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Mineralogy of the Wooley Creek batholith, slinkard pluton, and related dikes, Klamath Mountains, northern California

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APPENDIX. Petrographic descriptions of analyzed samples of the Wooley Creek batholith, Slinkard pluton, and roof-zone dikes. In Tables 2 through 8, mineral compositions are given in weight percent followed by structural formulae. Cations are normallized to six oxygens for pyroxene, 23 for amphibole, 22 for biotite, four for spinel (magnetite), and eight for feldspars. Temperature estimates in Tables 2 and 3 are from Lindsley's (1983) two-pyroxene geothermometer. Step-wise spot analyses from amphiboles and feldspars are shown by the labels "step in" and "step out" in the tables.

Petrographic Description of Analyzed Samples

Samples are organized according to mode of occurrence and listed by sample number. Sample numbers without a letter prefix have the prefix MMB. Samples with the prefix SL were provided by C.M. Allen (Allen, 1981 and Barnes et al., 1986a).

Wooley Creek Batholith

15 is a pyroxene biotite hornblende quartz diorite with hypidiomorphic granular texture and average grain size about 2mm. Sparse clinopyroxene forms the cores of olive to green hornblende. Ragged biotite books show replacement by chlorite and epidote. Plagioclase shows normal zoning and minor sausuritization. Quartz forms poikilitic patches and microcline is a sparse interstitial phase. Apatite and zircon are accessories.

30 is a biotite pyroxene quartz diorite with hypidiomorphic granular texture. Orthopyroxene is faintly pleochroic (pink to green), shows exsolution of clinopyroxene, and is locally jacketed by clinopyroxene. Orthopyroxene crystals include plagioclase and opaque minerals and show reaction to biotite and rarely to light green amphibole. Clinopyroxene has the same habit, inclusions, and alteration as orthopyroxene and shows exsolution of orthopyroxene. Biotite occurs as ragged, reddish-tan to reddish-brown crystals adjacent to pyroxene crystals. Plagioclase crystals have complexly twinned cores that show patchy and normal zoning, and rims that have few twins and show normal zoning. Pyroxene and apatite occur as inclusions in plagioclase cores and rounded quartz grains are included in plagioclase rims. Quartz occurs as an interstitial phase, zircon is the other accessory phase.

103 is a pyroxene biotite hornblende quartz diorite with hypidiomorphic granular texture and average grain size of 2mm. Rare clinopyroxene forms cores of subhedral hornblende clusters. Hornblende shows tan to olive to green pleochroism, patchy colors, and optically discontinuous cores. Actinolitic amphibole is secondary after hornblende. Locally, clusters of actinolitic amphibole are rimmed by hornblende, an indication of relic pyroxene. Biotite forms clusters of tan to slightly reddish-brown crystals and shows alteration to chlorite. Plagioclase crystals are complexly twinned, have euhedral to subhedral form, show patchy to normal zoning, and occasionally have bent twin lamellae. Quartz and sparse potassium feldspar fill interstices. Apatite and opaque minerals are accessories, epidote, chlorite, sphene, white mica, and hematite are secondary.

111 is similar to 30, but contains interstitial potassium feldspar and interstitial quartz with apatite and rutile (?) needles.

137 is an hypidiomorphic granular biotite hornblende quartz

diorite with average grain size approximately 2.5mm. Olive to tan, euhedral to subhedral hornblende shows seriate distribution to 4mm and has inclusions of opaque minerals, apatite, and plagioclase. Locally, hornblende occurs in crystal clusters. Hornblende and biotite show ambiguous crystallization relationships. Biotite forms ragged tan to brown books as much as 3.5mm in diameter with inclusions of plagioclase, apatite, and zircon. Subhedral plagioclase crystals range from 1mm to 3mm in length and show normal, sector, and oscillitory zoning. Quartz is an interstitial phase.

191 is similar to 137.

194 is similar to 137. Hornblende forms single crystals and crystal clusters. Hornblende crystals > 2mm long in clusters typically show patchy color zoning. This sample contains minor interstitial to poikilitic microcline.

208 is an hypidiomorphic granular biotite hornblende quartz monzodiorite. Average grain size is about 3mm, hornblende crystals reach at least 5mm in length. The mafic minerals are similar to those in 137. Plagioclase forms stubby prisms with oscillatory-normal zoning. Quartz and microcline are poikilitic.

236A is an olivine biotite pyroxene gabbro with hypidiomorphic granular texture and seriate grain size from 0.02mm to 2mm. Olivine forms anhedral grains surrounded by clinopyroxene and sparse orthopyroxene and commonly is altered to intergrown iddingsite and chlorite. Clinopyroxene occurs as euhedral to subhedral prisms and as rims around olivine. A few clinopyroxene-olivine crystal clusters were also observed. Clinopyroxene is optically zoned from core to rim; rims are inclusion-poor whereas cores are rich in plagioclase and opaque inclusions. Plagioclase crystals show oscillatory-normal and patchy zoning and contain inclusions of pyroxene. Potassium feldspar and quartz are interstitial phases. Reddish-brown biotite occurs as a reaction product of clinopyroxene and surrounding accessory ilmenite grains. Apatite is the other accessory.

257 is a glomeroporphyritic pyroxene gabbro with average grain size approximately 3mm. Clinopyroxene and orthopyroxene form glomerocrysts up to 1cm in diameter, with single crystals up to 7mm long. The pyroxenes show mutual exsolution, contain inclusions of opaque minerals, and show minor reaction to light green to light brown amphibole. Plagioclase forms lath-shaped crystals with minor recrystallization to form polygonal aggregates. Chlorite and quartz are accessory phases.

293 is a biotite hornblende quartz diorite with foliated hypidiomorphic granular texture. Average grain size is about 1mm. Foliation is formed by alignment of hornblende, biotite, and

plagioclase. Trace amounts of clinopyroxene form cores of light olive to light green subhedral hornblende crystals as much as 2mm in length. Hornblende also forms aggregates of 0.5mm crystals that reach at least 5mm in diameter. Vermicular quartz is typically included in hornblende crystals and some hornblende shows reaction to biotite. Biotite is slightly reddish-brown to light brown with a slight greenish tint. It occurs as aggregates of 0.5mm to 1mm long flakes that lie in the plane of foliation and are associated with granular titanite. Apatite and zircon are inclusions in biotite. Plagioclase forms stubby prisms as much as 2mm in length. Some plagioclase crystals are bent and a few are broken. Normal zoning is predominant but plagioclase cores show patchy zoning and variable amounts of sericitic alteration. Quartz is interstitial and slightly strained. Locally, quartz shows granulation. Potassium feldspar (interstitial) and opaque minerals are accessories; epidote, chlorite, hematite and tourmaline are secondary.

317 is biotite hornblende quartz monzodiorite with hypidiomorphic granular texture and average grain size of 2.5mm. Olive to tan hornblende occurs as elongate, euhedral prisms up to 5mm long and as clusters of subhedral (1mm diameter) crystals as much as 4mm in maximum dimension. Plagioclase, quartz, apatite, and opaque minerals are inclusions in hornblende. Brown to tan biotite occurs as books up to 3mm in diameter and contains inclusions of quartz, zircon, and hematite (after magnetite?). Plagioclase prisms show oscillatory-normal zoning and are as much as 4mm in length. Quartz commonly forms poikilitic grains, but hexagonal euhedra of quartz enclosed by poikilitic microcline were also observed. Minor chlorite and epidote are the secondary minerals.

351 is an hypidiomorphic granular hornblende pyroxene gabbro. Plagioclase in shows preferred orientation (foliation), is locally slightly bent, and contains clinopyroxene, hornblende, apatite, and opaque inclusions. The sample contains orthopyroxene clusters.

372 is a biotite hornblende granite with average grain size 3mm and hypidiomorphic granular texture. Light to medium olive hornblende occurs as subhedral prisms with inclusions of plagioclase and apatite. Dark to medium brown biotite forms subhedral to ragged books with plagioclase, apatite, and zircon inclusions. Plagioclase prisms are euhedral to subhedral and show oscillatory-normal zoning with slight patchy zoning. Hornblende is included in plagioclase cores. Perthitic potassium feldspar is interstitial to poikilitic, and includes all other phases in the rock. Quartz is interstitial, but locally shows crystal faces against potassium feldspar. Allanite is an accessory phase and chlorite occurs as a secondary mineral.

377 is a medium-grained hypidiomorphic granular hornblende biotite granite. Hornblende forms dark green euhedra and biotite occurs

as dark brown books. Plagioclase occurs as equant crystals to stubby laths with rounded cores and oscillatory-noraml zoned rims. Quartz is typically interstitial but shows euhedral outlines against microcline. Microcline is poikilitic and perthitic. Mafic and accessory minerals are concentrated as inclusions in microcline; accessory minerals include apatite, relict magnetite, zircon, and euhedral titanite.

379 is a biotite hornblende quartz diorite similar to 397 except for the absence of clinopyroxene. Hornblende forms small (<1mm long) euhedra enclosed by quartz and clusters of subhedra that enclose plagioclase and quartz.

397 is a pyroxene biotite hornblende quartz diorite with hypidiomorphic granular texture and average grain size of about 2.5mm. Clinopyroxene occurs as cores of hornblende crystals, shows exsolution of orthopyroxene, and contains opaque mineral inclusions. Medium to light olive hornblende occurs as euhedral prisms up to 7mm in length and as clusters of 2mm-long euhedral to subhedral grains. Plagioclase, opaque minerals, zircon, and apatite are inclusions in hornblende. Biotite forms ragged reddish-brown to dark brown books up to 2mm in diameter. Biotite is typically associated with hornblende as a reaction product. Plagioclase occurs as stubby prisms with oscillatory-normal and patchy zoning. Quartz poikilitically enclases plagioclase and hornblende; microcline occurs interstitially and as small oikocrysts. Apatite, opaque minerals, and zircon are accessory phases; titanite, chlorite, sericite, and epidote are secondary.

471 is an hypidiomorphic granular biotite hornblende granodiorite with average grain size 2mm. Hornblende occurs as equant, euhedral prisms with light to medium brownish-olive pleochroism. Plagioclase, quartz, apatite, and zircon are included in hornblende, which shows minor alteration to chlorite. Biotite forms light to dark brown subhedral to ragged books with inclusions of plagioclase, apatite, zircon, and rare opaque minerals. Plagioclase prisms are euhedral with pronounced oscillatory-normal zoning and inclusions of hornblende and apatite. Perthitic microcline is interstitial to poikilitic and quartz (slightly strained) is interstitial. Epidote and chlorite are secondary minerals.

681Ah is an hypidiomorphic-granular biotite hornblende tonalite (average grain size 2mm) with euhedral, olive-green hornblende, reddish-brown biotite, weakly oscillatory-normal zoned plagioclase, interstitial to poikilitic quartz, and finely perthitic interstitial to poikilitic microcline. Accessory minerals are opaque minerals, stubby apatite (in biotite and hornblende), and acicular apatite (in plagioclase).

687 is an hypidiomorphic-granular (3-4mm) biotite hornblende granodiorite with mineralogy similar to 681Ah, quartz crystals to

5mm with sutured subgrains, and plagioclase with patchy-zoned cores, and oscillatory-normal rims. Accessory minerals are apatite, zircon, and ilmenite.

777B is a medium-grained hypidiomorphic granular biotite hornblende quartz diorite with average grain size of 1mm. Olive to blue-green hornblende contains sparse cores of relcit clinopyroxene as well as inclusions of plagioclase, ilmenite, and relict magnetite. Biotite forms reddish-brown books that are typically intergrown with or rim hornblende. Subhedral plagiolcase has weakly mottled, cracked cores and rims with weak normally-zoned rims. Rare inclusions in plagioclase are hornblende and equant apatite. Alteration minerals are sparse titanite, potassium feldspar, and chlorite.

Cumulate blocks

100 is an allotriomorphic granular olivine pyroxenite with average grain size of approximately 5mm. Olivine forms subhedral to anhedral crystals slightly altered to serpentine and hematite. Olivine shows reaction to clinopyroxene and orthopyroxene. Clinopyroxne and orthopyroxene form euhedral to subhedral crystals with inclusions of opaque mienrals and show reaction to brown amphibole and tremolitic amphibole, respectively. Brown amphibole typically shows rims of green amphibole. Other secondary minerals are green spinel, carbonate, chlorite, epidote, and rare tourmaline.

171 is an amphibole pyroxenite that consists of a framework of clinopyroxene, orthopyroxene, and amphibole with hypidiomorphic granular texture. Clinopyroxene forms equant euhedra that show exsolution of orthopyroxene. Orthopyroxene forms weakly pleochroic, elongate prisms that show exsolution of clinopyroxene parallel to (100) and locally have clinopyroxene rims. Light tan to brown hornblende forms subhedral to poikilitic crystals that enclose all the other phases and show patchy zoning. Tan to reddish-brown pleochroic biotite is commonly associated with brown amphibole. Sparse plagioclase and rare quartz are interstitial phases.

184A is a pyroxene gabbro with hypidiomorphic granular texture. Clinopyroxene forms euhedral to subhedral prisms rimmed by light tan to light green actinolitic hornblende and locally partially replaced by granular amphibole plus biotite. Orthopyroxene has two habits--as prisms similar to clinopyroxene and as clusters of subhedral crystals (after olivine?). Biotite forms tan to reddish-brown anhedral flakes that enclose pyroxene, amphibole, and apatite. Plagioclase forms anhedral, normal to sector zoned crystals that commonly have euhedral cores and include clinopyroxene euhedra. Accessory phases are quartz, chromian spinel, and apatite.

Synplutonic dikes

638 is a coarse- to medium-grained porphyritic pyroxene hornblende diorite with hypidiomorphic granular texture and equant hornblende phenocrysts as much as 2cm in diameter. Average grain size is variable in the outcrop from ~2mm near the dike margins to ~5mm near the core. Salitic clinopyroxene occurs as anhedral, partially replaced crystals enclosed by hornblende and as euhedral to subhedral grains enclosed by interstitial plagioclase. Clinopyroxene enclosed by plagioclase rarely shows appreciable replacement by hornblende. Hornblende is euhedral, poikilitic, and typically shows strong color zonation from medium-brown to olive-brown cores to pale olive outer cores, to pale green rims. All zones enclose clinopyroxene, plagioclase, and sparse iddingsite (after olivine?). Plagioclase and quartz are interstitial and plagioclase poikilitically encloses hornblende and clinopyroxene. Rare relict magnetite is the accessory mineral; chlorite, tremolitic amphibole, and epidote are secondary.

639 is a porphyritic to glomeroporphyritic hornblende microgabbro that is intrusive into 638. Phenocrysts of tan to olive hornblende average 1.5mm long and enclose rare clinopyroxene cores, plagioclase, and biotite. Plagioclase phenocrysts have a sharp core/rim boundary with mottled, cracked calcic cores surrounded by weakly oscillatory-normal zoned rims (with hornblende inclusions). The groundmass is an hypidiomorphic granular arrangement of hornblende, reddish-brown biotite, plagioclase, ilmenite, hematite (after magnetite) and apatite.

771 is a medium-grained hypidiomorphic granular (1mm average grain size) biotite hornblende gabbro with weakly aligned plagioclase and hornblende crystals. Sparse augitic pyroxene forms cores in olive to pale brown, patchy-zoned subhedral hornblende. Hornblende glomerocrysts are rare. Reddish-brown biotite ranges in habit from poikilitic books to thin flakes. Plagioclase is subhedral to interstitial. Large plagioclase crystals have patchy, relatively inclusion-rich cores and oscillatory-normal zoned rims. Accessory minerals include interstitial quartz, ilmenite, and prismatic and acicular apatite. Apatite is included in all other phases but is most common as inclusions in quartz and between interstitial plagioclase grains.

775A is a biotite hornblende gabbro similar to sample 639 (see above) except that 775A contains slightly more clinopyroxene (cores in hornblende that are partly altered to tremolitic amphibole), hornblende phenocrysts are absent, core areas in plagioclase are less resorbed, and apatite (acicular) is more abundant.

776 is a porphyritic hornblende gabbro with euhedral olive hornblende phenocrysts to 7mm long and anhedral, patchy-zoned,

inclusion-rich plagioclase phenocrysts to 7mm long. Groundmass texture ranges from hypidiomorphic to xenomorphic granular and consists of hornblende, plagioclase, and partly chloritized reddish-brown biotite with accessory opaque minerals, titanite, and acicular apatite.

Mafic Microgranitoid Enclaves

681Ae and 681A is a porphyritic biotite hornblende diorite with tan to olive hornblende phenocrysts (1mm) with inclusions of opaque minerals, zircon, plagioclase, and stubby apatite and medium brown biotite oikocrysts with plagioclase, hornblende, and acicular apatite inclusions. Plagioclase phenocrysts have distinct patchy-zoned cores, normally-zoned rims, and hornblende inclusions. Hornblende, biotite flakes, plagioclase, and trace potassium feldspar and quartz make up the fine-grained (0.2mm) idiomorphic groundmass. At the contact (681Ae) with the host, "phenocrysts" and "glomerocrysts" of hornblende, biotite, and quartz to ~3mm diameter are common and are similar in morphology to corresponding host minerals. Groundmass quartz is absent near the contact.

686B is a porphyritic (hornblende and plagioclase to 5mm) biotite hornblende quartz diorite with sparse granular hornblende-biotite glomerocrysts. Brownish-green to olive euhedral to subhedral hornblende shows seriate distribution. Plagioclase phenocrysts show complex twins, oscillatory-normal zoning, inclusion-poor cores surrounded by a hornblende and biotite inclusion-rich zone and an inclusion-poor rim. Goundmass minerals (average 0.5mm diameter) consist of hornblende, anhedral biotite books, equant oscillatory-zoned plagioclase, and slightly strained poikilitic quartz with accessory zircon and hollow, acicular apatite. Minor chlorite, epidote, and titanite are secondary.

686E is a porphyritic (plagioclase and hornblende to 4mm) biotite hornblende quartz diorite. Olive green to olive brown subhedral hornblende phenocrysts have distinct slightly darker cores surrounded by a dusting of ilmenite. Plagioclase phenocrysts commonly show normally-zoned synneusis twins in the core surrounded by a slightly altered dendritic(?) zone with a oscillatory-normal zoned rim. Plagioclase cores contain inclusions of hornblende, biotite, and rare stubby apatite; plagioclase rims have acicular apatite inclusions. The hypidiomorphic granular groundmass (0.5mm) consisits of elongate to stubby hornblende, yellow to reddish-brown biotite books, subhedral to euhedral plagioclase, poikilitic quartz (surrounding plagioclase, hornblende, and acicular apatite), and sparse interstitial potassium feldspar.

766 is a medium-grained biotite hornblende gabbro from the Cuddihy Lake basin. Olive to medium-green hornblende and plagioclase form

phenocrysts and glomerocrysts (average 1mm) up to 3.5mm in maximum dimension. Plagioclase phenocrysts show distinct cores with patchy zoning. The groundmass is a panidiomorphic to hypidiomorphic granular arrangement of hornblende, plagioclase (some poikilitic), and biotite flakes, with accessory opaque minerals, acicular and prismatic apatite, and secondary hematite.

Metasedimentary and metagabbro enclaves

7B is a coarse-grained metagabbro (see text for discussion of possible origin). The primary texture was probably hypidiomorphic granular and consisted of hornblende, plagioclase, and quartz. The primary texture is overprinted by a porphyroblastic texture in which garnet and hornblende porphyroblasts as much as 6 cm in greatest dimension are present in an hypautomorphic granular base. Amphibole occurs as pale yellow-brown to olive ferrotschermakitic hornblende that is rimmed and partly replaced by cummingtonite. Brown biotite is sparse and occurs as interstitial flakes or as a reaction product of hornblende. Garnet is almandine-rich (ave. $\sim py_{16}alm_{62}and_{19}sp_3$), occurs as porphyroblastic dodecahedrons with ragged boundaries and contains inclusions of calcic plagioclase, cummingtonite, hornblende, quartz, biotite, apatite, and ilmenite. Plagioclase in the "groundmass" (1mm in length) shows sharp internal zonation from calcic cores to intermediate reverse-zoned rims, whereas small crystals lack calcic cores. Quartz is interstitial and ilmenite and apatite are accessory phases. Chlorite is a common secondary phase after amphibole and garnet.

119B is a metasedimentary(?) enclave with weak lepidoloblastic to granular texture (average grain size 0.15mm). Sparse 1mm-diameter clinopyroxene crystals are rimmed by hornblende or partly replaced by lamellar hornblende. Olive hornblende is commonly poikiloblastic with inclusions of vermicular quartz; reddish-brown biotite occurs as small flakes. Plagioclase is weakly normally zoned, bent crystals are sparse and pericline twins are common. Interstitial quartz is sparse and ilmenite is the accessary oxide phase.

133 is similar to 179 (see below) except that clinopyroxene also occurs as poikiloblastic grains and pyrrhotite and pyrite are additional accessory phases.

179 is a granoblastic metasedimentary enclave that consists of clinopyroxene, orthopyroxene, hornblende, biotite, plagioclase and sparse interstitial quartz. Average grain size is 0.3mm. Pyroxenes are pale green and contain micron-size opaque inclusions. Interstitial olive hornblende is sparse and reddish-brown biotite is typically poikiloblastic. Both hornblende and biotite also occur along fractures. Plagioclase has patchy-zoned cores and oscillatory-reverse rims. Some plagioclase crystals are bent. Accessory minerals include zircon, and granular apatite.

214B is a metasedimentary enclave with granoblastic texture and shows weak compositional and grain-size layering. Grain size ranges from <0.05 to 4mm and averages 0.2mm. Compositional layers are defined by relative abundance of clinopyroxene and plagioclase (with interstitial quartz). Clinopyroxene is green-brown and weakly pleochroic. Olive to blue-green hornblende is poikiloblastic and rims clinopyroxene and epidote occurs as poikiloblastic grains. Granular plagioclase shows weak reversed zoning. Accessory minerals are apatite, relict magnetite, and rare subhedral zircon.

219A is a strongly layered metasedimentary enclave with biotite-rich lepidoblastic layers and hornblende (+/- cummingtonite)-rich granoblastic layers. Biotite-rich layers consist of brown biotite, intermediate plagioclase with weak normal zoning, and quartz. Hornblende-rich layers consist of olive-brown to blue-green poikiloblastic ferrohornblende, sharply normally-zoned plagioclase with resorbed calcic (An_{85}) cores and intermediate ($\sim An_{50}$) rims, and quartz. Cummingtonite forms large (2-5mm long) crystals that are rimmed and locally replaced by ferrohornblende. Hematite, pyrite, equant subrounded apatite, and rare zircon are accessory minerals.

