PETROGENESIS OF MOUNT DORE-STYLE BRECCIA-HOSTED COPPER ± GOLD MINERALIZATION IN THE KURIDALA-SELWYN REGION OF NORTHWESTERN QUEENSLAND

(VOLUME 2 - APPENDICES)

Thesis submitted by

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APPENDICES (VOLUME 2)

APPENDIX A

THE NEW MARONAN SUPERGROUP - SOME DEFINITIONS, AND IMPLICATIONS FOR STRATIGRAPHIC REVISION IN THE CLONCURRY FOLD BELT, NORTHWEST QUEENSLAND

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SUMMARY

Structural and lithological mapping in the Cloncurry fold belt has revealed a major discrete volcanosedimentary basin sequence, which is defined as the Maronan Supergroup. This incorporates, from the base, the Fullarton River Group, subdivided into the Gandry Dam Gneiss, Glen Idol Schist and New Hope Arkose, and the Soldiers Cap Group of Derrick *et al.* (1976e), which has been expanded to incorporate a large proportion of the sediments of the obsolete Kuridala Formation. The Mary Kathleen Group is revised accordingly. The sequence is internally conformable. The base of the Maronan Supergroup is not exposed and boundaries with other major stratigraphic units are tectonic. The Maronan Supergroup may contain some of the oldest sediments in the Mount Isa Inlier, deposited between 1865 and 1810 Ma.

INTRODUCTION

Systematic mapping of the Mount Isa Inlier by the Bureau of Mineral Resources (BMR) and Geological Survey of Queensland (GSQ) between 1950 and 1958 established the basic stratigraphy upon which all subsequent work has relied (Carter *et al.*, 1961). This work was updated between 1969 and 1977 by these same organizations, and reported in a series of papers by Derrick *et al.* (1976a-e; 1977a,b; 1978). During this time, previously established units were revised, and many new ones, at all ranks, were defined.

The western part of the Mount Isa Inlier has historically received more attention, because of its proven economic potential. The eastern part is less well studied and understood, and contains rocks of the highest metamorphic grade and structural complexity. It contains important deposit styles unique in the Mount Isa Inlier, such as the Pegmont-style BIF-related stratiform Pb+Zn, Starra replacement ironstone-hosted Au+Cu, and Cloncurry-style transgressive Cu+Au deposits. Metallogenic studies of these deposits have, however, been hampered by poor understanding of the stratigraphic and tectonic histories of this part of the inlier. To address these shortcomings, we have continued the work of the BMR and GSQ in the eastern part of the Mount Isa Inlier, here termed the Cloncurry fold belt, mapping in detail the following parts (Figure 1).

(1) The eastern margin: metasediments classified as undifferentiated Soldiers Cap Group, from the southern limit of the undifferentiated group (21°20'S; Sandy Creek), to the limit of outcrop 100 kilometres south (22°S; Pegmont); and

(2) The central and southern part: metasediments of the Kuridala and Staveley Formations, and gneisses of the Double Crossing Metamorphics and Gin Creek Granite.

The purpose of this report is to present formal definitions for new units recognised during this mapping, and to suggest revisions to the established ones.

The previously fragmentary stratigraphic picture is now recognised as several coherent lithostratigraphic packages, which group conformably into a major regional sequence, extending the length of the Cloncurry fold belt. Five new units are defined. The **Gandry Dam Gneiss**, **Glen Idol Schist** and **New Hope Arkose** have formation status, and all belong to the **Fullarton River Group**, which is the oldest group in the **Maronan Supergroup**. The previously-defined Soldiers Cap Group (Derrick *et al.*, 1976e) conformably overlies the Fullarton River Group, and has been expanded to incorporate most of the Kuridala Formation of Carter *et al.* (1961). The remainder of the Kuridala Formation is consigned to the New Hope Arkose, with the former name thereby rendered obsolete, to be removed from the Mary Kathleen Group.

The regional implications the Maronan Supergroup has for the tectonostratigraphic development of the Mount Isa Inlier are considered in the complementary publication by Beardsmore *et al.* (1988).

