	10.0336

OXNO.=? -16

Ca: Mg: Fe = 100 0 0
Ca: Na: K = 3.97 9.17 86.86
AFM Ratio = 100

Appendix 5

SPECIMEN AND LOCALITY LIST

Catalogue of field specimens, analysed specimens and thin sections of specimens collected from the Port Cygnet alkaline rocks. Co-ordinates are given for the southwest corner (in metres^{-3}) of the kilometre square of the Australian Map Grid Zone 55 in which the specimen occurs. The field numbers are marked on the transparency, which may be laid over the enclosed geological map for precise identification of locality. Two maps derived from an enlarged air photograph are provided for the Regatta Point area, covering the squares 5218 504, and 5219 504. The scale of these maps is approximately 1:1500.

Thin sections are labelled ¶, and polished thin specimens †.

Field Specimen Number	UTGD No.	Co-ordinates ($x10^{-3}$) N	E	Rock Type
CY1	60267 †	5225	517	Syenite porphyry
CY2	60268 †	5225	517	"
CY3	60269 †	5225	517	Fine grained hornblende porphyry
CY4	60270 †	5225	517	Syenite porphyry
CY5	60147*†	5224	515	Syenite porphyry
CY5D	60146 †	5224	515	Dolerite
CY7A	60148*†	5216	504	Syenite porphyry
CY7D	60149*†	5216	504	"
CY7E	60150*†	5216	504	"
CY8	60151*†	5218	504	"
CY10	60152*†	5222	501	"
CY11	60153*†	5226	516	"
CY12	60343 †	5218	508	Sanidine porphyry
CY13	60154*†	5220	503	"
CY14	60155*†	5220	503	Syenite porphyry
CY15	60271 †	5220	503	Sanidine porphyry
CY16	60156*†	5220	503	"
CY17	60272 †	5223	502	Syenite porphyry
CY18	60157*†	5219	501	"
CY19	60158*†	5224	507	Sanidine porphyry
CY21	60159*†	5219	505	Syenite porphyry
CY22	60160*†	5219	505	Hornfels
CY23	60161*†	5219	505	Sanidine porphyry
CY24	60273 †	5220	519	Syenite porphyry
CY25	60162*†	5220	519	"
CY26	60163*†	5218	506	Leucocratic hybrid
CY27	60164*†	5218	506	Orthoclasite
CY28	60165*†	5218	506	Syenite aplite
CY29	60166*†	5218	506	Hybrid
CY30	60167*†	5218	506	Syenite aplite
CY31	60168*†	5218	506	Orthoclasite
CY32	60169*†	5218	506	Orthoclasite
CY33B	60170*†	5218	506	Hybrid
CY34	60171*†	5218	506	"
CY35	60172*†	5218	506	"
CY36	60173*†	5218	506	Melanocratic hybrid
CY38	60274 †	5215	504	Sanidine porphyry
CY39	60275 †	5215	504	"
CY40	60274*†	5217	506	"
CY42	60276 †	5218	506	Hornfels
CY43	60342 †	5218	506	"
CY44	60175*† 60176*†	5218	506	Sanidine porphyry
CY45	60177*†	5220	505	Syenite porphyry
CY45A	60178*†	5220	505	"
CY45B	60179*†	5220	505	"
CY45C	60180*†	5220	505	"
CY46	60181 †	5220	505	Sanidine porphyry