219B is a compositionally- and grain-sized-layered metasedimentary enclave with granoblastic to poikiloblastic textures and average grain sizes from 0.2 to 1mm. The typical assemblage within compositional layers is clinopyroxene-orthopyroxene-hornblende-plagioclase-biotite-quartz. Variations include the habit of hornblende (poikiloblastic to vermicular), the presence of cummingtonite, and plagioclase composition (from $\sim An_{70}$ to $\sim An_{50}$). Sparse layers of coarse-grained hornblende + clinopyroxene + cummingtonite + epidote (after plagioclase) + quartz are present. Accessory minerals are abundant and include apatite, pyrite, pyrrhotite, ilmenite, relict magnetite, tourmaline, and rare rutile.

219D is a metapelitic enclave with lepidoblastic to granoblastic texture and average grain size 0.2mm. The apparent prograde equilibrium assemblage in this sample is biotite-cordierite-plagioclase-kyanite-quartz-potassium feldspar. Cordierite Fe/(Fe + Mg) = 0.29. Sparse retrograde minerals are muscovite, epidote, chlorite, and hematite. Accessory minerals include zircon (inclusions in quartz), apatite, tourmaline, and pyrrhotite.

Slinkard Pluton

SL-IV is a strongly foliated biotite hornblende quartz diorite. The original texture was protoclastic, hypidiomorphic granular and has been modified by mylonitic deformation (Barnes et al., 1986a). Average grain size is 1.5mm except in thin (<0.5mm) mylonitic zones, in which average grain size is ~0.2mm. Hornblende shows color zoning from olive to tan cores to pale green rims, is

subhedral, is locally broken, and contains inclusions of plagioclase, quartz, zircon, and biotite. Reddish-brown biotite forms bent books that are partly chloritized, especially in mylonitic zones. Plagioclase has sericitized cores and anhedral normally zoned rims. Some crystals are bent. Quartz forms polygonal aggregates that locally show strain. Accessory minerals are apatite and zircon. Secondary minerals include chlorite, epidote, actinolitic amphibole, and rare chalcopyrite: these phases are most abundant in mylonitic zones.

SL86 is a medium-grained weakly foliated biotite hornblende quartz gabbro with hypidiomorphic granular texture that grades into patches of recrystallized(?) xenomorphic granular material (average grain size 2mm). Hornblende has brownish-olive cores and pale olive rims, contains sparse relict clinopyroxene cores, and is typically intergrown with books of reddish-brown biotite. Plagioclase has mottled, resorbed cores and normally-zoned rims and is typically anhedral. Quartz forms interstitial grains and large aggregates of polygonal crystals. Ilmenite, apatite, and zircon are accessory phases.

SL117A is a biotite hornblende tonalite with strong protoclastic foliation imposed on an hypidiomorphic granular texture with average grain size of 1mm. Anhedral hornblende is olive to pale olive: reddish-brown biotite occurs as flakes parallel to the foliation. Plagioclase crystals are subhedral to euhedral, are commonly slightly bent, contain mottled euhedral cores inside oscillatory-normal zoned rims, and contain hornblende and biotite inclusions. Quartz is interstitial and apatite is an accessory mineral.

SL134A is a porphyritic two-pyroxene andesite (microdiorite) dike in the western Slinkard pluton. Phenocrysts average ~0.5mm in diameter and sparse pyroxene glomerocrysts reach 3mm in diameter. The hypidiomorphic granular to xenomorphic granular groundmass is fine-grained (~0.05mm). Pyroxene phenocrysts are euhedra rimmed by dark green hornblende, but pyroxene in glomerocrysts is subhedral. Granule exsolution is sparse. Plagioclase phenocrysts have unzoned cores, oscillatory-normal rims (typically), and contain abundant very fine-grained inclusions of pyroxene and rare relict magnetite. Groundmass phases are brown biotite, hornblende, plagioclase, poikilitic potassium feldspar, and quartz. Apatite and relict magnetite are accessory phases.

264 is similar to 645A (see below).

642A is a two-mica granite with average grain size 0.5mm. Textures range from hypidiomorphic granular to aplitic. Biotite occurs as reddish-brown, ragged flakes that average 0.1mm in diameter and as books that reach 2mm in diameter. Muscovite occurs as ragged books as much as 1mm in diameter and as small (0.1mm) flakes replacing feldspars. Subhedral plagioclase has

euhedral, slightly altered cores and fresh, locally granophyric rims. Quartz is interstitial except where adjacent to interstitial microcline, where quartz shows euhedral crystal faces. Accessory minerals include garnet (~$py_4sp_{29}alm_{64}gr_3$), zircon, apatite, and epidote. Epidote crystals are <0.2mm in diameter and occur as euhedral to subhedral grains with straight boundaries against mica, vermicular contacts with plagioclase and as rare, fine-grained replacement of feldspar.

645A is a protoclastic to hypidiomorphic granular hornblende pyroxene gabbro. Clinopyroxene and orthopyroxene are subhedral, show mutual lamellar (and rare granular) exsolution, and rims of hornblende. Olive to olive-brown hornblende forms rims on pyroxene and is interstitial. Plagioclase is commonly bent, shows weak oscillatory zoning, and albite and pericline twins with wedge terminations. Accessory minerals are biotite, quartz, apatite, and ilmenite.

Roof Zone Dikes

164 is similar to 704 (see below).

548 is a porphyritic microgranodiorite that is mineralogically similar to 697 (see below) and contains phenocrysts of broken to euhedral quartz. Allanite is a rare accessory mineral.

551 is a porphyritic biotite hornblende microgranodiorite with phenocrysts to 6mm long set in a granophyric groundmass. Stubby olive hornblende phenocrysts show weak core to rim zonation from darker to lighter olive and contain inclusions of plagioclase, quartz, opaque minerals and apatite. Relict biotite phenocrysts are 2-3mm in diameter and are altered to a mixture of chlorite, titanite, actinolite, and muscovite. Euhedral to subhedral plagioclase phenocrysts generally show oscillatory-normal zoning, and contain inclusions of apatite, hornblende, and rare zircon. Plagioclase glomerocrysts are common. Quartz phenocrysts are euhedral, commonly broken, and have inclusions of hornblende, biotite, and rare apatite. The groundmass consists of hornblende, plagioclase, potassium feldspar, and quartz.

553 and 554 are similar to 704 (see below) and contain sparse oval clots of quartz +/- actinolitic amphibole +/- biotite in the groundmass.

555 is a porphyritic basalt with sparse olivine phenocrysts and clinopyroxene phenocrysts and glomerocrysts as much as 5mm in diameter. Clinopyroxene phenocrysts contain abundant inclusions of ilmenite, relict magnetite, and plagioclase. The groundmass of the rock is a seriate diabasic to subophitic arrangement of clinopyroxene, orthopyroxene, and plagioclase with interstitial biotite, quartz, K-feldspar, and Fe-Ti oxides.

557 is similar to 704 (see below).

579 is a medium-grained (average 1.5mm) biotite hornblende granodiorite with hypidiomorphic-granular texture. Subhedral pale tan to olive hornblende includes zircon and apatite. Reddish-brown biotite occurs as thin flakes and books. Plagioclase shows seriate distribution, inclusions of apatite and hematite (after magnetite), and both oscillatory-normal and oscillatory-reverse zoning (Figure 18a). Potassium feldspar is poikilitic to interstitial with both stringer and granule exsolution; quartz is interstitial or subhedral adjacent to potassium feldspar. Apatite, zircon, and allanite (with zircon inclusions) are the accessory minerals.

584 is similar to 704, but contains phenocrysts to 4mm long, groundmass with average grain size 0.1mm, and rare secondary calcite.

590 is a sparsely porphyritic (clinopyroxene) basalt with subophitic groundmass (average grain size 0.2mm). The groundmass consists of clinopyroxene and orthopyroxene partly replaced by pale brown poikilitic hornblende and reddish-brown biotite, plagioclase, sparse interstitial quartz, and ilmenite.

693 is a porphyritic pyroxene hornblende andesite with sparse clinopyroxene phenocrysts to ~1mm in diameter and elongate olive to tan, patchy zoned euhedral hornblende phenocrysts that average 1.5mm long. Biotite inclusions are common in hornblende; other phases included in hornblende are opaque minerals, plagioclase, and quartz. Hornblende also occurs as rims around biotite microphenocrysts. Plagioclase phenocrysts are euhedral to subhedral, equant to slightly elongate, and are oscillatory zoned. The groundmass is an intergranular arrangement of hornblende, biotite, plagioclase, quartz, potassium feldspar, and accessory ilmenite and apatite. Biotite typically shows alteration to chlorite.

697 is a biotite hornblende microgranodiorite with seriate hypidiomorphic granular texture and average grain size of 2mm. Prismatic euhedral to subhedral hornblende reaches 5mm in length and is pale olive to tan with darker browish-green cores. Hornblende also occurs in 0.4mm diameter clusters of anhedra (+biotite). Reddish-brown to -yellow biotite forms ragged books that average about 1mm in diameter. Plagioclase phenocrysts show complex twinning, oscillatory zoning, and mild saussuritization, especially in cores. Quartz is typically interstitial to poikilitic, but has subhedral outlines against perthitic, poikilitic microcline. Accessory apatite and zircon occur as inclusions in hornblende and biotite and in the groundmass along with opaque minerals.

699 is similar to 704 (see below) except that glomerocrysts are

elongate (flow-aligned?) and the intergranular groundmass contains minor potassium feldspar.

704 is a porphyritic (seriate) two-pyroxene andesite. Pyroxene phenocrysts (to 5mm diameter) are euhedral to slightly subhedral, glomerocrysts of clinopyroxene +/- plagioclase +/- opaque minerals +/- prismatic apatite are common and rarely contain orthopyroxene. Some orthopyroxene phenocrysts are rimmed by clinopyroxene. Pyroxene contains inclusions of opaque minerals. Fine-grained plagioclase (less than 0.01mm), biotite, amphibole, quartz, ilmenite, and lamellar magnetite make up the groundmass. Euhedral oscillatory-normal zoned plagioclase contains inclusions of clinopyroxene, opaque minerals, and apatite needles.

TABLE 1. Modal analyses in volume percent.

Sample	687	777B	638	639	771	775A	776	681A	686B	686E	766
Plagioclase	42.7	47.7	8.5	43.7	44.1	30.4	30.2	50.2	45.8	53.0	32.9
K-feldspar	4.1	----	----	----	tr	----	tr	tr	1.9	0.5	0.7
Quartz	18.4	5.9	1.5	0.1	1.5	0.6	----	0.2	8.7	10.3	0.5
Clinopyroxene	----	tr	11.0	----	tr	0.1	----	----	----	----	----
Orthopyroxene	----	----	----	----	----	----	----	----	----	----	----
Hornblende	25.1	37.5	73.7	52.6	44.2	64.2	61.0	38.6	37.3	29.2	61.5
Biotite	8.7	8.1	----	3.1	8.4	2.5	8.3	10.5	6.2	6.5	3.7
Cummingtonite	----	----	----	----	----	1.5	----	----	----	----	----
Groundmass	----	----	----	----	----	----	----	----	----	----	----
Opaque min.	0.1	tr	0.1	0.1	0.7	0.2	0.1	0.1	tr	0.2	0.1
Apatite	0.2	0.5	tr	0.4	0.1	0.5	0.4	0.3	0.1	0.3	0.4
Zircon	tr	tr	----	----	----	----	----	----	----	----	----
Allanite	----	----	----	----	----	----	----	----	----	----	----
Titanite					----	----	----	----	----	0.1	----
Epidote	----	----	0.9	----	0.2	----	----	0.1	----	----	----
Chlorite	0.7	0.2	1.0	----	0.8	----	----	0.1	----	----	0.1
Ms/sericite	----	0.1	3.3	----	----	----	----	----	----	----	----
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.1	100.0	100.1	99.9
n	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

TABLE 1. Modal analyses in volume percent, continued.

Sample	119B	133	179	214B	219A	219B	SL-IV	SL86	SL117	SL134	264
Plagioclase	57.9	66.6	52.0	29.1	42.2	31.1	41.9	47.2	54.6	9.4	56.2
K-feldspar	----	----	----	----	----	4.6	----	0.1	0.2	----	----
Quartz	2.7	0.9	1.9	22.1	7.1	15.0	18.2	14.3	25.4	----	0.7
Clinopyroxene	3.7	15.9	35.6	36.2	----	15.0	----	----	----	10.9	20.0
Orthopyroxene	----	10.6	7.3	----	----	3.6	----	----	----	2.0	16.8
Hornblende	29.8	0.6	0.3	1.9	12.9	19.2	24.3	27.2	7.2	----	5.2
Biotite	3.6	2.9	2.5	----	34.3	0.7	11.4	10.9	12.5	0.1	0.1
Cummingtonite	----	----	----	----	3.1	2.2	----	----	----	----	----
Groundmass	----	----	----	----	----	----	----	----	----	77.6	----
Opaque min.	2.3	2.6	0.4	10.6	0.4	8.5	tr	0.1	----	----	0.8
Apatite	----	tr	----	tr	----	0.1	tr	0.1	----	----	----
Zircon	----	----	----	----	----	----	tr	----	----	----	----
Allanite	----	----	----	----	----	----	----	----	----	----	----
Titanite	----	----	----	----	----	----	----	----	0.1	----	----
Epidote	tr	----	----	0.1	----	----	1.2	----	----	----	----
Chlorite	----	----	----	----	----	----	2.8	0.1	----	----	----
Ms/sericite	----	----	----	----	----	----	0.2	----	----	----	----
TOTAL	100.0	100.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8
n	1098	1009	1000	1000	1000	1000	1000	1000	1000	1000	1000

TABLE 1. Modal analyses in volume percent, *continued.*

Sample	642A	645A	164B	548	551	553	554	555*	557	579	584
Plagioclase	42.8	56.2	18.4	33.6	31.3	24.6	29.2	14.7	20.3	34.0	40.4
K-feldspar	37.0	----	----	----	----	----	----	----	----	24.5	----
Quartz	12.6	5.4	----	1.1	8.4	----	----	----	----	32.0	----
Clinopyroxene	----	23.1	8.5	----	----	6.9	9.3	13.7	13.0	----	5.4
Orthopyroxene	----	9.5	7.1	tr	----	6.7	5.4	----	7.5	----	7.0
Hornblende	----	3.1	----	15.1	8.9	----	----	----	----	3.5	----
Biotite	5.2	1.7	----	4.7	2.6	----	----	----	----	6.0	----
Cummingtonite	----	----	----	----	----	----	----	----	----	----	----
Groundmass	----	----	65.9	45.3	48.6	61.8	56.0	71.0	59.2	----	46.9
Opaque min.	----	0.9	0.1	----	----	tr	----	0.5	tr	----	0.3
Apatite	----	0.1	----	tr	tr	----	----	----	----	tr	----
Zircon	----	----	----	----	tr	----	----	----	----	tr	----
Allanite	----	----	----	----	----	----	----	----	----	----	----
Titanite	----	----	----	----	----	----	----	----	----	----	----
Epidote	----	----	----	----	----	----	----	----	----	----	----
Chlorite	----	----	----	----	----	----	----	----	----	----	----
Ms/sericite	2.4	----	----	----	----	----	----	----	----	----	----
TOTAL	100.0	100.0	100.0	99.8	99.8	100.0	99.9	99.9	100.0	100.0	100.0
n	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

TABLE 1. Modal analyses in volume percent, continued.

Sample	590	693	697	699	704
Plagioclase	47.2	9.2	45.5	21.1	27.9
K-feldspar	----	----	12.7	----	----
Quartz	2.5	----	18.7	----	----
Clinopyroxene	6.5	2.8	----	9.7	6.4
Orthopyroxene	13.5	----	----	0.4	7.0
Hornblende	23.5	9.7	15.4	----	----
Biotite	6.5	1.4	7.6	----	----
Cummingtonite	----	----	----	----	----
Groundmass	----	76.9	----	66.9	58.2
Opaque min.	0.3	tr	----	1.8	0.5
Apatite	tr	----	tr	----	----
Zircon	----	----	----	----	----
Allanite	----	----	0.1	----	----
Titanite	----	----	----	----	----
Epidote	----	----	----	----	----
Chlorite	----	----	----	----	----
Ms/sericite	----	----	----	----	----
TOTAL	100.0	100.0	100.0	99.9	100.0
n	1000	1000	1000	1000	1324

TABLE 2.
WCB/SP OPX ave

SPL	XTAL	SiO2	TiO2	Al2O3	MnO	FeO(t)	MgO	CaO	Na2O	Cr2O3	TOTAL
557	opx,av	52.79	0.33	1.14	0.28	21.11	22.61	1.90	0.03	0.05	100.23
164	opx,av	52.74	0.29	1.42	0.39	20.66	23.18	1.82	0.05	0.05	100.60
704	opx,av	53.64	0.22	0.88	0.54	20.12	23.52	1.44	0.02	0.04	100.35
553	opx,av	53.07	0.31	1.10	0.47	21.37	22.78	1.75	0.04	0.13	101.01
584	opx,av	53.97	0.23	0.94	0.48	18.87	24.94	1.49	0.04	0.10	101.05
548	opx,av	51.36	0.09	0.64	1.32	29.92	16.36	0.81	0.01	0.15	100.64
351	opx,av	52.32	0.10	1.00	0.86	26.61	18.55	1.42	0.02	0.06	100.92
264	opx,av	52.45	0.12	1.40	0.50	22.49	21.67	0.74	0.01	0.06	99.43
111	opx,av	50.97	0.25	1.15	0.58	25.01	20.43	1.50	0.06	0.05	99.98
171	opx,av	53.49	0.10	1.38	0.49	19.63	23.32	1.07	0.01	0.02	99.51
100	opx,av	54.54	0.17	2.12	0.22	13.75	27.29	1.70	0.09	0.09	99.96
30	opx,av	51.82	0.29	1.30	0.56	23.53	19.76	1.75	0.07	0.07	99.14
184	opx,av	53.16	0.15	1.43	0.46	18.17	23.95	1.15	0.07	0.09	98.62
257	opx1	53.46	0.23	1.23	0.72	20.08	23.78	0.83	0.03	0.02	100.34
219B	opx,av	50.46	0.05	0.68	0.63	33.49	14.53	0.822	0.01	0.01	100.71
645A	opx,av	51.49	0.07	1.21	0.58	26.40	18.84	1.439	0.03	0.02	100.11
s134	opx,av	53.13	0.20	1.41	0.41	19.86	23.19	1.628	0.02	0.09	99.86
133	opx,av	52.75	0.11	0.88	0.75	24.01	20.99	0.852	0.02	0.02	100.01

SPL	XTAL	Si	Ti	Al	Mn	Fe(t)	Mg	Ca	Na	Cr	TOTAL	T(C)
557	opx,av	1.957	0.008	0.049	0.008	0.654	1.249	0.075	0.002	0.001	4.002	1073
164	opx,av	1.945	0.007	0.061	0.011	0.637	1.273	0.071	0.003	0.001	4.010	1043
704	opx,av	1.973	0.005	0.037	0.016	0.616	1.290	0.056	0.001	.000	3.995	912
553	opx,av	1.955	0.008	0.047	0.014	0.657	1.251	0.068	0.002	0.003	4.005	1037
584	opx,av	1.962	0.006	0.040	0.014	0.574	1.351	0.057	0.002	0.002	4.007	967
548	opx,av	1.983	0.003	0.028	0.043	0.967	0.941	0.033	.000	0.003	4.003	613
351	opx,av	1.977	0.002	0.044	0.027	0.841	1.044	0.056	0.001	0.001	3.992	860
264	opx,av	1.967	0.003	0.061	0.015	0.705	1.211	0.029	.000	0.001	3.992	689
111	opx,av	1.937	0.007	0.052	0.019	0.795	1.158	0.061	0.004	0.002	4.032	950
171	opx,av	1.977	0.003	0.060	0.015	0.607	1.285	0.042	0.001	0.001	3.990	808
100	opx,av	1.955	0.005	0.089	0.007	0.413	1.457	0.065	0.006	0.003	3.998	1100
30	opx,av	1.968	0.008	0.058	0.018	0.747	1.118	0.071	0.005	0.002	3.995	1027
184	opx,av	1.973	0.004	0.062	0.014	0.564	1.324	0.046	0.005	0.003	3.993	825
257	opx1	1.966	0.005	0.053	0.021	0.615	1.303	0.032	0.001	0.000	3.997	700
219B	opx,av	1.974	0.000	0.030	0.020	1.095	0.846	0.033	0.000	0.000	4.001	630
645A	opx,av	1.960	0.001	0.053	0.018	0.840	1.068	0.057	0.001	0.000	4.002	515
s134	opx,av	1.960	0.004	0.060	0.019	0.613	1.274	0.056	0.000	0.002	3.994	880
133	opx,av	1.970	0.002	0.038	0.023	0.755	1.177	0.033	0.001	0.000	4.001	700

TABLE 3. Clinopyroxene

SPL	XTAL	SiO2	TiO2	Al2O3	MnO	FeO(t)	MgO	CaO	Na2O	Cr2O3	TOTAL
557	cpx,av	51.34	0.56	2.09	0.26	11.65	14.17	19.32	0.30	0.06	99.74
164	cpx,av	51.58	0.59	2.02	0.26	11.47	14.62	19.06	0.29	0.06	99.94
704	cpx,av	52.04	0.47	1.70	0.31	9.97	14.94	20.23	0.34	0.08	100.07
555	cpx,av	51.78	0.53	2.71	0.30	9.95	15.30	19.37	0.29	0.09	100.33
553	cpx,av	51.48	0.57	1.98	0.30	12.45	14.32	18.11	0.31	0.06	99.59
590	cpx3r	52.59	0.42	1.89	0.24	9.10	15.20	18.66	0.22	0.25	98.56
584	cpx,av	52.30	0.48	1.95	0.30	9.61	15.08	18.94	0.31	0.16	99.12
699	cpx,av	51.48	0.58	1.60	0.37	13.33	13.66	19.47	0.23	0.11	100.82
693	cpx,av	53.50	0.39	1.93	0.23	6.28	16.38	21.55	0.20	0.26	100.74
264	cpx,av	51.97	0.25	2.15	0.23	8.74	13.71	21.71	0.40	0.07	99.21
397	cpx,av	52.53	0.10	0.83	0.59	9.90	12.78	22.50	0.38	0.06	99.63
111	cpx,av	51.83	0.58	1.98	0.30	10.97	14.25	20.05	0.36	0.09	100.43
171	cpx,av	53.65	0.17	1.50	0.23	7.01	15.26	22.35	0.25	0.42	100.83
100	cpx,av	52.41	0.29	2.42	0.15	6.71	15.66	20.75	0.32	0.25	98.96
236	cpx,av	50.99	0.72	2.84	0.31	12.14	13.85	18.57	0.37	0.07	99.75
30	cpx,av	51.42	0.55	2.10	0.26	10.39	13.67	19.76	0.37	0.11	98.65
184	cpx,av	53.04	0.19	1.68	0.13	6.45	15.74	21.68	0.41	0.43	99.73
103	cpx,av	51.82	0.22	1.05	0.38	9.13	13.67	23.10	0.23	0.00	99.63
257	cpx,av	53.98	0.08	0.56	0.40	7.50	14.47	22.29	0.08	0.05	99.40
219B	cpx,av	51.54	0.07	1.13	0.29	14.91	11.06	21.49	0.25	.00	100.75
645A	cpx,av	51.09	0.25	2.26	0.30	12.02	12.81	20.84	0.38	0.07	100.11
s134	cpx,av	52.09	0.41	2.19	0.26	9.59	15.27	20.40	0.28	0.28	100.77
214B	cpx,av	49.58	0.04	1.40	0.74	18.85	6.76	22.64	0.33	0.04	100.40
179	cpx,av	52.61	0.38	1.31	0.28	9.08	14.65	21.70	0.29	0.08	100.38
133	cpx,av	51.70	0.34	1.72	0.40	10.23	13.84	21.32	0.33	0.04	99.91
SL86	cpx,av	52.84	0.18	1.76	0.32	8.75	14.47	20.30	0.22	0.00	98.89
777B	cpx1av	53.09	0.09	1.11	0.38	8.92	13.34	21.56	0.31	0.00	98.81
638	cpx,av	53.44	0.00	0.57	0.23	5.69	15.39	23.41	0.17	0.00	98.93