DEFINITION OF THE GANDRY DAM GNEISS

Proposed name: Gandry Dam Gneiss.

Derivation of name: Gandry Dam waterhole, 83 kilometres south-south-east of Cloncurry. lat.21°19'55"S, long.140°56'55"E (54K VB947410).

Distribution: The Gandry Dam Gneiss crops out as a series of discontinuous elliptical bodies along the eastern margin of the central Williams Batholith. Distribution is tectonically controlled, being restricted to the cores of F_2 antiforms. The main areas of outcrop occur around Gandry Dam (54K VB947410), Boorama Tank (54K VB842329) and Blackrock (54K VA910080)(Figure 1), and cover an area of about 200 km^2. The Gandry Dam Gneiss is the main lithological component of a thrust slice that dominates the eastern edge of outcrop (Figure 1).

Type section: The type section of the Gandry Dam Gneiss is a 5 km traverse, and covers the interpreted stratigraphic sequence for the unit as far as outcrop permits. The stratigraphic base of the unit is not exposed.

The traverse progresses east from 54K VB894422 to 54K VB937429. The inferred stratigraphic top of the succession is characterised by 50 to 100 m of thickly bedded, magnetic garnet-sillimanite-biotite-plagioclase-microcline-quartz gneiss interpreted as possible felsic metavolcanics, with minor garnet-bearing amphibolite, BIF, quartzite and sillimanite-K-feldspar migmatite. This is underlain by 200 m of sub-cropping bedded, magnetitic sillimanite-bearing gneiss and a further 200 m of strongly crenulated pelitic sillimanite-bearing gneiss and interbedded magnetite- and garnet-bearing quartzofeldspathic gneiss. Down-sequence is poorly outcropping, sub-migmatitic gahnite quartzite, calc-silicate and amphibolite, with minor BIF, along the Gandry stream section.

Regionally, a prominent iron formation horizon, which includes the Maramungee-Blackrock and Gidya Tank iron formations occurs just below the stratigraphic boundary with the overlying Glen Idol Schist. This is correlated with the top of the Gandry Dam sequence.

Lithology: Quartzofeldspathic schist, gneiss and migmatite, blue quartzite, garnet pelite, gahnite quartzite, BIF, calc-silicate schist and gneiss (brecciated in parts), pegmatite and amphibolite.

Thickness: The minimum stratigraphic thickness for this unit is 2000 m. Fold repetition may give a greater apparent thickness, and the stratigraphic base is not exposed.

Stratigraphic Relations: The oldest rock unit in the Maronan Supergroup is Gandry Dam Gneiss cropping out in the core of the D_2-age Bulls Creek Antiform (Figure 1). Most contacts between Gandry Dam Gneiss and other units are tectonic (e.g. with Glen Idol Schist and Llewellyn Creek Formation around the Yellow Tank Antiform), but it is conformable beneath the Glen Idol Schist in the area of 54K VB860445 (Figure 1). Here, the boundary is exposed at the base of the Glen Idol type section, and is marked by an abrupt transition into coarse, pegmatite-rich feldspathic schists. To the south, the Gandry Dam Gneiss is tectonically overlain by the calc-silicate rocks of the Doherty Formation (Figure 1).

The Gandry Dam Gneiss may be correlative with the Double Crossing Metamorphics of the Gin Creek Block (Figure 1).

Topography: Flat, featureless terrain, with rare outcrop as isolated low, rounded knolls.

Remarks: The Gandry Dam Gneiss is part of previously undifferentiated Soldiers Cap Group.

DEFINITION OF THE GLEN IDOL SCHIST

Proposed name: Glen Idol Schist.

Derivation of name: Glen Idol Station, 70 km south-south-east of Cloncurry. lat.21^{o}16'20"S, long.140^{o}48'25"E (54K VB799476).

Distribution: The Glen Idol Schist crops out sporadically over approximately 90 km^2 (Figure 1). Distribution is strongly influenced by thrust repetition. The most extensive outcrop is near Glen Idol Homestead (54K VB799476), and to the south of Fairmile (54K VB840520). The southern extension of the Glen Idol Schist has been defined using airphoto and image processed aeromagnetic data in conjunction with detailed ground surveys.