* analysed specimen
† polished thin section

Field Specimen Number	UTGD No.	Co-ordinates ($x10^{-3}$) N	E	Rock Type
CY47A	60182*†	5224	518	Syenite porphyry
CY47B	60183*†	5224	518	"
CY47C	60184*†	5224	518	"
CY48	60185*†	5224	518	"
CY49	60186*†	5225	519	"
CY50	60187*†	5215	505	Dolerite
CY51	60277*†	5223	520	Syenite porphyry
CY52	60188*†	5223	518	"
CY52D	60189*†	5223	517	Dolerite
CY53	60190*†	5222	516	Syenite porphyry
CY55	60191*†	5222	501	"
CY56	60192*†	5222	501	Sanidine porphyry
CY57	60193*†	5222	499	Dolerite
CY58	60278	5220	504	Sanidine porphyry
CY60	60194*†	5220	503	"
CY61	60195*†	5220	503	"
CY62	60196*†	5220	504	Syenite porphyry
CY63	60197*	5220	504	"
CY64	60198*†	5220	504	"
CY65	60279 †	5220	504	"
CY67	60199*†	5220	504	"
CY69	60200*†	5221	502	"
CY70	60201*†	5220	503	"
CY71	60280 †	5220	503	"
CY72	60281 †	5219	504	"
CY73	60202*†	5218	504	Sanidine porphyry
CY74	60203*†	5215	502	"
CY75	60204*†	5220	506	"
CY76	60205*†	5220	506	Syenite porphyry
CY78	60206*†	5217	506	Sanidine porphyry
CY79	60207*†	5217	506	Syenite porphyry
CY80	60208*†	5217	506	Sanidine porphyry
CY81	60209*†	5217	506	"
CY82	60210*†	5217	506	Hornfelsed sandstone
CY83	60211*†	5217	506	Syenite porphyry
CY84	60212*	5217	506	Sanidine porphyry
CY85a	60213*†	5217	506	"
CY85b	60214*†	5217	506	"
CY85c	60215*†	5217	506	"
CY86	60216*†	5217	506	"
CY87	60217*	5217	506	Syenite porphyry
CY88	60218*†	5216	506	"
CY89	60219*†	5215	502	"
CY90	60220*†	5215	502	"
CY91	60221*†	5217	500	Hornblende porphyry
CY92	60222*†	5217	500	Sanidine porphyry
CY94	60223*	5218	508	"
CY95	60224*†	5219	508	"
CY96	60225*†	5219	506	Aplite

* analysed specimen
† polished thin section

Field Specimen Number	UTGD No.	Co-ordinates ($x10^{-3}$) N	E	Rock Type
CY97	60226*†	5219	506	Aplite
CY98	60227*†	5216	506	Sanidine porphyry
CY99	60228*†	5216	506	Aplite
Cy101	60229*†	5219	506	Melanocratic hybrid
CY102	60230*†	5219	506	"
CY103	60231*†	5219	506	"
CY104	60232*†	5219	506	Hybrid
CY105	60233*†	5219	506	Melanocratic hybrid
CY106	60234*†	5219	506	"
CY107	60282 †	5219	506	"
CY108	60235*†	5219	506	"
CY109	60236*†	5219	506	"
CY110	60237*	5219	506	Hybrid rock
CY111	60238*†	5219	506	Melanocratic hybrid
CY113a	60239*†	5219	506	Leucocratic hybrid
CY113b	60240*†	5219	506	"
CY113c	60241*†	5219	506	"
CY114	60242*†	5219	506	"
CY115	60243*†	5219	506	"
CY116	60244*†	5219	506	"
CY117	60245*†	5219	506	Melanocratic hybrid
CY118	60246*†	5219	506	Altered dolerite
CY119	60283 †	5219	506	"
CY120	60247*†	5219	503	Syenite porphyry
CY121	60284	5219	506	Melanocratic hybrid
CY122	60285	5221	508	Sanidine porphyry
CY123	60248*†	5221	508	"
4	60249*†	5219	506	Hybrid
18	60250*†	5219	506	"
JR	60251*†¶	5218	506	Garnet trachyte
RP4	60252*¶	5218	506	Hybrid
RP10	60253*¶	5219	506	"
RP17A,B	60254*¶	5219	506	"
RP19	60255*¶	5219	506	"
RP20	60256 ¶	5219	506	"
RP20ple	60257*¶	5219	506	"
RP20dk	60258*¶	5219	506	"
RP25	60259*¶	5219	506	"
RP30	60260*¶	5219	506	"
S4	60261*†	5219	506	Syenite porphyry
S10	60262*†	5219	506	"
X44	60263*†	5217	506	Sanidine porphyry
X50	60264*†	5219	504	"
Amph2-Amph7	60265*†	5219	501	Amphibolite inclusions
H	60266 †	5218	506	Hornfels