TABLE 3. Clinopyroxene, *continued.*

SPL	XTAL	Si	Ti	Al	Mn	Fe(t)	Mg	Ca	Na	Cr	TOTAL	T(C)
557	cpx,av	1.932	0.015	0.092	0.007	0.366	0.794	0.778	0.022	0.001	4.008	1008
164	cpx,av	1.934	0.016	0.089	0.007	0.359	0.817	0.765	0.021	0.001	4.008	1045
704	cpx,av	1.942	0.013	0.074	0.009	0.311	0.830	0.808	0.023	0.002	4.010	985
555	cpx,av	1.921	0.014	0.118	0.008	0.308	0.845	0.769	0.020	0.002	4.007	1086
553	cpx,av	1.941	0.015	0.087	0.009	0.392	0.804	0.731	0.022	0.001	4.003	1074
590	cpx3r	1.971	0.011	0.082	0.006	0.285	0.849	0.749	0.015	0.006	3.975	1120
584	cpx,av	1.957	0.013	0.085	0.009	0.300	0.840	0.759	0.022	0.004	3.989	1073
699	cpx,av	1.936	0.017	0.071	0.012	0.419	0.765	0.785	0.017	0.003	4.022	994
693	cpx,av	1.951	0.010	0.082	0.006	0.191	0.889	0.842	0.014	0.007	3.992	963
264	cpx,av	1.951	0.006	0.094	0.006	0.274	0.767	0.873	0.028	0.001	4.001	838
397	cpx,av	1.982	0.002	0.037	0.018	0.311	0.718	0.909	0.027	0.001	4.003	605
111	cpx,av	1.936	0.016	0.087	0.009	0.343	0.794	0.802	0.026	0.002	4.015	966
171	cpx,av	1.967	0.005	0.064	0.007	0.215	0.834	0.878	0.018	0.012	3.999	853
100	cpx,av	1.948	0.008	0.105	0.005	0.208	0.868	0.826	0.023	0.007	3.999	1023
236	cpx,av	1.918	0.020	0.126	0.010	0.383	0.778	0.749	0.027	0.002	4.012	1054
30	cpx,av	1.949	0.016	0.094	0.008	0.329	0.772	0.802	0.027	0.004	4.001	957
184	cpx,av	1.960	0.005	0.073	0.004	0.202	0.867	0.858	0.029	0.013	4.008	895
103	cpx,av	1.953	0.006	0.046	0.012	0.288	0.769	0.933	0.017	0.000	4.025	---
257	cpx,av	2.007	0.002	0.024	0.012	0.233	0.802	0.888	0.005	0.001	3.972	785
219B	cpx,av	1.960	0.001	0.050	0.009	0.474	0.627	0.875	0.018	0.000	4.025	709
645A	cpx,av	1.929	0.006	0.100	0.009	0.379	0.726	0.842	0.027	0.001	4.018	796
s134	cpx,av	1.927	0.011	0.095	0.007	0.296	0.841	0.808	0.020	0.007	4.012	1031
214B	cpx,av	1.946	0.001	0.064	0.097	0.618	0.395	0.952	0.025	0.001	4.024	---
179	cpx,av	1.955	0.010	0.056	0.007	0.282	0.811	0.864	0.020	0.002	4.007	784
133	cpx,av	1.942	0.009	0.075	0.012	0.321	0.774	0.858	0.024	0.001	4.015	859
SL86	cpx,av	1.979	0.005	0.078	0.010	0.273	0.808	0.815	0.015	0.000	3.980	960
777B	cpx1av	1.999	0.002	0.049	0.011	0.280	0.748	0.870	0.022	0.000	3.981	820
638	cpx,av	1.991	0.000	0.024	0.007	0.177	0.854	0.934	0.012	0.000	3.998	---

Table 4. WCB/SP amphibole.

sample	SiO2	Al2O3	Fe2O3	FeO	MgO	TiO2	Cr2O3	MnO	BaO	CaO	Na2O
548-2, outer core	45.68	8.01	0.00	17.07	11.45	1.65	0.00	0.39	0.00	10.49	1.58
548-2, rim A	49.28	5.09	0.00	17.35	12.22	1.04	0.00	0.41	0.00	10.82	0.84
548-2, rim B	46.65	7.66	0.00	17.90	11.50	1.25	0.00	0.46	0.00	10.37	1.41
548-2, inner rim	45.38	8.42	0.00	17.70	11.39	1.66	0.00	0.41	0.00	10.56	1.73
548, gm hnbl	46.40	7.73	0.00	17.36	11.76	1.02	0.00	0.43	0.00	10.37	1.45
551-1, rim	47.74	6.03	0.00	16.24	12.64	0.66	0.00	0.44	0.00	10.66	1.04
551-1, step in	47.30	6.90	0.00	16.61	12.30	0.78	0.00	0.45	0.00	10.80	1.20
551-1, outer cor	48.64	6.10	0.00	16.03	12.76	0.66	0.00	0.48	0.00	10.53	1.12
551, gm hnbl	47.52	6.68	0.00	16.43	12.48	0.73	0.00	0.44	0.00	10.34	1.17
693-2, rim	46.42	7.74	0.00	16.58	11.83	1.10	0.00	0.42	0.00	9.96	1.34
693-2, core	44.98	8.60	0.00	16.56	11.58	1.71	0.00	0.30	0.00	10.10	1.54
693-3, core	45.67	8.25	0.00	16.27	12.16	1.39	0.00	0.39	0.00	9.85	1.47
693-3, rim	46.06	8.19	0.00	17.01	11.64	1.28	0.00	0.41	0.00	9.53	1.41
579-2, core	49.97	4.35	0.00	18.14	12.30	0.44	0.00	0.52	0.00	10.91	0.71
579-2, rim	50.14	3.97	0.00	17.45	12.70	0.50	0.00	0.52	0.00	11.09	0.75
579-3, core	48.65	5.02	0.00	18.18	11.91	0.61	0.00	0.57	0.00	10.97	0.88
579-3, rim	49.52	4.87	0.00	18.12	11.89	0.51	0.00	0.50	0.00	10.98	0.80
697, gm hnbl	49.21	5.62	0.00	17.64	11.58	0.80	0.00	0.46	0.00	11.56	0.81
697-2, core	47.03	7.48	0.00	16.78	11.88	1.34	0.00	0.45	0.00	11.18	1.22
697-2, rim	49.54	5.09	0.00	17.41	12.39	0.71	0.00	0.49	0.00	11.15	0.92
697-2, step in	46.29	8.47	0.00	17.04	11.50	1.64	0.00	0.41	0.00	11.19	1.49
397-2, rim	45.78	7.88	0.00	16.34	12.04	1.29	0.00	0.38	0.00	11.25	1.32
397-2, core	46.17	7.77	0.00	15.27	12.41	1.57	0.00	0.30	0.00	11.68	1.20
397-2, mid-point	45.86	7.61	0.00	15.84	12.05	1.50	0.00	0.35	0.00	11.49	1.20
351-1, rim	49.11	7.23	0.00	14.79	14.06	0.42	0.00	0.26	0.00	11.24	0.84
351-2, core	48.75	7.45	0.00	14.86	13.87	0.25	0.00	0.25	0.00	11.38	0.79
171-1, core	43.65	10.42	0.00	11.52	13.04	2.31	0.23	0.17	0.00	11.59	1.52
171-1, rim	46.83	8.45	0.00	10.55	14.15	1.65	0.22	0.15	0.00	11.57	1.17
171-2, core	45.09	10.10	0.00	11.51	13.44	1.99	0.14	0.16	0.00	11.43	1.30
184A-1, core	49.22	5.96	0.00	9.10	16.46	0.74	0.31	0.18	0.00	11.34	0.92
184A-1, rim	50.41	5.91	0.00	9.19	16.69	0.56	0.24	0.17	0.00	11.43	0.83
208-2, core	45.98	7.35	0.00	16.37	11.72	1.91	0.05	0.33	0.00	10.53	1.43
208-2, step out	45.34	7.03	0.00	16.12	11.30	1.81	0.07	0.36	0.00	10.70	1.22
208-2, rim	44.48	7.87	0.00	17.06	10.59	1.22	0.04	0.44	0.00	10.87	1.26
372A-1, core	44.77	7.12	0.00	16.38	11.20	1.62	0.02	0.37	0.00	10.65	1.62
372A-1, rim	46.27	6.15	0.00	17.30	11.00	0.86	0.06	0.70	0.00	10.84	1.24
194-2, core	43.62	8.87	0.00	18.43	9.47	1.91	0.06	0.49	0.00	10.61	1.47
194-2, rim	45.76	7.08	0.00	17.66	10.40	1.07	0.03	0.50	0.00	11.01	1.22
103-1, rim, plag	46.97	8.26	0.00	15.42	12.71	0.56	0.00	0.39	0.08	11.68	0.90
103-1, core	46.72	7.81	0.00	15.16	13.06	0.64	0.00	0.38	0.00	11.39	0.92
103-1, rim, qtz	47.30	7.72	0.00	15.39	12.76	0.57	0.00	0.39	0.00	11.16	0.96
379-1, rim, qtz	45.62	7.90	0.00	15.14	13.10	1.09	0.00	0.38	0.08	11.94	1.10
379-1, core	45.56	7.95	0.00	15.04	12.95	1.27	0.00	0.38	0.00	11.27	1.32
379-1, rim, plag	46.10	7.50	0.00	15.08	13.12	0.90	0.00	0.41	0.00	11.52	1.14
317-1, rim, plag	45.42	8.58	0.00	16.90	11.19	1.01	0.00	0.42	0.01	11.44	1.21
317-1, core	45.31	8.84	0.00	17.11	11.54	1.50	0.00	0.38	0.04	10.91	1.58
317-1, step out	45.15	8.49	0.00	16.57	11.81	1.67	0.00	0.37	0.01	10.81	1.63
317-1, step out	44.63	8.71	0.00	16.32	11.68	1.64	0.00	0.37	0.02	11.04	1.58
317-1, rim, Ksp	45.94	7.54	0.00	16.80	11.96	0.73	0.00	0.40	0.15	11.37	1.09
471-1, rim	47.30	6.33	0.00	16.39	12.70	0.69	0.00	0.45	0.00	11.27	0.89
471-1, mid-point	44.94	8.40	0.00	16.62	11.70	1.53	0.00	0.40	0.02	11.29	1.45
471-1, core	45.39	8.18	0.00	15.91	12.39	2.06	0.00	0.31	0.03	10.90	1.68
471-3, rim	44.45	7.99	0.00	17.37	11.24	1.04	0.00	0.46	0.00	11.60	1.23

Table 4. WC3/SP amphibole.

sample	K2O	Cl	F	Total	Si	Al	Fe3+	Fe2+	Mg	Ti
548-2, outer core	0.73	0.00	0.00	97.05	6.868	1.417	0.000	2.145	2.564	0.185
548-2, rim A	0.46	0.00	0.00	97.52	7.316	0.889	0.000	2.152	2.702	0.113
548-2, rim B	0.52	0.00	0.00	97.71	6.985	1.345	0.000	2.234	2.558	0.136
548-2, inner rim	0.64	0.00	0.00	97.90	6.793	1.485	0.000	2.214	2.540	0.184
548, gm hnbl	0.50	0.00	0.00	97.00	6.963	1.305	0.000	2.176	2.629	0.114
551-1, rim	0.45	0.00	0.00	95.90	7.195	1.070	0.000	2.043	2.639	0.070
551-1, step in	0.49	0.00	0.00	96.83	7.081	1.216	0.000	2.078	2.741	0.083
551-1, outer cor	0.40	0.00	0.00	96.71	7.243	1.070	0.000	1.992	2.831	0.070
551, gm hnbl	0.42	0.00	0.00	96.21	7.136	1.181	0.000	2.063	2.794	0.079
693-2, rim	0.46	0.00	0.00	95.85	7.011	1.378	0.000	2.091	2.659	0.124
693-2, core	0.74	0.00	0.00	96.12	6.809	1.532	0.000	2.098	2.612	0.191
693-3, core	0.54	0.00	0.00	95.98	6.886	1.465	0.000	2.049	2.730	0.155
693-3, rim	0.53	0.00	0.00	96.06	6.958	1.453	0.000	2.145	2.619	0.142
579-2, core	0.30	0.00	0.00	97.65	7.418	0.758	0.000	2.248	2.722	0.048
579-2, rim	0.28	0.00	0.00	97.39	7.446	0.652	0.000	2.165	2.810	0.052
579-3, core	0.41	0.00	0.00	97.22	7.292	0.884	0.000	2.278	2.661	0.066
579-3, rim	0.38	0.00	0.00	97.56	7.370	0.851	0.000	2.252	2.637	0.057
697, gm hnbl	0.50	0.00	0.00	98.18	7.279	0.977	0.000	2.179	2.552	0.086
697-2, core	0.51	0.00	0.00	97.87	6.985	1.308	0.000	2.084	2.629	0.148
697-2, rim	0.35	0.00	0.00	98.04	7.319	0.884	0.000	2.150	2.728	0.078
697-2, step in	0.63	0.00	0.00	98.66	6.839	1.475	0.000	2.104	2.533	0.182
397-2, rim	0.84	0.00	0.00	97.11	6.876	1.393	0.000	2.049	2.693	0.141
397-2, core	0.73	0.00	0.00	97.11	6.888	1.366	0.000	1.905	2.759	0.175
397-2, mid-point	0.78	0.00	0.00	96.68	6.895	1.345	0.000	1.989	2.699	0.167
351-1, rim	0.30	0.00	0.00	98.25	7.136	1.237	0.000	1.795	3.045	0.042
351-2, core	0.36	0.00	0.00	97.95	7.111	1.280	0.000	1.811	3.014	0.025
171-1, core	1.01	0.00	0.00	95.46	6.552	1.844	0.000	1.446	2.919	0.261
171-1, rim	0.70	0.00	0.00	95.44	6.933	1.474	0.000	1.305	3.123	0.184
171-2, core	1.02	0.00	0.00	96.17	6.685	1.764	0.000	1.426	2.970	0.222
184A-1, core	0.57	0.00	0.00	94.79	7.249	1.035	0.000	1.120	3.614	0.082
184A-1, rim	0.47	0.00	0.00	95.90	7.317	1.011	0.000	1.116	3.612	0.061
208-2, core	0.64	0.00	0.00	96.30	6.939	1.307	0.000	2.066	2.637	0.217
208-2, step out	0.62	0.00	0.00	94.57	6.971	1.274	0.000	2.073	2.590	0.210
208-2, rim	0.56	0.00	0.00	94.40	6.893	1.437	0.000	2.211	2.447	0.143
372A-1, core	0.53	0.00	0.00	94.27	6.929	1.298	0.000	2.120	2.585	0.188
372A-1, rim	0.45	0.00	0.00	94.87	7.126	1.116	0.000	2.228	2.526	0.099
194-2, core	0.77	0.00	0.00	95.70	6.729	1.613	0.000	2.377	2.178	0.221
194-2, rim	0.45	0.00	0.00	95.17	7.033	1.282	0.000	2.270	2.383	0.124
103-1, rim, plag	0.52	0.05	0.12	97.60	6.956	1.442	0.000	1.909	2.805	0.062
103-1, core	0.55	0.05	0.08	96.72	6.972	1.374	0.000	1.892	2.905	0.072
103-1, rim, qtz	0.55	0.03	0.00	96.82	7.038	1.355	0.000	1.915	2.830	0.064
379-1, rim, qtz	0.62	0.05	0.17	97.11	6.829	1.394	0.000	1.895	2.923	0.123
379-1, core	0.59	0.09	0.12	96.47	6.848	1.409	0.000	1.891	2.901	0.144
379-1, rim, plag	0.60	0.03	0.13	96.55	6.916	1.341	0.000	1.892	2.934	0.102
317-1, rim, plag	0.80	0.05	0.11	97.08	6.844	1.524	0.000	2.130	2.513	0.114
317-1, core	0.73	0.11	0.15	99.11	6.765	1.556	0.000	2.136	2.568	0.168
317-1, step out	0.71	0.00	0.15	97.31	6.778	1.502	0.000	2.080	2.642	0.189
317-1, step out	0.70	0.08	0.09	96.80	6.739	1.551	0.000	2.061	2.629	0.186
317-1, rim, Ksp	0.78	0.00	0.00	96.76	6.937	1.342	0.000	2.122	2.691	0.083
471-1, rim	0.62	0.11	0.17	96.82	7.102	1.121	0.000	2.058	2.842	0.078
471-1, mid-point	0.71	0.00	0.10	97.12	6.770	1.492	0.000	2.094	2.627	0.173
471-1, core	0.76	0.03	0.30	97.81	6.771	1.439	0.000	1.925	2.755	0.231
471-3, rim	0.77	0.02	0.12	96.24	6.799	1.440	0.000	2.222	2.568	0.120

Table 4. WCB/SP amphibole.

sample	Cr	Mn	Ca	Na	K	TOTAL	Cl	F
548-2, outer core	0.000	0.048	1.690	0.459	0.137	15.513		
548-2, rim A	0.000	0.048	1.721	0.239	0.083	15.263		
548-2, rim B	0.000	0.057	1.656	0.407	0.096	15.454		
548-2, inner rim	0.000	0.048	1.691	0.500	0.123	15.579		
548, gm hnbl	0.000	0.053	1.665	0.418	0.092	15.476		
551-1, rim	0.000	0.053	1.720	0.300	0.084	15.374		
551-1, step in	0.000	0.052	1.730	0.347	0.092	15.419		
551-1, outer cor	0.000	0.057	1.677	0.319	0.074	15.332		
551, gm hnbl	0.000	0.053	1.662	0.339	0.079	15.386		
693-2, rim	0.000	0.053	1.608	0.390	0.088	15.402		
693-2, core	0.000	0.035	1.634	0.448	0.142	15.496		
693-3, core	0.000	0.048	1.588	0.429	0.102	15.453		
693-3, rim	0.000	0.048	1.538	0.407	0.102	15.410		
579-2, core	0.000	0.065	1.733	0.205	0.056	15.252		
579-2, rim	0.000	0.065	1.760	0.213	0.052	15.256		
579-3, core	0.000	0.070	1.759	0.255	0.079	15.345		
579-3, rim	0.000	0.061	1.750	0.227	0.070	15.274		
697, gm hnbl	0.000	0.056	1.832	0.230	0.091	15.281		
697-2, core	0.000	0.052	1.779	0.349	0.096	15.429		
697-2, rim	0.000	0.051	1.765	0.260	0.065	15.309		
697-2, step in	0.000	0.047	1.770	0.425	0.117	15.491		
397-2, rim	0.000	0.044	1.807	0.383	0.158	15.544		
397-2, core	0.000	0.035	1.865	0.346	0.136	15.474		
397-2, mid-point	0.000	0.044	1.848	0.348	0.146	15.481		
351-1, rim	0.000	0.030	1.749	0.234	0.055	15.324		
351-2, core	0.000	0.030	1.776	0.222	0.064	15.333		
171-1, core	0.027	0.022	1.864	0.442	0.193	15.569		
171-1, rim	0.026	0.018	1.835	0.337	0.133	15.368		
171-2, core	0.017	0.020	1.816	0.374	0.192	15.485		
184A-1, core	0.036	0.023	1.789	0.262	0.106	15.317		
184A-1, rim	0.027	0.021	1.777	0.233	0.087	15.263		
208-2, core	0.006	0.043	1.703	0.418	0.122	15.458		
208-2, step out	0.008	0.046	2.590	0.365	0.122	15.422		
208-2, rim	0.005	0.057	1.804	0.380	0.112	15.489		
372A-1, core	0.003	0.048	1.767	0.486	0.104	15.527		
372A-1, rim	0.007	0.091	1.789	0.370	0.089	15.442		
194-2, core	0.007	0.064	2.178	0.440	0.151	15.535		
194-2, rim	0.004	0.065	1.813	0.353	0.080	15.425		
103-1, rim, plag	0.000	0.049	1.854	0.258	0.098	15.433	0.013	0.056
103-1, core	0.000	0.048	1.822	0.266	0.105	15.456	0.013	0.038
103-1, rim, qtz	0.000	0.049	1.779	0.277	0.104	15.411	0.008	0.000
379-1, rim, qtz	0.000	0.048	1.915	0.319	0.118	15.564	0.013	0.080
379-1, core	0.000	0.048	1.815	0.385	0.113	15.554	0.023	0.057
379-1, rim, plag	0.000	0.052	1.851	0.332	0.115	15.535	0.008	0.062
317-1, rim, plag	0.000	0.054	1.847	0.354	0.154	15.534	0.013	0.052
317-1, core	0.000	0.048	1.745	0.457	0.139	15.582	0.028	0.071
317-1, step out	0.000	0.047	1.739	0.474	0.136	15.587	0.000	0.071
317-1, step out	0.000	0.047	1.786	0.463	0.138	15.597	0.020	0.043
317-1, rim, Ksp	0.000	0.051	1.840	0.319	0.150	15.535	0.000	0.000
471-1, rim	0.000	0.057	1.813	0.259	0.119	15.449	0.028	0.081
471-1, mid-point	0.000	0.051	1.822	0.424	0.136	15.589	0.000	0.048
471-1, core	0.000	0.039	1.742	0.485	0.145	15.592	0.008	0.142
471-3, rim	0.000	0.060	1.901	0.365	0.150	15.619	0.005	0.000

Table 4. WCB/SP amphibole.