Type section: The proposed type section comprises two separate traverses (Figure 1). The first is 1500 m long, and progresses west from 54K VB860455 to 54K VB848450 (in the Fairmile Synform). The base of the section is marked by an abrupt transition from the flat plain of the quartzofeldspathic gneisses and migmatites of the Gandry Dam Gneiss to prominent ridges of thickly bedded, coarse-grained quartzofeldspathic schist, feldspathic psammite and pegmatite. A prominent unit rich in knotted sillimanite porphyryoblasts is subjacent to this lower contact. Complex folding late in the deformation history has caused minor repetition of the stratigraphy along this traverse. The estimated true thickness of this part of the type section is 800 m, and it represents the lowermost portion of the Glen Idol Schist.

The second traverse is from 54K VB855660, approximately 1500 m west to 54K VB840655. The succession is lithologically similar to that along traverse 1, but includes a magnetic gneiss and ortho-amphibolite horizon, interpreted to be the uppermost part of the Glen Idol Schist.

Lithology: Quartzofeldspathic schists with distinctive leucosomes, feldspathic psammite, minor composite gneiss, pegmatite and strongly magnetic amphibolite bodies

Thickness: The formation is at least 1800 m thick with a possible maximum of 3000 m.

Stratigraphic Relations: The Glen Idol Schist conformably overlies the Gandry Dam Gneiss, and is conformably and gradationally overlain by the Llewellyn Creek Formation of the Soldiers Cap Group. The contact with Llewellyn Creek Formation is marked by thinly-bedded turbiditic sediments characterised by sillimanite porphyroblasts. Along the western margin of the Soldiers Cap Belt, the Glen Idol Schist is tectonically overlain by the Doherty Formation (54K VB815278). The Glen Idol Schist is probably a time correlative of the New Hope Arkose to the west.

Topography: Prominent north-south strike ridges, with a rugged, bouldery form.

Remarks: The Glen Idol Schist was previously grouped with undifferentiated Soldiers Cap Group, but is now interpreted as the uppermost stratigraphic unit of the Fullarton River Group.

DEFINITION OF THE NEW HOPE ARKOSE

Proposed name: New Hope Arkose.

Derivation of name: New Hope scheelite mine, 115 km south of Cloncurry. lat.21°43'39"S, long.140°29'37"E (54K VA477971).

Distribution: The New Hope Arkose crops out in two near-elliptical pods in fold cores in the Mort River area, approximately 110 to 120 km due south of Cloncurry. The largest of these is about 10 km long and 3 km wide, with the long axis trending north-south. The smaller pod lies 5 km further east, and is about 1000 by 800 m in size. The southern margins of both bodies are truncated by the Yellow Waterhole Granite, a pluton of the Williams Batholith (see Figure 1).

Type section: The type section for this unit is from 54K VA493995 to 54K VA502995. The section is mostly a monotonous sequence of thick-bedded (1 to 2 m), internally structureless, medium- to coarse-grained quartzofeldspathic psammite (metamorphosed quartz-rich arkose), with dispersed minor interbeds up to 20 cm thick of strongly foliated staurolite-bearing schist.

Lithology: Thinly to thickly bedded, feldspathic psammite with minor interbedded pelite horizons. Some of the latter are staurolite-bearing.

Thickness: Probably about 1000 m; may be overestimated due to structural repetition. The base is not exposed.

Stratigraphic Relations: Grades conformably into the Llewellyn Creek Formation (lowermost unit in the Soldiers Cap Group). The transition is marked by a drastic thinning of beds (from greater than 1 m to less than 30 cm), loss of feldspar, and an increase in the abundance of pelitic beds. The New Hope Arkose is interpreted to be stratigraphically equivalent to the Glen Idol Schist.

Topography: Steep, closely-spaced, north-trending ridges with up to 50 m relief.

Remarks: The New Hope Arkose was considered by BMR workers (Blake *et al.*, 1983) to be a discrete unit of indeterminate stratigraphic position within the Kuridala Formation.