* analysed specimen
† polished thin section
¶ thin section

Field Specimen Number	UTGD No.	Co-ordinates ($x10^{-3}$) N	E	Rock Type
70-181	60286 §	5219	506	Hybrid
182	60287 §	5219	506	"
183	60288 §	5219	506	Syenite-aplite
184	60289 §	5219	506	Hybrid
185	60290 §	5219	506	"
186	60291 §	5219	506	"
188	60292 §	5219	506	"
191	60293 §	5219	506	"
192B	60294 §	5219	506	"
193	60295 §	5219	506	"
194	60296 §	5219	506	Syenite-aplite
70-195	60297 §	5219	506	Hybrid
196	60298 §	5219	506	"
197	60299 §	5219	506	"
199	60344 §	5219	506	"
200	60300 §	5219	506	"
204	60301 §	5219	506	Aplite
205	60302 §	5219	506	"
208	60303 §	5219	506	"
210	60304 §	5219	506	Hybrid
211	60305 §	5219	506	"
70-213	60306 §	5219	506	"
214	60307 §	5219	506	"
215	60308 §	5219	506	"
216	60309 §	5219	506	"
218	60310 §	5219	506	"
219	60311 §	5219	506	"
220	60312 §	5219	506	"
221	60313 §	5219	506	"
223	60314 §	5219	506	"
224	60315 §	5219	506	"
70-228	60316 §	52.9	506	"
229	60317 §	5219	506	"
230	60318 §	5219	506	"
255	60319 §	5219	506	Aplite
275	60320 §	5219	506	"
71-172	60321 §	5219	506	Hybrid
175	60322 §	5217	506	Tinguaite
176	60323 §	5217	506	Syenite porphyry
177	60324 §	5217	506	Hybrid
179	60325 §	5217	506	Hornfels
71-180	60326 §	5217	506	Sanidine porphyry
181	60327 §	5219	506	Hybrid
182	60328 §	5219	506	Sanidine porphyry-tinguaite
183	60329 §	5219	506	Hybrid
184	60330 §	5219	506	"
185	60331 §	5219	506	Aplite
186	60332 §	5219	506	Hybrid
187	60333 §	5219	506	Aplite

§ thin section cut from Tasmanian Department of Mines specimens.

Field Specimen Number	UTGD No.	Co-ordinates ($x10^{-3}$) N	E	Rock Type
71-213	60334 §	5219	506	Fine-grained sanidine porphyry
245	60335 §	5219	506	Hybrid
246	60336 §	5219	506	"
247	60337 §	5219	506	"
248	60338 §	5219	506	"
249	60339 §	5219	506	"
252	60340 §	5217	506	Hornfels
254	60341 §	5217	506	Sanidine porphyry
255	62201 §	5217	506	"
256	62202 §	5217	506	"
257	62203 §	5217	506	Hybrid
71-259	62204 §			Sanidine porphyry
261	62205 §	5217	506	Hybrid
262	62206 §	5217	506	Sanidine porphyry-tinguaite
267	62207 §	5217	506	Garnet trachyte
272	62208 §	5217	506	Sanidine porphyry
274	62209 §	5217	506	"
275	62210 §	5217	506	Fine grained sanidine-pyrite
276	62211 §	5217	506	Fine grained sanidine porphyry
277	62212 §	5217	506	Hornfels
278	62213 §	5217	506	Sanidine porphyry
71-280	62214 §	5218	506	"
281	62215 §	5218	506	Leucocratic hybrid
282	62216 §	5217	506	"
284	62217 §	5218	506	"
286	62218 §	5218	506	Sanidine porphyry
287	62219 §	5218	506	Leucocratic hybrid
290	62220 §	5218	506	"
292	62221 §	5218	506	"
294	62222 §	5218	506	"
297	62223 §	5218	506	"
298	62224 §	5218	506	"
71-302	62225 §	5218	506	Melanocratic hybrid
305	62226 §	5218	506	"
307	62227 §	5218	506	Leucocratic hybrid
309	62228 §	5218	506	Melanocratic hybrid
311	62229 §	5218	506	Leucocratic hybrid
314	62230 §	5217	506	Sanidine porphyry
317	62231 §	5217	506	Fine grained sanidine porphyry
318	62232 §	5217	506	Hornfels
71-595	62233 §			Melanocratic hybrid
596	62234 §			Sanidine porphyry-tinguaite
597	62235 §			Leucocratic hybrid

§ thin section cut from Tasmanian Department of Mines specimens.

Appendix 6

MAPS

Five maps or overlays have been included in Appendix 6.

Map 1 is a transparent overlay of the Kingborough sheet (see later) kindly supplied by the Tasmanian Department of Mines. On this, most of the specimen localities have been marked. Thus to identify the specimen with the geological map, the overlay is placed on the map and their coincidence is noted.

For areas of closer sampling along the western shore of Port Cygnet, Maps 2 and 3 are at a larger scale. These cover Regatta Point, the area around Langdons Point and the shoreline south of there. The areas covered by these maps are indicated on Map 1.

The Tasmanian Department of Mines, Kingborough sheet is part of the 1:50,000 series of the Geological Atlas of Tasmania and covers the geology of the Port Cygnet area. This is Map 4 and the 1:500,000 Geological Map of Tasmania is Map 5.