sample	SiO2	Al2O3	Fe2O3	FeO	MgO	TiO2	Cr2O3	MnO	BaO	CaO	Na2O
471-3, core	44.05	8.56	0.00	17.03	11.50	1.62	0.00	0.44	0.04	10.61	1.67
471-3, rim, plag	46.22	7.62	0.00	17.23	12.25	0.81	0.00	0.45	0.00	11.04	1.29
SL117-1, core	51.88	5.10	0.00	13.12	14.90	0.21	0.00	0.32	0.00	12.32	0.53
SL117-1, rim	51.93	4.31	0.00	12.70	15.31	0.21	0.00	0.32	0.00	12.31	0.46
SL117-2, core	51.63	4.87	0.00	12.66	15.13	0.32	0.00	0.33	0.00	12.50	0.45
SL117-2, rim	51.63	4.90	0.00	12.48	15.15	0.10	0.00	0.30	0.00	12.32	0.43
SL86-2, core	47.55	8.89	0.00	13.80	13.09	1.48	0.00	0.33	0.00	11.41	0.90
SL86-2, mid-poin	47.78	8.97	0.00	13.86	12.95	1.50	0.00	0.32	0.00	11.27	0.87
SL86-2, rim	46.83	9.04	0.00	13.94	13.08	1.63	0.00	0.29	0.00	11.46	0.97
775-1, rim, qtz	47.25	8.34	0.00	13.96	13.38	1.52	0.00	0.27	0.00	10.84	1.21
775-1, core	46.21	9.18	0.00	14.25	13.07	1.53	0.00	0.20	0.00	10.88	1.40
775-1, near rim	46.45	9.00	0.00	14.04	13.21	1.38	0.00	0.17	0.00	10.66	1.26
775-1, outer cor	46.00	9.40	0.00	13.93	13.31	1.37	0.00	0.24	0.00	11.16	1.33
776-2, rim	46.16	9.27	0.00	14.83	12.84	1.25	0.00	0.29	0.00	11.00	1.28
776-2, mid-point	47.77	8.01	0.00	14.43	13.71	1.12	0.00	0.31	0.00	10.47	1.13
776-2, core	46.76	8.55	0.00	14.84	13.26	1.16	0.00	0.33	0.00	10.41	1.17
776-2, core B	47.14	8.79	0.00	14.80	13.14	1.06	0.00	0.03	0.00	10.37	1.14
777B-1, rim	46.37	8.68	0.00	16.39	12.36	0.70	0.00	0.39	0.00	10.96	1.11
777B-1, step in	45.37	8.77	0.00	16.54	12.05	1.60	0.00	0.30	0.00	10.61	1.24
777B-1, step in	44.63	8.83	0.00	16.14	12.05	1.95	0.00	0.34	0.00	10.86	1.30
777B-1, core	45.72	8.96	0.00	15.77	12.02	1.75	0.00	0.23	0.00	11.18	1.13
293-1, rim	49.82	6.09	0.00	13.57	13.77	0.24	0.00	0.33	0.00	12.38	0.60
293-1, core	45.77	8.95	0.00	14.82	11.77	1.48	0.00	0.34	0.00	12.12	1.02
293-1, step out	46.08	9.02	0.00	14.89	11.79	1.59	0.00	0.39	0.00	12.21	1.01
293-3, rim	51.11	4.93	0.00	13.69	14.23	0.11	0.00	0.35	0.00	12.48	0.48
293-3, core	46.91	7.92	0.00	14.82	12.31	1.13	0.00	0.36	0.00	11.96	0.80
638-1, rim	50.95	5.14	0.00	9.21	17.29	0.55	0.00	0.20	0.00	12.04	0.77
638-1, step in	50.95	5.88	0.00	9.45	17.14	0.24	0.00	0.25	0.00	11.86	0.89
638-1, step in	51.78	5.77	0.00	9.22	17.23	0.08	0.00	0.18	0.00	11.71	0.85
638-1, step in	46.93	10.59	0.00	10.32	14.91	0.44	0.00	0.20	0.00	11.59	1.44
638-1, step in	46.85	10.71	0.00	10.08	14.74	0.95	0.00	0.15	0.00	11.56	1.41
638-1, step in	45.66	10.81	0.00	10.05	14.98	1.19	0.00	0.18	0.00	11.70	1.54
638-1, core	47.46	9.51	0.00	9.41	15.90	1.16	0.00	0.20	0.00	11.79	1.48
638-2, core	43.22	11.91	0.00	8.95	15.17	2.09	0.00	0.08	0.00	12.10	2.00
638-2, rim	52.55	3.80	0.00	9.20	17.73	0.26	0.00	0.21	0.00	11.94	0.52
639 gm, rim	46.00	9.00	0.00	14.21	12.36	1.60	0.00	0.26	0.00	12.06	1.27
639-1, rim	45.76	8.49	0.00	14.21	12.72	1.62	0.00	0.23	0.00	12.29	1.14
639-1, step in	45.81	8.79	0.00	14.79	12.25	1.30	0.00	0.28	0.00	12.21	1.29
639-1, step in	45.60	9.14	0.00	14.86	12.23	1.83	0.00	0.25	0.00	11.90	1.35
639-1, core	47.07	7.86	0.00	14.64	12.00	1.36	0.00	0.29	0.00	11.99	1.15
681A-1, rim	45.81	8.87	0.00	17.35	11.42	0.77	0.00	0.38	0.00	11.48	1.09
681A-1, step in	45.95	8.37	0.00	17.09	11.56	1.24	0.00	0.37	0.00	11.10	1.38
681A-1, core	46.16	8.27	0.00	17.06	11.27	1.38	0.00	0.41	0.00	11.16	1.23
681A-8, core	44.88	9.16	0.00	17.25	11.06	1.61	0.00	0.35	0.00	10.17	1.56
681A-8, step out	45.42	8.45	0.00	17.46	11.19	1.31	0.00	0.45	0.00	10.27	1.52
681A-8, rim	45.81	8.27	0.00	17.58	11.59	0.74	0.00	0.33	0.00	11.30	1.30
681A gm1, core	45.21	9.11	0.00	17.48	10.88	1.02	0.00	0.42	0.00	11.39	1.09
681A gm2, core	45.59	8.38	0.00	17.43	11.27	1.07	0.00	0.43	0.00	11.16	1.27
681B-4, rim	45.40	8.61	0.00	17.07	11.16	1.04	0.00	0.38	0.00	11.08	1.21
681B-4, step in	45.86	8.28	0.00	17.09	11.52	1.18	0.00	0.41	0.00	10.57	1.39
681B-4, core	45.66	8.33	0.00	17.24	11.45	1.64	0.00	0.47	0.00	10.14	1.45
686B-1, core	45.49	8.36	0.00	17.27	11.18	1.70	0.00	0.44	0.00	11.65	1.48
686B-1, step out	45.92	8.13	0.00	17.01	11.64	1.61	0.00	0.40	0.00	11.60	1.51

Table 4. WCB/SP amphibole.

sample	K2O	Cl	F	Total	Si	Al	Fe3+	Fe2+	Mg	Ti
471-3, core	0.71	0.08	2.14	96.37	6.715	1.538	0.000	2.171	2.613	0.186
471-3, rim, plag	0.63	0.06	0.00	97.60	6.918	1.344	0.000	2.157	2.732	0.091
SL117-1, core	0.34	0.00	0.00	98.70	7.434	0.857	0.000	1.568	3.183	0.021
SL117-1, rim	0.25	0.00	0.00	97.80	7.493	0.732	0.000	1.532	3.289	0.021
SL117-2, core	0.30	0.00	0.00	98.18	7.430	0.823	0.000	1.521	3.244	0.034
SL117-2, rim	0.43	0.00	0.00	97.75	7.457	0.831	0.000	1.525	3.260	0.000
SL86-2, core	0.43	0.00	0.00	97.89	6.932	1.523	0.000	1.682	2.845	0.158
SL86-2, mid-point	0.53	0.00	0.00	97.86	6.957	1.538	0.000	1.882	2.808	0.162
SL86-2, rim	0.53	0.00	0.00	97.74	6.857	1.560	0.000	1.706	2.853	0.176
775-1, rim, qtz	0.53	0.00	0.00	97.30	6.942	1.444	0.000	1.711	2.928	0.164
775-1, core	0.61	0.00	0.00	97.33	6.813	1.592	0.000	1.756	2.872	0.168
775-1, near rim	0.54	0.00	0.00	95.73	6.866	1.565	0.000	1.735	2.910	0.151
775-1, outer cor	0.55	0.00	0.00	97.30	6.776	1.630	0.000	1.716	2.923	0.151
776-2, rim	0.53	0.00	0.00	97.46	6.816	1.612	0.000	1.828	2.825	0.138
776-2, mid-point	0.40	0.00	0.00	97.36	7.013	1.383	0.000	1.771	2.998	0.121
776-2, core	0.44	0.00	0.00	96.92	6.914	1.489	0.000	1.832	2.921	0.125
776-2, core B	0.43	0.00	0.00	97.23	6.942	1.521	0.000	1.819	2.883	0.117
777B-1, rim	0.45	0.00	0.00	97.39	6.892	1.518	0.000	2.037	2.735	0.074
777B-1, step in	0.70	0.00	0.00	97.18	6.791	1.546	0.000	2.069	2.688	0.175
777B-1, step in	0.73	0.00	0.00	96.82	6.712	1.562	0.000	2.025	2.701	0.220
777B-1, core	0.73	0.00	0.00	97.50	6.798	1.571	0.000	1.959	2.662	0.192
293-1, rim	0.46	0.00	0.00	97.27	7.297	1.048	0.000	1.659	3.004	0.025
293-1, core	0.75	0.00	0.00	97.02	6.824	1.570	0.000	1.846	2.616	0.162
293-1, step out	0.72	0.00	0.00	97.69	6.823	1.573	0.000	1.843	2.599	0.174
293-3, rim	0.23	0.00	0.00	97.61	7.438	0.841	0.000	1.665	2.857	0.008
293-3, core	0.55	0.00	0.00	96.77	6.979	1.388	0.000	1.842	2.728	0.126
638-1, rim	0.37	0.00	0.00	96.52	7.355	0.873	0.000	1.110	3.720	0.059
638-1, step in	0.30	0.00	0.00	96.96	7.319	0.995	0.000	1.134	3.668	0.025
638-1, step in	0.22	0.00	0.00	97.04	7.396	0.968	0.000	1.098	3.666	0.008
638-1, step in	0.70	0.00	0.00	97.12	6.801	1.808	0.000	1.250	3.220	0.046
638-1, step in	0.79	0.00	0.00	96.44	6.734	1.845	0.000	1.231	3.210	0.103
638-1, step in	0.52	0.00	0.00	96.61	6.868	1.860	0.000	1.226	3.261	0.128
638-1, core	0.46	0.00	0.00	97.36	6.836	1.611	0.000	1.133	3.412	0.123
638-2, core	0.57	0.00	0.00	96.08	6.369	2.067	0.000	1.098	3.339	0.229
638-2, rim	0.20	0.00	0.00	96.42	7.560	0.641	0.000	1.105	2.799	0.025
639 gm, rim	0.73	0.00	0.00	97.49	6.803	1.566	0.000	1.752	2.720	0.178
639-1, rim	0.64	0.00	0.00	97.11	6.800	1.487	0.000	1.762	2.817	0.179
639-1, step in	0.67	0.00	0.00	97.39	6.801	1.538	0.000	1.834	2.710	0.144
639-1, step in	0.80	0.00	0.00	97.96	6.741	1.592	0.000	1.835	2.694	0.199
639-1, core	0.61	0.00	0.00	97.77	6.943	1.329	0.000	1.805	2.857	0.147
681A-1, rim	0.73	0.00	0.00	97.90	6.833	1.558	0.000	2.162	2.539	0.083
681A-1, step in	0.55	0.00	0.00	97.71	6.856	1.471	0.000	2.132	2.592	0.135
681A-1, core	0.63	0.00	0.00	97.55	6.890	1.454	0.000	2.128	2.505	0.153
681A-8, core	0.58	0.00	0.00	96.64	6.767	1.628	0.000	2.173	2.482	0.181
681A-8, step out	0.60	0.00	0.00	96.68	6.856	1.501	0.000	2.201	2.516	0.146
681A-8, rim	0.65	0.00	0.00	97.58	6.861	1.459	0.000	2.202	2.588	0.083
681A gm1, core	0.86	0.00	0.00	97.45	6.793	1.610	0.000	2.196	2.435	0.114
681A gm2, core	0.56	0.00	0.00	97.15	6.855	1.483	0.000	2.189	2.565	0.119
681B-4, rim	0.66	0.00	0.00	96.63	6.857	1.533	0.000	2.154	2.513	0.115
681B-4, step in	0.53	0.00	0.00	95.82	6.892	1.464	0.000	2.147	2.579	0.132
681B-4, core	0.67	0.00	0.00	97.04	6.858	1.472	0.000	2.164	2.561	0.181
686B-1, core	0.29	0.00	0.00	97.87	6.797	1.469	0.000	2.157	2.486	0.188
686B-1, step out	0.54	0.00	0.00	98.36	6.818	1.420	0.000	2.108	2.575	0.176

Table 4. WCB/SP amphibole.

sample	Cr	Mn	Ca	Na	K	TOTAL	Cl	F
471-3, core	0.000	0.057	1.733	0.494	0.138	15.645	0.021	0.067
471-3, rim, plag	0.000	0.058	1.770	0.374	0.120	15.564	0.015	0.058
SL117-1, core	0.000	0.038	1.888	0.143	0.059	15.189		
SL117-1, rim	0.000	0.038	1.900	0.127	0.042	15.174		
SL117-2, core	0.000	0.038	1.926	0.122	0.050	15.187		
SL117-2, rim	0.000	0.034	1.908	0.119	0.076	15.197		
SL86-2, core	0.000	0.038	1.780	0.252	0.077	15.287		
SL86-2, mid-point	0.000	0.038	1.756	0.243	0.094	15.258		
SL86-2, rim	0.000	0.034	1.796	0.275	0.094	15.350		
775-1, rim, qtz	0.000	0.030	1.703	0.340	0.099	15.361		
775-1, core	0.000	0.021	1.717	0.398	0.112	15.450		
775-1, near rim	0.000	0.017	1.687	0.360	0.100	15.391		
775-1, outer cor	0.000	0.026	1.760	0.380	0.099	15.461		
776-2, rim	0.000	0.034	1.737	0.364	0.100	15.454		
776-2, mid-point	0.000	0.034	1.646	0.318	0.073	15.356		
776-2, core	0.000	0.039	1.649	0.334	0.082	15.385		
776-2, core B	0.000	0.039	1.634	0.324	0.078	15.356		
777B-1, rim	0.000	0.048	1.745	0.318	0.083	15.448		
777B-1, step in	0.000	0.035	1.700	0.355	0.131	15.490		
777B-1, step in	0.000	0.040	1.747	0.375	0.137	15.519		
777B-1, core	0.000	0.026	1.780	0.323	0.135	15.445		
293-1, rim	0.000	0.039	1.942	0.167	0.082	15.263		
293-1, core	0.000	0.039	1.933	0.293	0.140	15.422		
293-1, step out	0.000	0.047	1.934	0.287	0.134	15.414		
293-3, rim	0.000	0.042	1.943	0.132	0.038	15.196		
293-3, core	0.000	0.043	1.903	0.227	0.100	15.336		
638-1, rim	0.000	0.021	1.860	0.211	0.063	15.273		
638-1, step in	0.000	0.029	1.821	0.249	0.055	15.294		
638-1, step in	0.000	0.021	1.789	0.234	0.038	15.217		
638-1, step in	0.000	0.021	1.799	0.399	0.127	15.473		
638-1, step in	0.000	0.017	1.811	0.399	0.146	15.496		
638-1, step in	0.000	0.021	1.830	0.433	0.094	15.520		
638-1, core	0.000	0.021	1.818	0.410	0.084	15.447		
638-2, core	0.000	0.008	1.907	0.566	0.104	15.677		
638-2, rim	0.000	0.021	1.840	0.143	0.034	15.168		
639 gm, rim	0.000	0.030	1.909	0.360	0.134	15.453		
639-1, rim	0.000	0.026	1.954	0.327	0.118	15.469		
639-1, step in	0.000	0.035	1.943	0.370	0.126	15.500		
639-1, step in	0.000	0.030	1.882	0.386	0.147	15.507		
639-1, core	0.000	0.034	1.892	0.324	0.112	15.443		
681A-1, rim	0.000	0.043	1.834	0.315	0.135	15.502		
681A-1, step in	0.000	0.043	1.773	0.394	0.105	15.501		
681A-1, core	0.000	0.048	1.782	0.354	0.118	15.433		
681A-8, core	0.000	0.044	1.642	0.456	0.110	15.483		
681A-8, step out	0.000	0.057	1.661	0.443	0.115	15.495		
681A-8, rim	0.000	0.040	1.811	0.374	0.123	15.540		
681A gm1, core	0.000	0.053	1.831	0.317	0.163	15.512		
681A gm2, core	0.000	0.053	1.795	0.366	0.105	15.493		
681B-4, rim	0.000	0.044	1.791	0.354	0.124	15.485		
681B-4, step in	0.000	0.048	1.702	0.401	0.101	15.465		
681B-4, core	0.000	0.057	1.631	0.418	0.127	15.470		
686B-1, core	0.000	0.052	1.863	0.425	0.052	15.491		
686B-1, step out	0.000	0.048	1.843	0.431	0.100	15.521		

Table 4. WCB/SP amphibole.

sample	SiO2	Al2O3	Fe2O3	FeO	MgO	TiO2	Cr2O3	MnO	BaO	CaO	Na2O
686B-1, rim	46.31	7.69	0.00	16.51	12.00	1.26	0.00	0.48	0.00	12.07	1.30
686B-1, inner ri	45.87	8.39	0.00	16.90	11.48	1.76	0.00	0.41	0.00	11.59	1.52
686E-3, rim	43.91	9.62	0.00	17.43	10.95	1.77	0.00	0.34	0.00	12.26	1.38
686E-3, step in	45.97	8.36	0.00	16.28	12.48	1.57	0.00	0.33	0.00	11.18	1.53
686E-3, core A	45.87	8.25	0.00	16.04	12.40	1.86	0.00	0.30	0.00	11.43	1.54
686E-3, core B	45.93	7.80	0.00	16.50	12.47	1.72	0.00	0.37	0.00	11.38	1.43
686E-3, step out	45.91	8.18	0.00	16.30	12.27	1.68	0.00	0.38	0.00	11.63	1.48
686E-3, rim	46.30	7.77	0.00	16.31	12.43	1.40	0.00	0.43	0.00	12.14	1.25
687-3, core	45.05	8.33	0.00	17.08	11.53	1.51	0.00	0.45	0.00	11.22	1.59
687-3, step out	45.56	8.02	0.00	17.16	11.24	1.48	0.00	0.39	0.00	11.32	1.50
687-3, rim	46.08	7.77	0.00	16.86	11.44	0.94	0.00	0.41	0.00	11.95	1.16
687 gm 1, ave.	45.72	7.98	0.00	17.09	11.21	0.70	0.00	0.41	0.00	11.93	1.22
687 gm 2, ave.	45.53	8.00	0.00	17.00	11.30	1.13	0.00	0.41	0.00	11.94	1.20
771 gm 1, ave.	44.82	10.11	0.00	16.39	11.21	1.34	0.00	0.30	0.00	11.67	1.25
771 gm 2, ave.	44.86	9.81	0.00	16.68	11.50	1.38	0.00	0.38	0.00	11.13	1.25
771-3, core	45.78	9.25	0.00	16.66	11.68	1.48	0.00	0.34	0.00	11.15	1.12
771-3, step out	44.17	10.19	0.00	16.80	11.09	2.05	0.00	0.33	0.00	11.39	1.27
771-3, step out	45.48	9.42	0.00	16.58	11.73	1.44	0.00	0.36	0.00	11.04	1.18
771-3, step out	46.38	8.45	0.00	16.54	12.22	1.58	0.00	0.38	0.00	10.89	1.11
771-3, rim	46.94	8.57	0.00	16.01	12.23	1.15	0.00	0.43	0.00	11.12	1.05
SL-IV-2, rim	48.30	7.39	0.00	12.55	13.93	0.33	0.00	0.33	0.00	12.42	0.76
SL-IV-2, mid-poin	46.81	8.75	0.00	13.34	13.03	0.78	0.00	0.38	0.00	12.13	0.53
SL-IV-2, core	46.53	9.81	0.00	13.87	12.84	0.74	0.00	0.36	0.00	11.82	1.05
645-1, ave.	42.88	12.01	0.00	15.64	10.73	2.14	0.00	0.15	0.00	11.89	1.26
645-4, ave.	43.54	11.35	0.00	15.57	10.98	1.83	0.00	0.16	0.00	11.86	1.07
377-2, rim	47.57	6.27	0.00	14.79	13.19	0.78	0.00	1.01	0.00	11.70	1.41
377-2, core	46.88	7.13	0.00	14.70	12.95	0.99	0.00	0.96	0.00	11.79	1.61
377-3, rim	46.03	6.93	0.00	15.32	12.83	0.93	0.00	1.07	0.00	11.89	1.39
377-3, core	47.75	6.50	0.00	14.51	13.37	0.82	0.00	1.00	0.00	11.70	1.43
377-4, rim	50.78	4.18	0.00	13.46	15.02	0.52	0.00	1.09	0.00	11.63	1.05
377-4, core	49.48	4.88	0.00	14.25	14.45	0.50	0.00	1.11	0.00	11.72	1.13

Table 4. WCB/SP amphibole.

sample	K2O	Cl	F	Total	Si	Al	Fe3+	Fe2+	Mg	Ti
686B-1, rim	0.50	0.00	0.00	98.13	6.887	1.344	0.000	2.051	2.658	0.140
686B-1, inner ri	0.60	0.00	0.00	98.52	6.797	1.461	0.000	2.091	2.535	0.195
686E-3, rim	0.86	0.00	0.00	98.71	6.554	1.726	0.000	2.173	2.436	0.197
686E-3, step in	0.64	0.00	0.00	98.34	6.739	1.455	0.000	2.015	2.752	0.173
686E-3, core A	0.57	0.00	0.00	98.24	6.784	1.437	0.000	1.983	2.730	0.204
686E-3, core B	0.61	0.00	0.00	98.30	6.816	1.353	0.000	2.047	2.757	0.191
686E-3, step out	0.52	0.00	0.00	98.36	6.797	1.425	0.000	2.017	2.708	0.187
686E-3, rim	0.57	0.00	0.00	98.61	6.846	1.349	0.000	2.013	2.737	0.152
687-3, core	0.59	0.00	0.00	97.35	6.776	1.474	0.000	2.145	2.583	0.167
687-3, step out	0.55	0.00	0.00	97.13	6.852	1.420	0.000	2.157	2.519	0.153
687-3, rim	0.66	0.00	0.00	97.26	6.920	1.375	0.000	2.116	2.561	0.105
687 gm 1, ave.	0.57	0.00	0.00	96.82	6.904	1.418	0.000	2.158	0.003	0.075
687 gm 2, ave.	0.60	0.00	0.00	97.12	6.857	1.419	0.000	2.140	2.538	0.124
771 gm 1, ave.	0.44	0.00	0.00	97.53	6.682	1.776	0.000	2.043	2.490	0.148
771 gm 2, ave.	0.45	0.00	0.00	97.44	6.698	1.726	0.000	2.081	2.558	0.153
771-3, core	0.40	0.00	0.00	97.86	6.788	1.614	0.000	2.062	2.580	0.165
771-3, step out	0.54	0.00	0.00	97.83	6.589	1.791	0.000	2.093	2.465	0.228
771-3, step out	0.49	0.00	0.00	97.71	6.763	1.649	0.000	2.059	2.596	0.157
771-3, step out	0.50	0.00	0.00	98.05	6.956	1.471	0.000	2.044	2.690	0.173
771-3, rim	0.36	0.00	0.00	97.86	6.923	1.488	0.000	1.973	2.687	0.125
SL-IV-2, rim	0.27	0.00	0.00	96.29	7.121	1.285	0.000	1.544	3.059	0.034
SL-IV-2, mid-poin	0.54	0.00	0.00	96.68	6.925	1.524	0.000	1.650	2.874	0.086
SL-IV-2, core	0.51	0.00	0.00	96.63	6.903	1.555	0.000	1.720	2.839	0.078
645-1, ave.	1.36	0.00	0.00	98.05	6.392	2.108	0.000	1.947	2.384	0.236
645-4, ave.	1.16	0.00	0.00	97.52	6.511	2.000	0.000	1.943	2.448	0.202
377-2, rim	0.46	0.00	0.00	97.19	7.076	1.095	0.000	1.837	2.920	0.087
377-2, core	0.56	0.00	0.00	97.56	6.961	1.247	0.000	1.822	2.868	0.109
377-3, rim	0.59	0.00	0.00	96.87	6.924	1.228	0.000	1.925	2.875	0.092
377-3, core	0.49	0.00	0.00	97.57	7.059	1.132	0.000	1.792	2.946	0.091
377-4, rim	0.42	0.00	0.00	98.15	7.385	0.717	0.000	1.635	3.257	0.055
377-4, core	0.43	0.00	0.00	97.95	7.267	0.840	0.000	1.750	3.164	0.051

Table 4. WCB/SP amphibole.

sample	Cr	Mn	Ca	Na	K	TOTAL	Cl	F
686B-1, rim	0.000	0.057	1.920	0.371	0.091	15.517		
686B-1, inner ri	0.000	0.047	1.839	0.435	0.108	15.509		
686E-3, rim	0.000	0.039	1.958	0.398	0.162	15.642		
686E-3, step in	0.000	0.039	1.771	0.438	0.121	15.564		
686E-3, core A	0.000	0.035	1.810	0.438	0.104	15.523		
686E-3, core B	0.000	0.043	1.807	0.409	0.113	15.546		
686E-3, step out	0.000	0.047	1.843	0.421	0.095	15.540		
686E-3, rim	0.000	0.052	1.922	0.355	0.104	15.531		
687-3, core	0.000	0.057	1.805	0.459	0.110	15.577		
687-3, step out	0.000	0.048	1.804	0.437	0.101	15.501		
687-3, rim	0.000	0.048	1.921	0.335	0.123	15.504		
687 gm 1, ave.	0.000	0.048	1.928	0.354	0.106	15.513		
687 gm 2, ave.	0.000	0.048	1.927	0.349	0.115	15.517		
771 gm 1, ave.	0.000	0.035	1.864	0.358	0.083	15.479		
771 gm 2, ave.	0.000	0.043	1.778	0.359	0.083	15.480		
771-3, core	0.000	0.039	1.771	0.317	0.074	15.410		
771-3, step out	0.000	0.039	1.821	0.368	0.101	15.494		
771-3, step out	0.000	0.043	1.758	0.336	0.091	15.453		
771-3, step out	0.000	0.047	1.723	0.316	0.091	15.412		
771-3, rim	0.000	0.052	1.752	0.298	0.064	15.364		
SL-IV-2, rim	0.000	0.039	1.959	0.216	0.047	15.305		
SL-IV-2, mid-poin	0.000	0.043	1.919	0.265	0.100	15.386		
SL-IV-2, core	0.000	0.043	1.877	0.300	0.096	15.412		
645-1, ave.	0.000	0.017	1.898	0.363	0.258	15.603		
645-4, ave.	0.000	0.017	1.895	0.307	0.219	15.543		
377-2, rim	0.000	0.126	1.864	0.406	0.087	15.498		
377-2, core	0.000	0.118	1.875	0.462	0.104	15.565		
377-3, rim	0.000	0.132	1.917	0.402	0.110	15.650		
377-3, core	0.000	0.121	1.853	0.408	0.091	15.492		
377-4, rim	0.000	0.132	1.810	0.294	0.077	15.361		
377-4, core	0.000	0.138	1.840	0.319	0.077	15.446		

Table 4. Xenolith amphibole.

spl	SiO2	Al2O3	FeO	Fe2O3	MgO	TiO2	Cr2O3	MnO	BaO	CaO	Na2O
219A-1, ave.	43.34	10.41	20.73	0.00	8.82	0.92	0.00	0.29	0.00	11.14	1.40
219A-2, ave.	43.85	9.84	20.63	0.00	9.26	0.64	0.00	0.29	0.00	11.00	1.38
219A-4, ave.	44.39	9.18	19.89	0.00	10.04	0.61	0.00	0.22	0.00	11.13	1.23
219A-3, ave.	52.31	1.01	26.05	0.00	15.39	0.02	0.00	0.66	0.00	1.69	0.14
219A-5, ave.	52.57	1.07	26.90	0.00	15.14	0.02	0.00	0.65	0.00	1.49	0.14
7B-1, rim	41.82	14.34	21.25	0.00	6.57	0.62	0.00	0.25	0.00	10.70	1.41
7B-1, core	42.18	13.67	21.86	0.00	7.08	0.82	0.00	0.24	0.00	10.60	1.30
7B-2, rim	41.67	14.21	21.74	0.00	6.83	0.73	0.00	0.23	0.00	10.77	1.38
7B-2, core	41.61	13.78	22.48	0.00	6.70	1.20	0.00	0.28	0.00	10.63	1.30
7B-3, incl, gt	52.30	1.88	27.25	0.00	14.61	0.04	0.00	0.34	0.00	1.21	0.19
7B-4, incl, gt	51.80	2.04	27.57	0.00	14.36	0.04	0.00	0.31	0.00	1.39	0.20
7B-5, incl, gt	51.61	2.13	27.49	0.00	14.26	0.05	0.00	0.31	0.00	1.39	0.24
7BB-1, incl, gt	51.05	2.63	27.48	0.00	11.11	0.09	0.00	0.46	0.00	5.62	0.31
7BB-2, incl, gt	51.71	1.57	29.49	0.00	13.06	0.07	0.00	0.49	0.00	0.97	0.16
7BB-3, incl, gt	52.43	0.95	30.10	0.00	13.20	0.04	0.00	0.37	0.00	0.56	0.11
7BB-4, rim,plag	42.47	14.36	22.11	0.00	6.78	0.63	0.00	0.27	0.00	10.66	1.34
119-1	45.89	8.89	14.56	0.00	12.33	1.11	0.00	0.34	0.00	11.39	1.03
119-2	50.19	5.95	13.57	0.00	14.61	0.50	0.00	0.34	0.00	11.49	0.63
119-3	51.33	4.18	12.49	0.00	15.89	0.26	0.00	0.30	0.00	11.56	0.47
119-4	48.20	7.69	13.57	0.00	13.35	0.85	0.00	0.34	0.00	11.82	0.83
119-5	47.59	7.79	14.18	0.00	13.23	1.18	0.00	0.30	0.00	11.47	0.89
219B-1A	42.07	10.56	22.18	0.00	7.86	0.71	0.00	0.21	0.00	11.18	1.20
219B-1B	41.02	11.19	22.54	0.00	7.48	0.71	0.00	0.13	0.00	11.15	1.27
219B-2A	40.54	11.77	22.95	0.00	7.09	0.50	0.00	0.17	0.00	11.25	1.24
219B-2B	40.34	11.63	23.21	0.00	6.88	0.79	0.00	0.20	0.00	11.14	1.26
219B-3A	40.79	11.28	23.34	0.00	7.13	0.82	0.00	0.17	0.00	11.52	1.22
219B-3B	41.24	11.23	23.07	0.00	7.01	0.79	0.00	0.20	0.00	11.29	1.28
219B-4	41.34	10.93	22.46	0.00	7.43	1.04	0.00	0.17	0.00	11.34	1.13

Table 4. Xenolith amphibole.

spl	K2O	Cl	F	Sum	Si	Al	Fe2+	Mg	Ti	Cr
219A-1, ave.	0.76	0.00	0.00	97.82	6.601	1.868	2.637	1.998	0.103	0.000
219A-2, ave.	0.68	0.00	0.00	97.55	6.682	1.767	2.625	2.102	0.071	0.000
219A-4, ave.	0.69	0.00	0.00	97.38	6.747	1.641	2.528	2.274	0.066	0.000
219A-3, ave.	0.02	0.00	0.00	97.30	7.828	0.175	3.259	3.431	0.000	0.000
219A-5, ave.	0.02	0.00	0.00	98.01	7.831	0.168	3.347	3.360	0.000	0.000
7B-1, rim	0.44	0.00	0.00	97.39	6.373	2.571	2.705	1.489	0.057	0.000
7B-1, core	0.39	0.00	0.00	98.34	6.373	2.470	2.763	1.592	0.093	0.000
7B-2, rim	0.38	0.00	0.00	97.94	6.334	2.547	2.761	1.548	0.080	0.000
7B-2, core	0.50	0.00	0.00	98.48	6.324	2.466	2.854	1.516	0.134	0.000
7B-3, incl, gt	0.02	0.00	0.00	97.84	7.792	0.328	3.393	3.244	0.004	0.000
7B-4, incl, gt	0.03	0.00	0.00	97.75	7.744	0.359	3.444	3.198	0.004	0.000
7B-5, incl, gt	0.03	0.00	0.00	97.50	7.735	0.374	3.443	3.184	0.004	0.000
7BB-1, incl, gt	0.04	0.00	0.00	98.78	7.664	0.462	3.448	2.484	0.009	0.000
7BB-2, incl, gt	0.03	0.00	0.00	97.56	7.817	0.279	3.727	2.941	0.004	0.000
7BB-3, incl, gt	0.00	0.00	0.00	97.77	7.905	0.168	3.791	2.964	0.004	0.000
7BB-4, rim,plag	0.43	0.00	0.00	99.05	6.379	2.539	2.777	1.516	0.070	0.000
119-1	0.80	0.00	0.00	96.33	6.871	1.564	1.819	2.750	0.123	0.000
119-2	0.31	0.00	0.00	97.58	7.296	1.020	1.647	3.166	0.051	0.000
119-3	0.21	0.00	0.00	96.70	7.479	0.718	1.522	3.451	0.025	0.000
119-4	0.52	0.00	0.00	97.17	7.080	1.328	1.664	2.923	0.090	0.000
119-5	0.61	0.00	0.00	97.22	7.016	1.350	1.748	2.902	0.129	0.000
219B-1A	1.21	0.00	0.00	97.20	6.528	1.930	2.877	1.816	0.082	0.000
219B-1B	1.25	0.00	0.00	96.73	6.417	2.061	2.947	1.744	0.083	0.000
219B-2A	1.39	0.00	0.00	96.88	6.359	2.173	3.011	1.653	0.055	0.000
219B-2B	1.63	0.00	0.00	97.07	6.331	2.150	3.043	1.607	0.092	0.000
219B-3A	1.53	0.00	0.00	97.79	6.355	2.071	3.041	1.650	0.096	0.000
219B-3B	1.41	0.00	0.00	97.50	6.418	2.060	3.001	1.626	0.091	0.000
219B-4	1.39	0.00	0.00	97.21	6.436	2.005	2.923	1.722	0.119	0.000

Table 4. Xenolith amphibole.

sol	Mn	Ca	Na	K	TOTAL	Cl	F
219A-1, ave.	0.036	1.814	0.411	0.147	15.615		
219A-2, ave.	0.036	1.793	0.402	0.129	15.608		
219A-4, ave.	0.026	1.810	0.361	0.133	15.586		
219A-3, ave.	0.083	0.268	0.039	0.004	15.086		
219A-5, ave.	0.079	0.236	0.039	0.000	15.080		
7B-1, rim	0.031	1.744	0.416	0.085	15.490		
7B-1, core	0.026	1.716	0.377	0.071	15.481		
7B-2, rim	0.026	1.753	0.406	0.071	15.526		
7B-2, core	0.036	1.730	0.379	0.093	15.532		
7B-3, incl, gt	0.039	0.192	0.052	0.000	15.044		
7B-4, incl, gt	0.039	0.219	0.052	0.004	15.064		
7B-5, incl, gt	0.040	0.220	0.006	0.004	15.070		
7BB-1, incl, gt	0.057	0.903	0.088	0.004	15.119		
7BB-2, incl, gt	0.062	0.155	0.044	0.004	15.035		
7BB-3, incl, gt	0.044	0.088	0.031	0.000	14.996		
7BB-4, rim,plag	0.031	1.715	0.388	0.079	15.494		
119-1	0.039	1.823	0.294	0.149	15.432		
119-2	0.038	1.788	0.175	0.055	15.235		
119-3	0.034	1.805	0.128	0.038	15.202		
119-4	0.039	1.858	0.232	0.095	15.310		
119-5	0.034	1.808	0.255	0.112	15.354		
219B-1A	0.022	1.857	0.359	0.236	15.709		
219B-1B	0.014	1.868	0.381	0.248	15.763		
219B-2A	0.018	1.888	0.373	0.276	15.806		
219B-2B	0.023	1.869	0.382	0.322	15.819		
219B-3A	0.018	1.920	0.366	0.302	15.819		
219B-3B	0.022	1.882	0.383	0.278	15.762		
219B-4	0.018	1.891	0.338	0.274	15.726		

TABLE 5. Representative biotite analyses.

spl	grain	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	Total
30	bi1r	37.15	4.05	14.92	16.46	0.05	13.37	0.15	0.10	9.83	96.06
236A	bi2gm	37.46	4.44	12.96	21.13	0.07	10.53	0.15	0.17	9.72	96.62
236A	bi3gm	36.82	4.66	13.03	20.85	0.06	10.85	0.11	0.16	9.54	96.08
184	bi1c	38.77	2.82	13.88	12.03	0.04	18.53	0.12	0.15	9.40	95.74
184	bi3r	38.76	3.13	13.73	10.41	0.03	18.92	0.04	0.24	9.55	94.82
171	bi1	38.04	4.76	13.71	12.65	0.09	16.35	0.11	0.37	9.45	95.52
111	bi1c	40.67	3.38	14.18	17.23	0.10	11.54	0.15	1.31	9.17	97.72
194	bi1c	36.94	3.33	14.89	21.11	0.29	11.02	0.01	0.11	10.10	97.79
208	bi2r	36.72	3.19	14.36	20.27	0.29	10.80	0.00	0.14	9.99	95.76
317	bi1c	36.71	3.79	13.88	20.70	0.29	10.71	0.00	0.10	9.97	96.16
317	bi2av	35.77	3.53	14.76	19.64	0.26	10.81	0.02	0.12	9.82	94.73
317	bi4,5av	35.56	3.07	15.12	19.54	0.26	10.74	0.05	0.11	9.77	94.22
471	bi1av	35.78	3.52	13.91	20.76	0.27	11.16	0.02	0.11	9.28	94.81
471	bi2av	35.70	3.77	14.14	20.08	0.29	10.93	0.02	0.20	9.27	94.39
372A	bi1	36.56	3.25	13.04	21.63	0.38	11.29	0.00	0.11	9.94	96.20
372A	bi2	36.50	3.28	12.90	21.99	0.52	10.41	0.00	0.09	9.67	95.35
372A	bi4av	35.79	3.33	13.73	21.39	0.38	10.20	0.02	0.07	9.57	95.58
377A	bi1av	36.71	2.93	13.84	16.99	0.63	13.25	0.02	0.04	9.66	94.06
377A	bi2av	36.82	2.69	13.67	16.76	0.77	13.48	0.05	0.05	9.79	94.08
687	bi2r	36.02	3.58	14.31	19.87	0.24	11.14	0.02	0.13	8.82	94.12
687	bi2av	35.55	3.69	14.16	20.20	0.24	11.06	0.01	0.11	9.70	95.71
642A	bi2av	33.47	1.95	18.37	25.14	0.64	4.71	0.03	0.05	9.63	94.00
642A	bi3av	33.83	1.93	18.97	24.28	0.57	4.61	0.05	0.05	9.75	94.05
548	bi3av	35.22	4.02	13.81	19.98	0.17	11.13	0.02	0.08	9.01	93.45
548	bi4av	35.27	3.79	13.94	19.84	0.16	11.18	0.02	0.08	9.15	93.44
579	bi1av	35.55	3.56	14.21	20.77	0.21	10.62	0.02	0.09	9.30	94.34
579	bi2av	35.18	3.09	14.03	21.34	0.24	10.48	0.02	0.07	9.15	93.68
219D	bi1av	34.82	2.52	17.23	18.33	0.08	11.35	0.00	0.34	8.78	93.45
219D	bi2-4av	34.60	3.02	17.63	17.95	0.03	10.64	0.00	0.26	8.93	93.05
133	bi2,3av	35.62	3.79	14.32	16.39	0.09	13.30	0.04	0.02	8.91	92.47
133	bi4av	35.12	4.19	13.31	16.34	0.09	13.31	0.02	0.02	9.07	92.13

TABLE 5. Representative biotite analyses, *continued.*

spl	grain	Si	Ti	Al	Fe2+	Mn	Mg	Ca	Na	K	TOTAL
30	bi1r	5.559	0.455	2.632	2.059	0.006	2.983	0.024	0.028	1.875	15.621
236A	bi2gm	5.705	0.508	2.326	2.692	0.010	2.390	0.024	0.049	1.889	15.593
236A	bi3gm	5.637	0.536	2.351	2.669	0.008	2.476	0.019	0.047	1.864	15.607
184	bi1c	5.675	0.311	2.394	1.473	0.004	4.043	0.018	0.043	1.755	15.716
184	bi3r	5.692	0.346	2.376	1.278	0.004	4.143	0.007	0.070	1.789	15.704
171	bi1	5.616	0.529	2.386	1.562	0.011	3.599	0.018	0.106	1.779	15.605
111	bi1c	5.627	0.352	2.312	1.994	0.012	2.380	0.022	0.350	1.619	14.668
194	bi1c	5.563	0.377	2.643	2.658	0.037	2.473	0.001	0.031	1.941	15.724
208	bi2r	5.632	0.368	2.596	2.600	0.038	2.469	0.000	0.042	1.954	15.699
317	bi1c	5.622	0.437	2.506	2.652	0.038	2.446	0.000	0.029	1.948	15.676
317	bi2av	5.538	0.411	2.694	2.543	0.034	2.494	0.003	0.036	1.940	15.693
317	bi4,5av	5.531	0.359	2.773	2.542	0.034	2.490	0.008	0.033	1.939	15.710
471	bi1av	5.554	0.411	2.546	2.695	0.036	2.582	0.003	0.033	1.838	15.698
471	bi2av	5.549	0.441	2.591	2.610	0.038	2.532	0.003	0.060	1.838	15.662
372A	bi1	5.635	0.377	2.368	2.788	0.049	2.595	0.000	0.032	1.954	15.798
372A	bi2	5.681	0.384	2.367	2.862	0.069	2.415	0.000	0.026	1.921	15.725
372A	bi4av	5.605	0.392	2.535	2.802	0.050	2.381	0.003	0.021	1.912	15.701
377A	bi1av	5.647	0.339	2.510	2.186	0.082	3.038	0.003	0.012	1.896	15.713
377A	bi2av	5.666	0.311	2.480	2.157	0.100	3.091	0.008	0.015	1.922	15.750
687	bi2r	5.583	0.414	2.611	2.575	0.027	2.575	0.000	0.036	1.743	15.564
687	bi2av	5.524	0.431	2.594	2.625	0.032	2.561	0.002	0.033	1.923	15.725
642A	bi2av	5.368	0.235	3.474	3.372	0.087	1.126	0.005	0.016	1.971	15.654
642A	bi3av	5.390	0.231	3.563	3.235	0.077	1.095	0.009	0.015	1.982	15.597
548	bi3av	5.527	0.474	2.555	2.622	0.023	2.603	0.003	0.024	1.804	15.635
548	bi4av	5.534	0.447	2.579	2.603	0.021	2.614	0.003	0.024	1.832	15.657
579	bi1av	5.547	0.418	2.615	2.710	0.028	2.470	0.003	0.027	1.851	15.668
579	bi2av	5.552	0.367	2.610	2.816	0.032	2.465	0.003	0.021	1.842	15.708
219D	bi1av	5.389	0.293	3.144	2.373	0.011	2.618	0.000	0.102	1.734	15.664
219D	bi2-4av	5.370	0.353	3.226	2.330	0.004	2.461	0.000	0.078	1.768	15.590
133	bi2,3av	5.528	0.441	2.618	2.126	0.009	3.074	0.004	0.004	1.762	15.568
133	bi4av	5.489	0.491	2.573	2.132	0.009	3.100	0.000	0.004	1.807	15.605

TABLE 6.

SPINEL PHASE

SPL	xtal	SiO2	TiO2	Al2O3	Cr2O3	FeO(t)	MnO	MgO	CaO	TOTAL
555	mt1	0.07	5.61	2.40	0.71	84.18	0.11	0.29	0.00	93.37
555	mt2	0.03	10.50	2.76	0.82	79.07	0.32	1.92	0.00	95.41
555	mt3	0.16	11.39	3.90	0.52	78.00	0.69	0.45	0.00	95.11
555	nmt1av	0.41	11.59	1.89	0.80	78.07	0.96	0.09	0.43	94.24
699	mt1a	0.11	18.98	0.13	0.13	76.51	0.98	0.07	0.00	96.90
699	mt2	0.07	12.82	0.17	0.08	81.38	0.86	0.04	0.00	95.42
699	nmt1av	0.22	13.63	0.00	0.00	81.09	0.94	0.04	0.19	96.11
699	nmt3a	0.20	22.94	0.00	0.00	73.32	1.38	0.04	0.02	97.89
699	nmt5av	0.09	18.32	0.07	0.14	76.56	1.21	0.03	0.02	96.34
704	mt1av	0.13	12.84	0.00	0.00	77.74	0.43	2.02	0.18	93.34
704	mt3av	0.10	12.61	0.00	0.00	79.54	0.40	1.12	0.02	93.79
553	mt1av	0.08	13.11	0.06	1.70	79.29	1.02	0.04	0.05	95.34
584	mt3av	0.08	18.34	0.19	0.38	75.54	0.93	0.07	0.08	95.61
584	mt4av	0.08	14.64	0.05	0.39	78.76	0.97	0.04	0.06	94.98
584	mt5av	0.22	15.14	2.14	0.28	75.65	0.78	0.23	0.04	94.48
584	mt6av	0.07	17.38	0.31	0.36	76.07	1.31	0.03	0.07	95.60

SPINEL PHASE

SPL	xtal	Si	Ti	Al	Cr	Fe(t)	Mn	Mg	TOTAL
555	mt1	0.002	0.160	0.108	0.021	2.690	0.003	0.016	3.000
555	mt2	0.000	0.292	0.120	0.024	2.449	0.010	0.105	3.000
555	mt3	0.005	0.320	0.171	0.014	2.443	0.021	0.025	3.000
555	nmt1av	0.016	0.332	0.085	0.024	2.489	0.031	0.005	3.000
699	mt1a	0.003	0.538	0.006	0.003	2.416	0.031	0.003	3.000
699	mt2	0.002	0.367	0.006	0.002	2.594	0.027	0.001	3.000
699	nmt1av	0.008	0.388	0.000	0.000	2.564	0.030	0.002	3.000
699	nmt3a	0.006	0.648	0.000	0.000	2.302	0.043	0.001	3.000
699	nmt5av	0.004	0.522	0.003	0.004	2.426	0.039	0.002	3.000
704	mt1av	0.005	0.370	0.000	0.000	2.491	0.014	0.115	3.000
704	mt3av	0.003	0.364	0.000	0.000	2.557	0.012	0.063	3.000
553	mt1av	0.002	0.377	0.002	0.050	2.534	0.032	0.001	3.000
584	mt3av	0.002	0.527	0.008	0.011	2.417	0.029	0.003	3.000
584	mt4av	0.002	0.422	0.001	0.011	2.529	0.030	0.001	3.000
584	mt5av	0.008	0.434	0.095	0.008	2.417	0.025	0.012	3.000
584	mt6av	0.002	0.499	0.013	0.010	2.431	0.041	0.001	2.999

TABLE 6.
SPINEL PHASE, *continued.*

SPL	xtal	Fe3+	Fe2+	XFe2+	XFe3+	X'usp
555	mt1	1.546	1.144	0.984	0.923	0.181
555	mt2	1.272	1.177	0.911	0.899	0.318
555	mt3	1.164	1.279	0.965	0.862	0.381
555	nmt1av	1.195	1.294	0.960	0.916	0.368
699	mt1a	0.907	1.508	0.978	0.990	0.540
699	mt2	1.253	1.341	0.980	0.993	0.366
699	nmt1av	1.208	1.356	0.971	1.000	0.384
699	nmt3a	0.692	1.609	0.973	1.000	0.646
699	nmt5av	0.942	1.484	0.973	0.992	0.521
704	mt1av	1.251	1.240	0.902	1.000	0.348
704	mt3av	1.265	1.292	0.945	1.000	0.352
553	mt1av	1.190	1.344	0.975	0.958	0.392
584	mt3av	0.922	1.495	0.977	0.980	0.533
584	mt4av	1.138	1.392	0.976	0.989	0.423
584	mt5av	1.013	1.404	0.974	0.908	0.479
584	mt6av	0.976	1.455	0.970	0.977	0.504

TABLE 7. PLAGIOCLASE

Sample	SiO2	Al2O3	FeO	CaO	Na2O	K2O	TiO2	SrO	TOTAL
704-1, core	54.80	28.25	0.48	11.02	4.95	0.38	0.05	0.17	100.09
704-1, mid-point	55.22	27.79	0.57	10.59	5.18	0.41	0.02	0.05	99.83
704-1, rim B	55.39	27.77	0.48	10.63	5.29	0.39	0.03	0.02	100.00
704-1, rim A	53.61	29.39	0.63	11.84	4.59	0.30	0.04	0.03	100.43
704-1, rim C	53.26	29.52	0.55	12.38	4.29	0.30	0.08	0.00	100.39
704 gm	55.24	28.14	0.60	10.71	5.29	0.27	0.08	0.13	100.46
704-2, rim	55.25	27.60	0.54	10.14	5.33	0.45	0.09	0.07	99.48
704-2, step in	54.94	28.67	0.49	10.90	4.94	0.38	0.07	0.08	100.47
704-2, step in	55.20	28.20	0.49	10.84	4.93	0.39	0.08	0.00	100.13
704-2, core A	54.43	29.10	0.44	11.61	4.71	0.31	0.07	0.16	100.83
704-2, core B	54.34	28.66	0.50	11.46	4.73	0.35	0.00	0.02	100.06
704-3, rim	54.77	28.48	0.59	11.15	4.95	0.34	0.05	0.10	100.43
704-3, step in	55.56	28.11	0.59	10.77	5.22	0.36	0.00	0.14	100.75
704-3, step in	55.38	28.36	0.45	10.76	5.18	0.38	0.04	0.31	100.86
704-3, step in	55.01	28.73	0.45	11.02	4.82	0.38	0.00	0.00	100.40
704-3, step in	53.22	29.46	0.58	12.02	4.43	0.30	0.07	0.02	100.09
704-3, core	54.51	28.86	0.48	11.20	4.73	0.35	0.01	0.19	100.33
704-4, core	55.62	28.11	0.56	10.60	5.19	0.34	0.00	0.02	100.44
704-4, rim	53.83	29.16	0.56	11.75	4.60	0.28	0.02	0.00	100.20
704-4, mid-point	55.00	28.28	0.50	10.71	5.04	0.36	0.07	0.17	100.13
553-3, core A	52.05	29.94	0.60	13.68	3.90	0.31	0.00	0.02	100.49
553-3, core B	54.17	28.61	0.54	12.12	4.57	0.39	0.07	0.08	100.55
553-3, rim	53.62	28.79	0.59	12.57	4.50	0.35	0.00	0.07	100.68
557 gm 1, rim	54.66	28.31	0.55	11.39	4.81	0.37	0.07	0.17	100.33
557 gm 2, core	54.11	28.45	0.56	11.38	4.81	0.44	0.02	0.14	99.91
557 gm 2, core	54.32	28.22	0.48	11.07	4.98	0.46	0.04	0.08	99.65
557-2, core	52.93	29.53	0.53	12.60	4.09	0.33	0.09	0.00	100.10
557-2, rim	53.22	29.29	0.59	12.38	4.35	0.32	0.14	0.08	100.38
557-2, step in	54.82	28.31	0.58	11.14	4.71	0.41	0.04	0.05	100.08
557-2, step in	52.75	29.79	0.59	12.58	4.05	0.33	0.16	0.00	100.25
557-2, rim B	52.67	29.87	0.58	12.64	3.93	0.30	0.07	0.04	100.10
164-3, rim	54.95	28.82	0.56	10.95	4.98	0.35	0.09	0.11	100.81
164-3, core	52.80	29.64	0.53	12.24	4.46	0.32	0.04	0.23	100.26
164-3, mid-point	49.98	31.84	0.56	14.50	3.06	0.08	0.05	0.00	100.06
555-1, core	45.88	34.70	0.25	17.43	1.33	0.04	0.10	0.16	99.89
555-1, rim	49.96	32.50	0.23	14.95	2.94	0.07	0.03	0.00	100.68
555-2, core	47.71	33.84	0.26	16.39	2.07	0.07	0.00	0.00	100.35
590 gm 1	50.00	31.91	0.12	14.45	3.25	0.08	0.00	0.17	99.98
590 gm 2	48.94	32.64	0.14	15.77	2.65	0.04	0.07	0.00	100.26
590 gm 3	48.51	32.72	0.23	15.54	2.52	0.04	0.02	0.02	99.60
590 gm 4	48.97	32.16	0.10	14.91	2.87	0.03	0.07	0.00	99.11
103-1 core A	55.01	29.21	0.10	10.80	5.08	0.09	0.04	0.14	100.47
103-1, core B	53.87	29.54	0.15	12.00	4.28	0.11	0.00	0.05	100.00
103-1 outer core	55.80	28.04	0.11	10.49	4.69	0.12	0.02	0.05	100.34
103-2 rim	55.95	28.74	0.14	10.32	5.12	0.12	0.08	0.16	100.62
103-2 core	55.16	29.23	0.07	11.16	4.66	0.08	0.00	0.04	100.39
103-3, rim	56.56	28.52	0.10	9.95	5.07	0.07	0.03	0.20	100.49
699-2, core	52.20	29.57	0.56	13.09	3.90	0.30	0.00	0.30	99.99
699-2 mid-point	50.47	30.92	0.53	14.31	3.17	0.22	0.00	0.28	99.90
699-2 rim	49.32	31.61	0.55	15.39	2.75	0.21	0.00	0.32	100.22
699-2 step in	50.04	31.16	0.53	14.72	3.11	0.24	0.00	0.30	100.11
699-2 step in	48.63	31.69	0.51	15.40	2.61	0.14	0.00	0.25	99.27
699-1, core	54.20	28.07	0.41	11.11	4.81	0.48	0.00	0.31	99.43

TABLE 7. PLAGIOCLASE

Sample	Si	Al	Fe	Ca	Na	K	Ti	Sr	TOTAL
704-1, core	2.474	1.504	0.017	0.533	0.433	0.021	0.001	0.004	4.987
704-1, mid-point	2.500	1.482	0.021	0.513	0.454	0.022	0.000	0.001	4.994
704-1, rim B	2.501	1.478	0.017	0.514	0.462	0.021	0.000	0.000	4.994
704-1, rim A	2.420	1.563	0.022	0.572	0.401	0.017	0.001	0.000	4.997
704-1, rim C	2.407	1.573	0.020	0.599	0.375	0.017	0.002	0.000	4.993
704 gm	2.486	1.493	0.022	0.516	0.461	0.014	0.002	0.002	4.997
704-2, rim	2.507	1.475	0.020	0.492	0.468	0.025	0.002	0.001	4.990
704-2, step in	2.471	1.519	0.017	0.525	0.430	0.021	0.001	0.001	4.985
704-2, step in	2.488	1.498	0.017	0.523	0.431	0.021	0.002	0.000	4.981
704-2, core A	2.444	1.539	0.016	0.557	0.410	0.017	0.001	0.004	4.988
704-2, core B	2.458	1.527	0.019	0.555	0.414	0.020	0.000	0.000	4.992
704-3, rim	2.468	1.511	0.021	0.538	0.432	0.018	0.001	0.001	4.990
704-3, step in	2.493	1.486	0.021	0.517	0.453	0.020	0.000	0.002	4.992
704-3, step in	2.482	1.498	0.016	0.517	0.450	0.021	0.001	0.008	4.992
704-3, step in	2.474	1.522	0.016	0.530	0.419	0.021	0.000	0.000	4.982
704-3, step in	2.413	1.573	0.021	0.583	0.388	0.017	0.001	0.000	4.996
704-3, core	2.458	1.533	0.017	0.540	0.413	0.020	0.000	0.004	4.984
704-4, core	2.498	1.488	0.021	0.510	0.451	0.018	0.000	0.000	4.985
704-4, rim	2.433	1.553	0.021	0.569	0.403	0.016	0.000	0.000	4.995
704-4, mid-point	2.481	1.504	0.018	0.518	2.441	0.020	0.001	0.004	4.986
553-3, core A	2.363	1.603	0.023	0.666	0.343	0.018	0.000	0.001	5.016
553-3, core B	2.446	1.523	0.020	0.586	0.400	0.023	0.002	0.002	5.002
553-3, rim	2.431	1.533	0.022	0.608	0.394	0.020	0.000	0.002	5.010
557 gm 1, rim	2.466	1.505	0.020	0.549	0.419	0.021	0.001	0.004	4.986
557 gm 2, core	2.456	1.522	0.020	0.562	0.423	0.025	0.000	0.002	5.000
557 gm 2, core	2.466	1.509	0.017	0.538	0.438	0.026	0.001	0.001	4.997
557-2, core	2.401	1.579	0.020	0.612	0.359	0.019	0.002	0.000	4.992
557-2, rim	2.410	1.563	0.021	0.600	0.381	0.017	0.004	0.001	4.997
557-2, step in	2.476	1.507	0.021	0.538	0.412	0.022	0.001	0.001	4.978
557-2, step in	2.390	1.590	0.021	0.610	0.355	0.019	0.005	0.000	4.990
557-2, rim B	2.389	1.596	0.021	0.613	0.344	0.017	0.001	0.000	4.981
164-3, rim	2.465	1.522	0.021	0.525	0.432	0.020	0.002	0.002	4.989
164-3, core	2.394	1.583	0.020	0.595	0.391	0.017	0.001	0.005	5.006
164-3, mid-point	2.279	1.710	0.020	0.708	0.270	0.004	0.001	0.000	4.991
555-1, core	2.113	1.883	0.009	0.860	0.119	0.001	0.002	0.004	4.992
555-1, rim	2.264	1.736	0.008	0.725	0.258	0.004	0.000	0.000	4.994
555-2, core	2.179	1.821	0.005	0.801	0.184	0.004	0.000	0.000	4.999
590 gm 1	2.280	1.714	0.004	0.705	0.288	0.004	0.000	0.004	4.999
590 gm 2	2.232	1.754	0.004	0.771	0.234	0.001	0.001	0.000	4.997
590 gm 3	2.227	1.771	0.008	0.764	0.224	0.001	0.000	0.000	4.994
590 gm 4	2.253	1.745	0.002	0.734	0.255	0.001	0.001	0.000	4.992
103-1 core A	2.465	1.542	0.002	0.518	0.440	0.004	0.001	0.002	4.974
103-1, core B	2.432	1.571	0.005	0.580	0.374	0.005	0.000	0.001	4.968
103-1 outer core	2.494	1.529	0.004	0.502	0.406	0.006	0.000	0.001	4.542
103-2 rim	2.498	1.512	0.004	0.493	0.443	0.006	0.002	0.004	4.962
103-2 core	2.471	1.542	0.002	0.525	0.403	0.004	0.000	0.000	4.958
103-3, rim	2.521	1.498	0.002	0.475	0.437	0.002	0.000	0.004	4.940
699-2, core	2.380	1.589	0.020	0.638	0.344	0.017	0.000	0.006	4.995
699-2 mid-point	2.310	1.667	0.020	0.701	0.280	0.012	0.000	0.006	4.996
699-2 rim	2.280	1.706	0.020	0.754	0.243	0.012	0.000	0.008	5.003
699-2 step in	2.289	1.680	0.020	0.721	0.275	0.013	0.002	0.008	5.005
699-2 step in	2.249	1.727	0.019	0.763	0.233	0.006	0.000	0.005	5.002
699-1, core	2.470	1.507	0.015	0.542	0.424	0.020	0.000	0.009	4.992

TABLE 7. PLAGIOCLASE

Sample	SiO2	Al2O3	FeO	CaO	Na2O	K2O	TiO2	SrO	TOTAL
699-1, rim	56.02	27.55	0.37	10.14	5.41	0.50	0.00	0.32	100.40
699-1, mid-point	55.75	27.51	0.38	10.36	5.47	0.42	0.00	0.27	100.24
548-3, rim	58.60	26.61	0.07	8.16	6.64	0.22	0.00	0.30	100.62
548-3, step in	56.83	27.38	0.11	9.29	6.05	0.27	0.00	0.29	100.18
548-3, step in	55.28	28.57	0.10	10.64	5.20	0.21	0.00	0.32	100.46
548-3, core	57.75	26.67	0.13	8.84	6.44	0.28	0.00	0.34	100.45
551-1, core	57.02	27.50	0.17	9.52	5.85	0.34	0.00	0.32	100.74
551-1, rim	60.32	25.07	0.11	6.63	7.26	0.59	0.00	0.31	100.32
551-1, mid-point	57.32	27.16	0.17	9.41	6.17	0.37	0.00	0.34	100.97
551-3, core	59.00	26.09	0.13	8.15	6.67	0.46	0.00	0.28	100.85
551-3, step out	61.65	24.08	0.11	6.03	7.65	0.70	0.00	0.27	100.49
551-3, step out	57.15	27.93	0.16	9.57	5.91	0.34	0.00	0.27	100.33
551-3, step out	61.28	24.26	0.10	6.01	7.85	0.70	0.00	0.25	100.24
551-3, rim	61.44	24.06	0.12	5.97	7.82	0.68	0.00	0.26	100.37
551 gm, core	59.48	24.48	0.14	7.67	6.93	0.50	0.00	0.30	100.50
551 gm, rim	60.73	24.77	0.10	6.68	7.34	0.59	0.00	0.34	100.55
693-4, rim	55.36	28.49	0.21	9.82	5.47	0.18	0.00	0.27	99.82
693-4, step in	55.54	28.14	0.14	9.67	5.58	0.19	0.00	0.29	99.55
693-4, step in	55.66	27.75	0.19	9.09	5.88	0.21	0.00	0.27	99.09
693-4, core	56.50	27.62	0.18	9.07	6.00	0.27	0.00	0.31	100.01
697-1, rim	59.32	25.48	0.07	6.99	7.48	0.22	0.00	0.30	99.88
697-2, rim	60.05	25.16	0.06	6.28	7.88	0.33	0.00	0.25	100.01
697-2, step in	55.57	27.73	0.09	9.72	5.77	0.21	0.00	0.30	99.38
697-2, step in	58.25	26.48	0.10	8.04	6.77	0.29	0.00	0.27	100.21
697-2, core	59.73	25.48	0.08	6.87	7.41	0.26	0.00	0.27	100.13
579-1, rim	60.75	24.56	0.05	6.02	8.09	0.27	0.00	0.22	99.97
579-1, step in	60.03	24.82	0.08	6.25	7.86	0.24	0.00	0.27	99.63
579-1, step in	57.05	26.66	0.06	8.35	6.47	0.23	0.00	0.30	99.15
579-1, core	58.36	26.27	0.11	7.63	7.00	0.32	0.00	0.26	99.98
579-2, rim	53.21	29.76	0.11	11.68	4.68	0.09	0.00	0.25	99.84
579-2, core	56.09	27.50	0.04	9.29	6.08	0.16	0.00	0.25	99.51
379-3, core	54.97	28.48	0.14	10.56	5.44	0.13	0.00	0.27	100.00
379-3, mid-point	54.23	28.81	0.14	10.79	5.32	0.14	0.00	0.32	99.77
379-3, rim	56.38	27.64	0.15	9.78	6.08	0.24	0.00	0.29	100.61
471-1, core	57.20	26.59	0.17	8.37	6.53	0.33	0.00	0.34	99.61
471-1, rim	61.09	24.23	0.15	5.43	8.15	0.32	0.00	0.25	99.63
471-2, rim	57.35	26.54	0.16	8.52	6.54	0.22	0.00	0.33	99.66
471-2, core	55.79	27.87	0.17	9.95	5.78	0.21	0.00	0.32	100.09
397-2, rim	55.89	27.77	0.17	9.68	5.89	0.13	0.00	0.27	99.80
397-2, core	57.02	26.45	0.25	8.40	6.55	0.27	0.00	0.29	99.26
397-2, mid-point	55.73	27.93	0.19	9.53	5.71	0.21	0.00	0.27	100.07
397-3, rim	58.19	26.11	0.14	7.69	7.05	0.17	0.00	0.27	99.66
397-3, core	53.63	29.27	0.13	11.33	4.84	0.14	0.00	0.24	99.65
257-1, core	46.74	34.18	0.22	16.52	1.79	0.01	0.00	0.26	99.76
257-1, rim	45.27	34.96	0.16	17.72	1.00	0.00	0.00	0.25	99.36
257-2, core	47.72	33.46	0.21	15.82	2.05	0.11	0.00	0.25	99.69
257-1, rim	46.58	33.50	1.06	16.20	1.71	0.02	0.00	0.27	99.34
264-1, ave.	53.64	29.68	0.09	11.46	4.50	0.20	0.00	0.24	99.83
171 gm	54.54	28.50	0.36	10.63	5.10	0.31	0.00	0.00	99.42
171-2, rim	49.91	32.32	0.21	14.98	2.84	0.12	0.00	0.00	100.39
184-1, core	51.54	31.10	0.19	13.31	3.82	0.13	0.00	0.00	100.09
184-1, rim	57.67	27.28	0.15	8.87	6.48	0.32	0.00	0.00	100.78
184-2, core	49.86	32.19	0.23	14.85	3.04	0.12	0.00	0.00	100.29

TABLE 7. PLAGIOCLASE

Sample	Si	Al	Fe	Ca	Na	K	Ti	Sr	TOTAL
699-1, rim	2.521	1.460	0.013	0.488	0.471	0.033	0.000	0.008	4.995
699-1, mid-point	2.515	1.462	0.013	0.500	0.478	0.023	0.000	0.006	4.998
548-3, rim	2.607	1.394	0.002	0.389	0.572	0.012	0.000	0.006	4.982
548-3, step in	2.548	1.446	0.004	0.443	0.526	0.014	0.000	0.006	4.988
548-3, step in	2.484	1.512	0.006	0.511	0.452	0.012	0.000	0.008	4.985
548-3, core	2.583	1.405	0.004	0.422	0.558	0.016	0.000	0.008	4.996
551-1, core	2.547	1.448	0.006	0.496	0.507	0.019	0.000	0.006	4.992
551-1, rim	2.684	1.315	0.004	0.316	0.627	0.034	0.000	0.008	4.988
551-1, mid-point	2.557	1.429	0.006	0.450	0.534	0.021	0.000	0.009	5.006
551-3, core	2.624	1.368	0.005	0.388	0.575	0.026	0.000	0.007	4.993
551-3, step out	2.733	1.259	0.004	0.286	0.658	0.040	0.000	0.006	4.986
551-3, step out	2.537	1.462	0.006	0.455	0.509	0.019	0.000	0.007	4.995
551-3, step out	2.721	1.270	0.004	0.286	0.676	0.040	0.000	0.007	5.002
551-3, rim	2.729	1.260	0.005	0.284	0.674	0.039	0.000	0.007	4.997
551 gm, core	2.650	1.338	0.005	0.366	0.599	0.028	0.000	0.008	4.994
551 gm, rim	2.696	1.297	0.004	0.318	0.632	0.033	0.000	0.009	4.989
693-4, rim	2.497	1.514	0.006	0.474	0.478	0.009	0.000	0.006	4.983
693-4, step in	2.509	1.499	0.004	0.468	0.488	0.010	0.000	0.006	4.984
693-4, step in	2.525	1.482	0.006	0.440	0.516	0.012	0.000	0.006	4.988
693-4, core	2.539	1.462	0.006	0.437	0.522	0.014	0.000	0.008	4.988
697-1, rim	2.652	1.342	0.002	0.334	0.648	0.012	0.000	0.008	4.999
697-2, rim	2.677	1.321	0.001	0.299	0.680	0.018	0.000	0.006	5.003
697-2, step in	2.517	1.479	0.002	0.472	0.506	0.012	0.000	0.008	4.996
697-2, step in	2.603	1.394	0.002	0.384	0.586	0.016	0.000	0.006	4.991
697-2, core	2.661	1.338	0.002	0.327	0.639	0.014	0.000	0.006	4.988
579-1, rim	2.707	1.289	0.001	0.286	0.698	0.014	0.000	0.005	5.000
579-1, step in	2.688	1.310	0.002	0.299	0.682	0.013	0.000	0.006	5.000
579-1, step in	2.581	1.420	0.001	0.403	0.566	0.013	0.000	0.006	4.991
579-1, core	2.613	1.386	0.004	0.365	0.606	0.017	0.000	0.006	4.997
579-2, rim	2.412	1.590	0.004	0.566	0.411	0.004	0.000	0.005	4.991
579-2, core	2.533	1.463	0.001	0.449	0.531	0.008	0.000	0.006	4.993
379-3, core	2.481	1.515	0.005	0.511	0.476	0.008	0.000	0.007	5.003
379-3, mid-point	2.458	1.539	0.005	0.524	0.468	0.008	0.000	0.009	5.010
379-3, rim	2.527	1.461	0.006	0.470	0.529	0.014	0.000	0.008	5.014
471-1, core	2.580	1.414	0.005	0.403	0.570	0.018	0.000	0.008	4.999
471-1, rim	2.726	1.274	0.005	0.259	0.704	0.017	0.000	0.006	4.991
471-2, rim	2.583	1.408	0.005	0.411	0.571	0.012	0.000	0.008	4.998
471-2, core	2.512	1.479	0.005	0.479	0.503	0.012	0.000	0.008	4.998
397-2, rim	2.520	1.476	0.005	0.467	0.515	0.006	0.000	0.006	4.995
397-2, core	2.581	1.410	0.009	0.406	0.574	0.014	0.000	0.006	5.000
397-2, mid-point	2.510	1.481	0.006	0.478	0.498	0.012	0.000	0.006	4.993
397-3, rim	2.615	1.382	0.005	0.369	0.613	0.009	0.000	0.006	4.999
397-3, core	2.435	1.565	0.004	0.550	0.425	0.006	0.000	0.005	4.990
257-1, core	2.151	1.854	0.008	0.814	0.159	0.000	0.000	0.006	4.992
257-1, rim	2.098	1.910	0.005	0.880	0.089	0.000	0.000	0.005	4.989
257-2, core	2.195	1.814	0.006	0.779	0.182	0.005	0.000	0.005	4.987
257-1, rim	2.159	1.830	0.041	0.804	0.153	0.001	0.000	0.006	4.993
264-1, ave.	2.429	1.583	0.002	0.555	0.395	0.010	0.000	0.005	4.979
171 gm	2.475	1.524	0.014	0.517	0.448	0.018	0.000	0.000	4.996
171-2, rim	2.268	1.731	0.008	0.730	0.250	0.007	0.000	0.000	4.995
184-1, core	2.339	1.664	0.007	0.647	0.336	0.008	0.000	0.000	5.001
184-1, rim	2.568	1.432	0.006	0.423	0.559	0.018	0.000	0.000	5.005
184-2, core	2.270	1.727	0.009	0.724	0.258	0.007	0.000	0.000	5.004

TABLE 7. PLAGIOCLASE

Sample	SiO2	Al2O3	FeO	CaO	Na2O	K2O	TiO2	SrO	TOTAL
184-2, rim	54.23	28.75	0.43	10.53	5.48	0.29	0.00	0.00	99.70
236A-1, core	51.15	30.99	0.17	14.32	3.57	0.15	0.00	0.00	100.35
236A-1, mid-poin	56.79	27.43	0.25	9.40	6.15	0.32	0.00	0.00	100.34
236A-1, rim	54.27	28.81	0.42	11.05	5.11	0.19	0.00	0.00	99.85
30-1, core	54.96	28.01	0.29	11.09	5.11	0.26	0.00	0.00	99.44
30-1, rim	57.40	27.31	0.15	9.21	6.52	0.27	0.00	0.00	100.85
30-2, core	53.93	29.25	0.09	11.11	4.93	0.22	0.00	0.00	99.52
30-2, rim	57.75	27.13	0.12	8.90	6.26	0.30	0.00	0.00	100.46
111-1, core	53.44	30.03	0.18	11.68	4.76	0.30	0.00	0.00	100.39
111-1, mid-point	54.92	29.23	0.13	11.33	4.98	0.29	0.00	0.00	100.88
111-1, rim	51.19	31.09	0.13	13.45	3.81	0.17	0.00	0.00	99.85
194-2, core	55.70	27.91	0.14	9.92	5.99	0.11	0.00	0.00	99.77
194-2, mid-point	56.42	27.66	0.39	9.71	6.13	0.17	0.00	0.00	100.47
194-2, rim	57.11	27.41	0.19	9.06	6.27	0.20	0.00	0.00	100.23
208-1, core	57.84	26.72	0.25	8.36	6.67	0.22	0.00	0.00	100.07
208-1, mid-point	57.60	26.77	0.27	8.57	6.48	0.33	0.00	0.00	100.02
317-1, core A	56.61	27.75	0.48	9.39	6.04	0.27	0.00	0.00	100.54
317-1, core B	56.36	27.32	0.43	9.55	5.97	0.22	0.00	0.00	99.86
372A-3, core	56.11	27.38	0.21	9.06	6.32	0.18	0.00	0.00	99.26
372A-3, mid-poin	59.88	25.44	0.21	6.89	7.43	0.34	0.00	0.00	100.19
372A-3, rim	60.24	24.56	0.13	5.78	8.03	0.38	0.00	0.00	99.11
377-1, core	59.79	24.59	0.13	6.28	7.65	0.37	0.00	0.39	99.19
377-1, step out	61.27	23.68	0.04	5.26	8.22	0.48	0.00	0.41	99.36
377-1, step out	62.10	22.64	0.15	4.05	8.89	0.44	0.00	0.36	98.64
377-1, step out	61.58	23.75	0.14	5.12	8.48	0.20	0.00	0.37	99.64
377-1, rim	65.36	21.29	0.21	2.25	10.07	0.37	0.00	0.25	99.79
642a-1, core	60.60	24.29	0.00	5.75	8.00	0.27	0.00	0.30	99.20
642a-1, mid-poin	63.77	22.52	0.07	3.59	9.43	0.20	0.00	0.25	99.82
642a-1, rim	64.12	22.55	0.04	3.65	9.43	0.17	0.00	0.21	100.16
681-1, rim	56.63	26.69	0.16	9.04	6.19	0.28	0.00	0.29	99.29
681a-1, step in	56.33	26.91	0.16	9.45	6.00	0.21	0.00	0.28	99.34
681a-1, step in	56.20	26.47	0.16	8.83	6.29	0.14	0.00	0.28	98.37
681a-1, step in	56.99	26.63	0.18	9.04	6.07	0.22	0.00	0.31	99.44
681a-1, core	55.93	27.40	0.19	9.71	5.82	0.25	0.00	0.29	99.60
681a-4, core	55.00	27.75	0.09	10.20	5.54	0.00	0.00	0.31	98.89
681a-4, mid-poin	57.20	26.37	0.11	8.92	6.32	0.18	0.00	0.34	99.43
681a-4, rim	55.72	27.32	0.18	9.66	5.78	0.18	0.00	0.29	99.13
681a gm 2	56.36	26.95	0.16	9.36	6.12	0.16	0.00	0.31	99.40
681a gm 3	56.72	26.61	0.11	9.07	6.14	0.14	0.00	0.28	99.07
687-1, rim	58.08	26.37	0.15	8.18	6.62	0.19	0.00	0.30	99.89
687-1, mid-point	57.63	26.46	0.13	8.62	6.44	0.22	0.00	0.32	99.82
687-1, core	56.70	26.38	0.20	8.75	6.46	0.29	0.00	0.28	99.05
687-3, core	55.73	27.69	0.17	9.66	5.68	0.21	0.00	0.31	99.45
687-3, step out	55.66	27.82	0.19	10.04	5.60	0.20	0.00	0.27	99.77
687-3, step out	56.96	26.68	0.17	8.96	6.28	0.20	0.00	0.31	99.57
687-3, rim	59.03	25.25	0.14	7.09	7.43	0.28	0.00	0.29	99.50
777b-2, core	55.21	27.73	0.10	10.17	5.53	0.13	0.00	0.34	99.20
777b-2, rim	56.09	27.45	0.08	9.67	5.80	0.07	0.00	0.30	99.46
639-1A	50.27	31.56	0.12	14.42	3.04	0.07	0.00	0.28	99.75
639-1B	56.08	28.02	0.10	9.95	5.56	0.07	0.00	0.29	100.06
639-1C	52.56	30.21	0.08	12.41	4.11	0.08	0.00	0.31	99.75
639-4, ave.	55.59	28.09	0.08	10.38	5.59	0.15	0.00	0.27	100.14
638-1, ave.	58.88	25.88	0.05	7.86	6.90	0.33	0.00	0.11	100.01

TABLE 7. PLAGIOCLASE

Sample	Si	Al	Fe	Ca	Na	K	Ti	Sr	TOTAL
184-2, rim	2.459	1.537	0.016	0.511	0.481	0.017	0.000	0.000	5.021
236A-1, core	2.323	1.659	0.006	0.697	0.314	0.009	0.000	0.000	5.009
236A-1, mid-point	2.545	1.449	0.009	0.451	0.535	0.018	0.000	0.000	5.007
236A-1, rim	2.457	1.537	0.016	0.536	0.449	0.011	0.000	0.000	5.005
30-1, core	2.484	1.499	0.011	0.539	0.450	0.015	0.000	0.000	4.999
30-1, rim	2.557	1.434	0.005	0.440	0.563	0.015	0.000	0.000	5.015
30-2, core	2.445	1.563	0.003	0.539	0.433	0.012	0.000	0.000	4.995
30-2, rim	2.576	1.426	0.004	0.425	0.542	0.017	0.000	0.000	4.990
111-1, core	2.409	1.596	0.007	0.564	0.416	0.017	0.000	0.000	5.009
111-1, mid-point	2.458	1.541	0.005	0.543	0.432	0.016	0.000	0.000	4.996
111-1, rim	2.331	1.669	0.005	0.656	0.336	0.010	0.000	0.000	5.007
194-2, core	2.512	1.484	0.005	0.479	0.524	0.006	0.000	0.000	5.011
194-2, mid-point	2.529	1.461	0.015	0.466	0.533	0.009	0.000	0.000	5.012
194-2, rim	2.556	1.446	0.007	0.434	0.544	0.012	0.000	0.000	4.999
208-1, core	2.589	1.410	0.009	0.401	0.579	0.013	0.000	0.000	5.002
208-1, mid-point	2.583	1.414	0.010	0.412	0.563	0.019	0.000	0.000	5.001
317-1, core A	2.533	1.464	0.010	0.450	0.524	0.015	0.000	0.000	5.005
317-1, core B	2.540	1.451	0.016	0.461	0.521	0.013	0.000	0.000	5.002
372A-3, core	2.540	1.461	0.008	0.439	0.554	0.010	0.000	0.000	5.012
372A-3, mid-point	2.655	1.335	0.008	0.329	0.641	0.019	0.000	0.000	4.997
372A-3, rim	2.704	1.299	0.005	0.278	0.699	0.022	0.000	0.000	5.007
377-1, core	2.690	1.303	0.004	0.302	0.667	0.020	0.000	0.009	4.994
377-1, step out	2.744	1.250	0.001	0.252	0.713	0.026	0.000	0.010	4.996
377-1, step out	2.792	1.200	0.005	0.195	0.774	0.025	0.000	0.009	5.000
377-1, step out	2.747	1.248	0.004	0.243	0.732	0.010	0.000	0.009	4.993
377-1, rim	2.886	1.108	0.007	0.106	0.861	0.021	0.000	0.005	4.994
642a-1, core	2.716	1.282	0.000	0.276	0.694	0.014	0.000	0.006	4.989
642a-1, mid-point	2.824	1.175	0.001	0.169	0.808	0.010	0.000	0.005	4.992
642a-1, rim	2.825	1.170	0.001	0.172	0.805	0.009	0.000	0.005	4.987
681-1, rim	2.565	1.425	0.005	0.438	0.543	0.016	0.000	0.006	4.999
681a-1, step in	2.550	1.437	0.005	0.457	0.526	0.012	0.000	0.006	4.992
681a-1, step in	2.565	1.424	0.005	0.431	0.556	0.008	0.000	0.006	4.995
681a-1, step in	2.574	1.417	0.006	0.437	0.530	0.012	0.000	0.008	4.983
681a-1, core	2.530	1.460	0.006	0.470	0.510	0.014	0.000	0.006	4.997
681a-4, core	2.506	1.490	0.002	0.497	0.489	0.000	0.000	0.008	4.992
681a-4, mid-point	2.582	1.403	0.004	0.430	0.552	0.009	0.000	0.008	4.987
681a-4, rim	2.529	1.461	0.006	0.469	0.509	0.009	0.000	0.006	4.990
681a gm 2	2.561	1.438	0.005	0.453	0.537	0.008	0.000	0.008	4.959
681a gm 3	2.569	1.419	0.004	0.440	0.538	0.008	0.000	0.006	4.985
687-1, rim	2.604	1.393	0.005	0.392	0.575	0.010	0.000	0.006	4.984
687-1, mid-point	2.590	1.402	0.004	0.414	0.560	0.012	0.000	0.008	4.989
687-1, core	2.574	1.411	0.006	0.425	0.567	0.016	0.000	0.006	5.005
687-3, core	2.522	1.477	0.005	0.467	0.498	0.012	0.000	0.008	4.988
687-3, step out	2.512	1.479	0.006	0.484	0.488	0.010	0.000	0.005	4.987
687-3, step out	2.570	1.418	0.005	0.433	0.548	0.010	0.000	0.008	4.992
687-3, rim	2.653	1.337	0.005	0.341	0.646	0.016	0.000	0.006	5.004
777b-2, core	2.507	*******	0.002	0.494	0.486	0.006	0.000	0.008	4.988
777b-2, rim	2.535	1.461	0.002	0.468	0.508	0.004	0.000	0.006	4.984
639-1A	2.296	1.698	0.004	0.705	0.268	0.004	0.000	0.006	4.981
639-1B	2.518	1.482	0.002	0.478	0.483	0.004	0.000	0.006	4.975
639-1C	2.386	1.616	0.002	0.603	0.361	0.004	0.000	0.008	4.979
639-4, ave.	2.502	1.490	0.002	0.499	0.487	0.008	0.000	0.006	4.996
638-1, ave.	2.631	1.363	0.001	0.376	0.598	0.018	0.000	0.002	4.989

TABLE 7. PLAGIOCLASE

Sample	SiO2	Al2O3	FeO	CaO	Na2O	K2O	TiO2	SrO	TOTAL
638-2, ave.	59.61	25.27	0.05	6.93	7.50	0.26	0.04	0.06	99.73
s186-4, rim	56.63	27.85	0.01	9.90	6.04	0.04	0.00	0.11	100.57
s186-4, step in	54.95	28.60	0.02	11.00	5.23	0.04	0.07	0.31	100.21
s186-4, step in	55.80	28.32	0.05	10.57	5.75	0.07	0.00	0.00	100.56
s186-4, step in	53.64	29.65	0.01	12.12	4.65	0.07	0.03	0.45	100.61
s186-4, step in	53.78	29.99	0.00	12.27	4.85	0.05	0.01	0.00	100.75
s186-4, core	54.92	28.65	0.00	10.98	5.36	0.07	0.02	0.16	100.16
s117-1, core	54.37	28.85	0.04	11.14	5.16	0.13	0.05	0.21	99.95
s117-1, step out	56.90	27.34	0.04	9.27	6.07	0.17	0.04	0.08	99.91
s117-1, step out	57.48	26.45	0.04	7.98	6.75	0.21	0.05	0.27	99.21
s117-1, rim	59.01	26.48	0.05	7.68	6.84	0.17	0.02	0.00	100.25
s117-3, core	53.52	29.51	0.01	11.43	4.64	0.13	0.04	0.15	99.43
s117-3, mid-poin	55.91	27.84	0.03	9.79	5.93	0.15	0.04	0.18	99.88
s117-3, rim	57.81	26.30	0.04	7.68	6.80	0.12	0.00	0.00	98.75
645a-1, ave.	53.82	29.52	0.11	11.44	4.52	0.21	0.01	0.02	99.65
645a-2, ave.	54.18	29.35	0.12	11.00	4.71	0.21	0.05	0.00	99.63
681b-3, core	55.55	28.72	0.10	10.39	5.45	0.07	0.00	0.22	100.05
681b-3, step out	55.47	28.36	0.14	10.24	5.55	0.09	0.00	0.00	99.84
681b-3, step out	55.73	28.15	0.11	10.00	5.56	0.10	0.00	0.00	99.65
681b-3, rim	56.38	27.30	0.17	9.11	6.09	0.18	0.00	0.00	99.23
681b gm ave.	57.20	26.99	0.19	8.76	6.38	0.17	0.02	0.08	99.77
686b-1, core	48.36	32.94	0.14	15.82	2.35	0.08	0.00	0.22	99.90
686b-1, outer cor	56.99	27.43	0.14	9.13	6.27	0.17	0.00	0.14	100.26
686b-1, near rim	56.33	27.71	0.05	9.46	6.07	0.10	0.04	0.00	99.77
686b-3, core	51.58	30.81	0.18	13.25	3.75	0.09	0.00	0.06	99.73
686b-3, mid-poin	55.86	27.88	0.13	9.41	5.88	0.19	0.04	0.17	99.57
686b-3, rim	57.29	2.69	0.16	8.55	6.34	0.21	0.05	0.18	99.68
686e-1, core	55.34	28.19	0.15	10.25	5.31	0.15	0.02	0.05	99.46
686e-1, step out	55.99	27.35	0.14	9.61	5.85	0.16	0.03	0.10	99.23
686e-1, step out	55.99	27.61	0.16	9.73	5.55	0.17	0.04	0.11	99.38
686e-1, rim	57.07	27.91	0.15	9.30	5.79	0.22	0.00	0.15	100.59
686e-1, rim	57.40	27.23	0.14	8.83	6.14	0.23	0.05	0.18	100.21
686e gm 2, rim	58.86	26.04	0.18	7.31	6.84	0.29	0.00	0.31	99.84
686e gm 2, core	56.40	27.55	0.14	9.13	5.95	0.21	0.02	0.12	99.60
775a-3, core	48.57	32.93	0.11	15.43	2.49	0.02	0.00	0.00	99.55
775a-3, mid-poin	54.20	28.89	0.04	10.67	5.10	0.06	0.00	0.04	99.01
775a-3, rim	49.07	32.89	0.10	15.20	2.62	0.05	0.04	0.30	100.29
775a gm, ave.	55.76	28.52	0.13	10.02	5.45	0.07	0.01	0.04	100.00
293-1, ave.	55.60	28.01	0.04	9.86	5.55	0.11	0.01	0.10	99.27
293-3, ave.	55.71	27.28	0.05	0.86	6.04	0.14	0.00	0.00	99.08
776-1, ave.	49.17	33.05	0.10	15.00	2.64	0.02	0.03	0.13	100.13
776 gm, ave.	50.48	32.21	0.11	14.35	3.17	0.01	0.03	0.02	100.38
771-2, core	54.32	28.84	0.04	10.95	5.16	0.04	0.00	0.07	99.42
771-2, rim	55.21	28.52	0.08	10.07	5.40	0.06	0.00	0.04	99.38
sliv-3, core	56.67	27.59	0.04	9.43	5.67	0.21	0.00	0.09	99.70
sliv-3, rim	57.19	27.30	0.07	8.70	6.30	0.11	0.00	0.07	99.74
s134-1, rim	57.93	26.26	0.12	7.94	6.71	0.26	0.05	0.16	99.43
s134-1, step in	58.33	26.56	0.09	8.05	6.66	0.28	0.04	0.25	100.25
s134-1, step in	56.38	27.76	0.11	9.10	5.96	0.24	0.00	0.23	99.80
s134-1, core	54.28	28.58	0.25	10.35	5.35	0.23	0.02	0.23	99.28
214b-1, ave.	47.05	33.72	0.10	17.11	1.79	0.11	0.00	0.02	99.98
214b-2, ave.	46.65	33.87	0.18	17.23	1.68	0.05	0.07	0.11	99.84
214b-3, ave.	47.54	33.43	0.14	16.65	2.06	0.02	0.01	0.06	99.90

TABLE 7. PLAGIOCLASE

Sample	Si	Al	Fe	Ca	Na	K	Ti	Sr	TOTAL
638-2, ave.	2.662	1.330	0.001	0.332	0.648	0.014	0.001	0.001	4.989
s185-4, rim	2.530	1.465	0.000	0.473	0.523	0.001	0.000	0.002	4.995
s186-4, step in	2.474	1.517	0.000	0.530	0.456	0.001	0.001	0.008	4.986
s186-4, step in	2.498	1.492	0.001	0.505	0.498	0.004	0.000	0.000	4.999
s186-4, step in	2.417	1.575	0.000	0.584	0.406	0.004	0.000	0.010	4.996
s186-4, step in	2.413	1.585	0.000	0.589	0.404	0.002	0.000	0.000	4.993
s186-4, core	2.471	1.520	0.000	0.529	0.467	0.004	0.000	0.004	4.995
s117-1, core	2.456	1.535	0.001	0.538	0.452	0.006	0.001	0.005	4.994
s117-1, step out	2.552	1.445	0.001	0.445	0.527	0.009	0.001	0.001	4.980
s117-1, step out	2.593	1.406	0.001	0.384	0.590	0.012	0.001	0.006	4.993
s117-1, rim	2.624	1.387	0.001	0.365	0.589	0.009	0.000	0.000	4.975
s117-3, core	2.428	1.577	0.000	0.555	0.427	0.006	0.001	0.004	4.979
s117-3, mid-point	2.517	1.477	0.000	0.472	0.518	0.008	0.001	0.004	4.996
s117-3, rim	2.612	1.400	0.001	0.371	0.595	0.006	0.000	0.000	4.985
645a-1, ave.	2.436	1.574	0.004	0.554	0.396	0.012	0.000	0.000	4.974
645a-2, ave.	2.448	1.563	0.004	0.532	0.412	0.012	0.001	0.000	4.971
681b-3, core	2.488	1.515	0.002	0.498	0.473	0.004	0.000	0.005	4.985
681b-3, step out	2.498	1.505	0.004	0.493	0.483	0.004	0.000	0.000	4.986
681b-3, step out	2.510	1.494	0.004	0.462	0.485	0.005	0.000	0.000	4.980
681b-3, rim	2.549	1.454	0.005	0.440	0.533	0.009	0.000	0.000	4.991
681b gm ave.	2.569	1.429	0.006	0.420	0.555	0.009	0.000	0.001	4.989
686b-1, core	2.216	1.779	0.004	0.776	0.208	0.004	0.000	0.005	4.993
686b-1, outer core	2.552	1.447	0.005	0.438	0.544	0.009	0.000	0.002	4.996
686b-1, near rim	2.532	1.458	0.001	0.455	0.527	0.005	0.001	0.000	4.989
686b-3, core	2.347	1.651	0.006	0.646	0.331	0.005	0.000	0.001	4.988
686b-3, mid-point	2.521	1.483	0.004	0.454	0.514	0.010	0.001	0.004	4.991
686b-3, rim	2.576	1.425	0.005	0.412	0.551	0.012	0.001	0.004	4.985
686e-1, core	2.503	1.502	0.005	0.596	0.464	0.008	0.000	0.001	4.979
686e-1, step out	2.537	1.459	0.004	0.466	0.513	0.008	0.000	0.001	4.988
686e-1, step out	2.529	1.470	0.005	0.470	0.485	0.009	0.001	0.002	4.972
686e-1, step out	2.542	1.465	0.005	0.443	0.499	0.012	0.000	0.004	4.970
686e-1, rim	2.567	1.435	0.005	0.422	0.533	0.012	0.001	0.004	4.978
686e gm 2, rim	2.634	1.372	0.006	0.349	0.593	0.016	0.000	0.008	4.979
686e gm 3, core	2.544	1.461	0.004	0.440	0.519	0.012	0.000	0.002	4.982
775a-3, core	2.226	1.779	0.004	0.757	0.220	0.000	0.000	0.000	4.986
775a-3, mid-point	2.463	1.547	0.001	0.519	0.449	0.002	0.000	0.000	4.981
775a-3, rim	2.235	1.766	0.002	0.742	0.231	0.002	0.001	0.006	4.986
775a gm, ave.	2.504	1.509	0.004	0.482	0.473	0.002	0.000	0.000	4.974
293-1, ave.	2.514	1.492	0.001	0.478	0.485	0.005	0.000	0.002	4.977
293-3, ave.	2.560	1.450	0.001	0.428	0.527	0.006	0.000	0.000	4.972
776-1, ave.	2.241	1.774	0.002	0.731	0.232	0.000	0.000	0.002	4.983
776 gm, ave.	2.288	1.720	0.004	0.695	0.278	0.000	0.000	0.000	4.984
771-2, core	2.461	1.540	0.001	0.530	0.453	0.001	0.000	0.001	4.987
771-2, rim	2.496	1.519	0.002	0.486	0.472	0.002	0.000	0.000	4.977
s1iv-3, core	2.548	1.461	0.001	0.454	0.493	0.012	0.000	0.001	4.968
s1iv-3, rim	2.566	1.443	0.001	0.417	0.547	0.005	0.000	0.001	4.980
s134-1, rim	2.606	1.392	0.004	0.383	0.584	0.014	0.001	0.004	4.988
s134-1, step in	2.605	1.396	0.002	0.384	0.576	0.016	0.001	0.005	4.985
s134-1, step in	2.536	1.472	0.004	0.438	0.519	0.013	0.000	0.005	4.986
s134-1, core	2.469	1.532	0.009	0.504	0.471	0.013	0.000	0.005	5.003
214b-1, ave.	2.162	1.826	0.006	0.842	0.159	0.005	0.000	0.000	5.001
214b-2, ave.	2.149	1.838	0.006	0.850	0.150	0.002	0.001	0.002	4.999
214b-3, ave.	2.184	1.809	0.005	0.818	0.183	0.000	0.000	0.001	5.000

TABLE 7. PLAGIOCLASE

Sample	SiO2	Al2O3	FeO	CaO	Na2O	K2O	TiO2	SrO	TOTAL
133-1, ave.	54.76	28.29	0.17	10.66	5.12	0.29	0.00	0.10	99.38
133-2, ave.	54.85	28.26	0.17	10.45	5.22	0.29	0.00	0.08	99.32
133-3, ave.	55.59	28.11	0.17	10.20	5.38	0.26	0.01	0.04	99.77
219a-1, ave.	54.92	28.78	2.12	10.63	5.28	0.07	0.00	0.04	99.83
219a-3, ave.	55.31	28.36	0.17	10.20	5.66	0.07	0.00	0.13	99.91
219a-4, core	47.41	34.29	0.11	16.40	1.79	0.01	0.05	0.08	100.14
219a-4, step out	54.82	29.33	0.08	11.07	5.17	0.04	0.00	0.09	100.60
219a-4, step out	54.15	29.74	0.05	11.41	4.76	0.04	0.03	0.00	100.18
219a-4, rim	56.60	27.98	0.14	9.31	5.98	0.08	0.07	0.00	100.15
179-1, ave.	54.63	29.11	0.08	10.65	4.99	0.21	0.01	0.09	99.78
179-2, ave.	55.72	27.69	0.08	9.73	5.77	0.29	0.00	0.10	99.37
179 gm, ave.	54.99	28.40	0.07	10.76	5.14	0.29	0.01	0.05	99.80
119-1, ave.	55.90	27.98	0.07	9.69	6.01	0.07	0.00	0.12	99.84
119-4, ave.	56.12	28.06	0.05	9.47	6.14	0.07	0.03	0.05	99.99
7B-1, incl,gt	48.29	32.93	0.15	16.11	2.15	0.03	0.02	0.13	99.80
7B-2, incl,gt	47.45	33.02	0.11	16.51	1.88	0.03	0.00	0.03	99.03
7B-5, rim	53.14	29.91	0.05	12.36	4.51	0.04	0.05	0.07	100.13
7B-5, core	54.91	28.26	0.04	10.41	5.48	0.04	0.00	0.30	99.44

TABLE 7. PLAGIOCLASE

Sample	Si	Al	Fe	Ca	Na	K	Ti	Sr	TOTAL
133-1, ave.	2.485	1.513	0.005	0.518	0.450	0.016	0.000	0.001	4.985
133-2, ave.	2.487	1.510	0.005	0.507	0.459	0.016	0.000	0.001	4.985
133-3, ave.	2.507	1.494	0.005	0.492	0.470	0.014	0.000	0.000	4.982
219a-1, ave.	2.477	1.530	0.004	0.513	0.460	0.002	0.000	0.000	4.987
219a-3, ave.	2.493	1.506	0.005	0.492	0.494	0.004	0.000	0.002	4.996
219a-4, core	2.167	1.846	0.004	0.802	0.157	0.000	0.001	0.001	4.977
219a-4, step out	2.457	1.549	0.002	0.531	0.448	0.001	0.000	0.001	4.989
219a-4, step out	2.436	1.575	0.001	0.549	0.415	0.001	0.000	0.000	4.978
219a-4, rim	2.532	1.474	0.004	0.446	0.518	0.004	0.001	0.000	4.979
179-1, ave.	2.465	1.547	0.002	0.515	0.435	0.012	0.000	0.001	4.977
179-2, ave.	2.521	1.476	0.002	0.471	0.506	0.016	0.000	0.001	4.994
179 gm, ave.	2.483	1.516	0.002	0.520	0.449	0.016	0.000	0.001	4.987
119-1, ave.	2.516	1.484	0.001	0.466	0.524	0.002	0.000	0.002	4.997
119-4, ave.	2.520	1.485	0.001	0.455	0.534	0.002	0.000	0.001	4.997
7B-1, incl,gt	2.216	1.780	0.005	0.792	0.189	0.001	0.000	0.002	4.986
7B-2, incl,gt	2.194	1.799	0.004	0.818	0.168	0.001	0.200	0.000	4.983
7B-5, rim	2.399	1.591	0.001	0.597	0.395	0.001	0.001	0.001	4.986
7B-5, core	2.487	1.509	0.001	0.505	0.479	0.001	0.000	0.008	4.990

TABLE 8.
WCB K-feldspar

SPL	XTAL	SiO2	Al2O3	FeO	CaO	Na2O	K2O	SrO	BaO	ZnO	TOTAL
317	KS1c	64.14	18.69	0.25	0.00	1.42	14.19	0.00	1.28	0.00	99.98
317	KS1i	63.01	18.82	0.36	0.00	1.21	14.11	0.00	1.72	0.00	99.23
317	KS1r	64.78	18.65	0.32	0.00	1.37	14.18	0.00	1.34	0.00	100.64
317	KS2c	65.76	18.20	0.20	0.00	1.06	14.98	0.00	0.24	0.00	100.43
317	KS2r	65.26	18.14	0.19	0.00	1.00	14.79	0.00	0.15	0.00	99.80
317	ks1nav	64.83	18.48	0.09	0.00	0.80	15.64	0.00	0.13	0.06	100.03
317	ks2nav	64.95	18.40	0.06	0.00	0.90	15.48	0.00	0.14	0.01	99.94
194	KS1r	64.84	18.55	0.05	0.00	1.15	14.68	0.00	1.07	0.00	100.34
194	KS1c	65.10	18.41	0.07	0.00	1.25	14.51	0.00	1.01	0.00	100.34
208	KS1	65.24	18.14	0.28	0.00	0.82	15.18	0.00	0.41	0.00	100.06
372A	KS2	64.31	18.68	0.26	0.00	1.72	13.45	0.00	1.80	0.00	100.21
372A	ks1nav	65.46	18.53	0.04	0.01	1.48	14.53	0.00	0.07	0.03	100.16
377	ks1av	65.10	18.30	0.09	0.03	1.52	14.50	0.00	0.16	0.04	99.75
377	ks2av	64.18	18.77	0.09	0.07	2.57	12.21	0.00	1.89	0.03	99.82
579	ks1a	64.24	18.74	0.01	0.08	2.13	12.58	0.00	2.23	0.00	100.01
579	ks1c	63.99	18.80	0.04	0.04	1.63	0.79	0.00	0.04	0.00	99.95
579	ks1d	64.83	18.69	0.04	0.04	1.23	14.29	0.00	1.03	0.00	100.16
579	ks1e	65.48	18.25	0.02	0.00	0.50	15.61	0.00	0.11	0.05	100.02
579	ks1av	64.64	18.62	0.03	0.04	1.37	10.82	0.00	0.85	0.01	100.04
579	ks2av	65.38	18.30	0.04	0.02	1.39	14.40	0.00	0.14	0.02	99.70
579	ks3av	65.07	18.41	0.03	0.01	1.38	14.37	0.00	0.09	0.04	99.40
642A	ks1av	63.71	18.77	0.01	0.03	1.13	14.20	0.00	1.71	0.02	99.59
642A	ks2av	64.41	18.59	0.01	0.03	1.58	13.64	0.00	0.90	0.06	99.22
642A	ks3av	63.66	18.73	0.00	0.02	1.01	14.27	0.00	1.55	0.03	99.27
471	ks1av	63.92	19.02	0.05	0.05	1.79	13.32	0.00	2.11	0.02	100.29
471	ks2av	64.03	18.74	0.07	0.04	1.61	13.91	0.00	1.48	0.00	99.88
471	ks3av	65.69	18.57	0.04	0.04	1.89	14.20	0.00	0.15	0.01	100.57
687	ks1av	64.76	18.32	0.10	0.03	1.11	15.23	0.00	0.05	0.05	99.64
687	ks2av	63.26	18.68	0.04	0.04	1.12	14.45	0.00	1.57	0.01	99.17
687	ks3av	63.69	18.80	0.04	0.04	1.24	14.25	0.00	1.86	0.03	99.94

TABLE 8.

WCB K-feldspar

SPL	XTAL	Si	Al	Fe	Ca	Na	K	Sr	Ba	Zn	TOTAL
317	KS1c	2.975	1.022	0.010	0.000	0.128	0.840	0.000	0.023	0.000	4.998
317	KS1i	2.957	1.041	0.014	0.000	0.110	0.845	0.000	0.032	0.000	5.000
317	KS1r	2.984	1.012	0.012	0.000	0.123	0.833	0.000	0.024	0.000	4.988
317	KS2c	3.014	0.983	0.007	0.000	0.094	0.876	0.000	0.004	0.000	4.979
317	KS2r	3.006	0.999	0.007	0.000	0.089	0.869	0.000	0.003	0.000	4.974
317	ks1nav	2.993	1.005	0.002	0.000	0.070	0.921	0.000	0.001	0.001	4.993
317	ks2nav	2.997	1.000	0.001	0.000	0.080	0.910	0.000	0.001	0.000	4.988
194	KS1r	2.991	1.009	0.002	0.000	0.103	0.864	0.000	0.020	0.000	4.988
194	KS1c	2.999	0.999	0.003	0.000	0.112	0.852	0.000	0.018	0.000	4.983
208	KS1	3.010	0.986	0.011	0.000	0.073	0.893	0.000	0.007	0.000	4.980
372A	KS2	2.977	1.019	0.010	0.000	0.154	0.794	0.000	0.033	0.000	4.987
372A	ks1nav	3.001	1.000	0.001	0.000	0.130	0.849	0.000	0.000	0.000	4.981
377	ks1av	3.001	0.994	0.002	0.001	0.135	0.852	0.000	0.002	0.000	4.987
377	ks2av	2.972	1.024	0.002	0.002	0.231	0.720	0.000	0.034	0.000	4.986
579	ks1a	2.977	1.022	0.000	0.002	0.190	0.742	0.000	0.039	0.000	4.973
579	ks1c	2.970	1.028	0.001	0.001	0.146	0.791	0.000	0.037	0.000	4.973
579	ks1d	2.987	1.014	0.001	0.001	0.109	0.840	0.000	0.018	0.000	4.970
579	ks1e	3.014	0.990	0.000	0.000	0.043	0.916	0.000	0.001	0.001	4.964
579	ks1av	2.987	1.014	0.001	0.001	0.122	0.822	0.000	0.024	.000	4.970
579	ks2av	3.009	0.993	0.001	0.000	0.123	0.845	0.000	0.001	0.000	4.972
579	ks3av	3.003	1.001	0.000	0.000	0.123	0.845	0.000	0.001	0.000	4.973
642A	ks1av	2.971	1.032	0.000	0.001	0.101	0.844	0.000	0.030	0.000	4.979
642A	ks2av	2.989	1.016	0.000	0.000	0.142	0.808	0.000	0.016	0.001	4.971
642A	ks3av	2.976	1.031	0.000	0.000	0.090	0.851	0.000	0.027	0.000	4.975
471	ks1av	2.961	1.039	0.001	0.001	0.160	0.787	0.000	0.038	0.000	4.987
471	ks2av	2.973	1.024	0.002	0.001	0.144	0.823	0.000	0.026	0.000	4.994
471	ks3av	2.997	0.997	0.001	0.001	0.166	0.826	0.000	0.001	0.000	4.988
687	ks1av	2.997	0.999	0.002	0.000	0.099	0.898	0.000	0.000	0.001	4.996
687	ks2av	2.966	1.032	0.001	0.001	0.102	0.864	0.000	0.029	0.000	4.994
687	ks3av	2.966	1.032	0.001	0.001	0.112	0.846	0.000	0.033	0.000	4.990

TABLE 8.
WCB K-feldspar

SPL	XTAL	SiO2	Al2O3	FeO	CaO	Na2O	K2O	SrO	BaO	ZnO	TOTAL
317	KS1c	64.14	18.69	0.25	0.00	1.42	14.19	0.00	1.28	0.00	99.98
317	KS1i	63.01	18.82	0.36	0.00	1.21	14.11	0.00	1.72	0.00	99.23
317	KS1r	64.78	18.65	0.32	0.00	1.37	14.18	0.00	1.34	0.00	100.64
317	KS2c	65.76	18.20	0.20	0.00	1.06	14.98	0.00	0.24	0.00	100.43
317	KS2r	65.26	18.14	0.19	0.00	1.00	14.79	0.00	0.15	0.00	99.80
317	ks1nav	64.83	18.48	0.09	0.00	0.80	15.64	0.00	0.13	0.06	100.03
317	ks2nav	64.95	18.40	0.06	0.00	0.90	15.48	0.00	0.14	0.01	99.94
194	KS1r	64.84	18.55	0.05	0.00	1.15	14.68	0.00	1.07	0.00	100.34
194	KS1c	65.10	18.41	0.07	0.00	1.25	14.51	0.00	1.01	0.00	100.34
208	KS1	65.24	18.14	0.28	0.00	0.82	15.18	0.00	0.41	0.00	100.06
372A	KS2	64.31	18.68	0.26	0.00	1.72	13.45	0.00	1.80	0.00	100.21
372A	ks1nav	65.46	18.53	0.04	0.01	1.48	14.53	0.00	0.07	0.03	100.16
377	ks1av	65.10	18.30	0.09	0.03	1.52	14.50	0.00	0.16	0.04	99.75
377	ks2av	64.18	18.77	0.09	0.07	2.57	12.21	0.00	1.89	0.03	99.82
579	ks1a	64.24	18.74	0.01	0.08	2.13	12.58	0.00	2.23	0.00	100.01
579	ks1c	63.99	18.80	0.04	0.04	1.63	0.79	0.00	0.04	0.00	99.95
579	ks1d	64.83	18.69	0.04	0.04	1.23	14.29	0.00	1.03	0.00	100.16
579	ks1e	65.48	18.25	0.02	0.00	0.50	15.61	0.00	0.11	0.05	100.02
579	ks1av	64.64	18.62	0.03	0.04	1.37	10.82	0.00	0.85	0.01	100.04
579	ks2av	65.38	18.30	0.04	0.02	1.39	14.40	0.00	0.14	0.02	99.70
579	ks3av	65.07	18.41	0.03	0.01	1.38	14.37	0.00	0.09	0.04	99.40
642A	ks1av	63.71	18.77	0.01	0.03	1.13	14.20	0.00	1.71	0.02	99.59
642A	ks2av	64.41	18.59	0.01	0.03	1.58	13.64	0.00	0.90	0.06	99.22
642A	ks3av	63.66	18.73	0.00	0.02	1.01	14.27	0.00	1.55	0.03	99.27
471	ks1av	63.92	19.02	0.05	0.05	1.79	13.32	0.00	2.11	0.02	100.29
471	ks2av	64.03	18.74	0.07	0.04	1.61	13.91	0.00	1.48	0.00	99.88
471	ks3av	65.69	18.57	0.04	0.04	1.89	14.20	0.00	0.15	0.01	100.57
687	ks1av	64.76	18.32	0.10	0.03	1.11	15.23	0.00	0.05	0.05	99.64
687	ks2av	63.26	18.68	0.04	0.04	1.12	14.45	0.00	1.57	0.01	99.17
687	ks3av	63.69	18.80	0.04	0.04	1.24	14.25	0.00	1.86	0.03	99.94

TABLE 8.

WCB K-feldspar, continued.

SPL	XTAL	Si	Al	Fe	Ca	Na	K	Sr	Ba	Zn	TOTAL
317	KS1c	2.975	1.022	0.010	0.000	0.128	0.840	0.000	0.023	0.000	4.998
317	KS1i	2.957	1.041	0.014	0.000	0.110	0.845	0.000	0.032	0.000	5.000
317	KS1r	2.984	1.012	0.012	0.000	0.123	0.833	0.000	0.024	0.000	4.988
317	KS2c	3.014	0.983	0.007	0.000	0.094	0.876	0.000	0.004	0.000	4.979
317	KS2r	3.006	0.999	0.007	0.000	0.089	0.869	0.000	0.003	0.000	4.974
317	ks1nav	2.993	1.005	0.002	0.000	0.070	0.921	0.000	0.001	0.001	4.993
317	ks2nav	2.997	1.000	0.001	0.000	0.080	0.910	0.000	0.001	0.000	4.988
194	KS1r	2.991	1.009	0.002	0.000	0.103	0.864	0.000	0.020	0.000	4.988
194	KS1c	2.999	0.999	0.003	0.000	0.112	0.852	0.000	0.018	0.000	4.983
208	KS1	3.010	0.986	0.011	0.000	0.073	0.893	0.000	0.007	0.000	4.980
372A	KS2	2.977	1.019	0.010	0.000	0.154	0.794	0.000	0.033	0.000	4.987
372A	ks1nav	3.001	1.000	0.001	0.000	0.130	0.849	0.000	0.000	0.000	4.981
377	ks1av	3.001	0.994	0.002	0.001	0.135	0.852	0.000	0.002	0.000	4.987
377	ks2av	2.972	1.024	0.002	0.002	0.231	0.720	0.000	0.034	0.000	4.986
579	ks1a	2.977	1.022	0.000	0.002	0.190	0.742	0.000	0.039	0.000	4.973
579	ks1c	2.970	1.028	0.001	0.001	0.146	0.791	0.000	0.037	0.000	4.973
579	ks1d	2.987	1.014	0.001	0.001	0.109	0.840	0.000	0.018	0.000	4.970
579	ks1e	3.014	0.990	0.000	0.000	0.043	0.916	0.000	0.001	0.001	4.964
579	ks1av	2.987	1.014	0.001	0.001	0.122	0.822	0.000	0.024	.000	4.970
579	ks2av	3.009	0.993	0.001	0.000	0.123	0.845	0.000	0.001	0.000	4.972
579	ks3av	3.003	1.001	0.000	0.000	0.123	0.845	0.000	0.001	0.000	4.973
642A	ks1av	2.971	1.032	0.000	0.001	0.101	0.844	0.000	0.030	0.000	4.979
642A	ks2av	2.989	1.016	0.000	0.000	0.142	0.808	0.000	0.016	0.001	4.971
642A	ks3av	2.976	1.031	0.000	0.000	0.090	0.851	0.000	0.027	0.000	4.975
471	ks1av	2.961	1.039	0.001	0.001	0.160	0.787	0.000	0.038	0.000	4.987
471	ks2av	2.973	1.024	0.002	0.001	0.144	0.823	0.000	0.026	0.000	4.994
471	ks3av	2.997	0.997	0.001	0.001	0.166	0.826	0.000	0.001	0.000	4.988
687	ks1av	2.997	0.999	0.002	0.000	0.099	0.898	0.000	0.000	0.001	4.996
687	ks2av	2.966	1.032	0.001	0.001	0.102	0.864	0.000	0.029	0.000	4.994
687	ks3av	2.966	1.032	0.001	0.001	0.112	0.846	0.000	0.033	0.000	4.990