DEFINITION OF THE FULLARTON RIVER GROUP

Proposed name: Fullarton River Group.

Derivation of name: Fullarton River (Kuridala 1:100000 Geological Special Sheet, northeast corner).

Constituent Formations: The Fullarton River Group consists of the Gandry Dam Gneiss, Glen Idol Schist and New Hope Arkose. The latter two formations are thought to be lateral equivalents, and younger than the Gandry Dam Gneiss.

Distribution: The Fullarton River Group crops out over a total area of 1300 km^2. The most extensive development occurs within the eastern Fairmile belt, with the Gandry Dam Gneiss and the Glen Idol Schist. Outcrop in the western Selwyn belt consists of New Hope Arkose only. Gravity and image-processed aeromagnetic data also indicate these metasediments extend east and south, at depth, beneath the Eromanga Basin.

Type Section: The type section for the Fullarton River Group is composite, consisting of type sections outlined for its constituent formations.

Lithology: Quartzofeldspathic migmatite-composite gneiss-schist, feldspathic psammite, calc-silicate schist and gneiss, garnet pelite, blue quartzite, BIF, gahnite quartzite, para- and orthoamphibolite and pegmatite swarms.

Thickness: At least 3800 m.

Stratigraphic Relations: The base of the Fullarton River Group is not evident from current mapping. Tectonic disruption has resulted in multiple repetition of the stratigraphic sequence (Figure 1). The group is overlain conformably by the Soldiers Cap Group. There is evidence for major thrusting of portions of Soldiers Cap Group over the Fullarton River Group, and for emplacement of a tectonic sheet of Doherty Formation over Fullarton River Group sediments (Figure 1).

REVISION OF THE SOLDIERS CAP AND MARY KATHLEEN GROUPS

The Kuridala Formation of Carter *et al.* (1961) crops out in the western and central southern parts of the Kuridala and Selwyn 1:100000 Geological Special Sheets. Donchak *et al.* (1983) and Blake *et al.* (1983) recognised no internal stratigraphy, and instead subdivided the Kuridala Formation into lithologic subunits. These authors correlated it with both the Answer Slate and the Soldiers Cap Group. Our work indicates that the Kuridala Formation is not a discrete lithostratigraphic unit, but an agglomeration of other established or newly defined units.

Most of the schists, meta-arenites, phyllites and calc-silicate rocks mapped as Kuridala Formation (Blake *et al.*, 1983) between the Gin Creek Block and the Mount Dore Fault Zone (Figure 1) are reassigned to the Staveley Formation (Mary Kathleen Group), as originally proposed by Carter *et al.* (1961)

To the east of the Mount Dore Fault Zone, the Kuridala Formation can be subdivided into four discrete lithostratigraphic units. The upper three of these are so similar lithologically to the constituent formations of the Soldiers Cap Group in the east, that we regard them as extensions of the Group. The fourth and lowermost unit is the feldspathic metasedimentary package, now termed the New Hope Arkose, which has been equated with the Glen Idol Schist, the uppermost unit in the Fullarton River Group.

A discrete Kuridala Formation now no longer exists, and we recommend the name be removed from the stratigraphic register, with suitable revision of the Mary Kathleen Group.

DEFINITION OF THE MARONAN SUPERGROUP

Proposed name: Maronan Supergroup.

Derivation of name: Maronan Station, 60 km southeast of Cloncurry. lat.21°03'49"S, long.140°55'20"E (54K VB919708).

Constituent Groups: The Maronan Supergroup consists of the Fullarton River and Soldiers Cap Groups.

Distribution: The Supergroup occupies two main belts in the far eastern part of the Mount Isa Inlier. These are the eastern Soldiers Cap belt and the western Selwyn belt, separated by the Williams Batholith and the Doherty Formation (Figure 1).

Type section: The type section for the Maronan Supergroup is a composite of sections defined for the Fullarton River Group (this report) and Soldiers Cap Group (Derrick *et al.*, 1976e).

Lithology: Mainly quartzofeldspathic migmatite, gneiss and schist, psammite, pelite, quartzite, carbonaceous shale, amphibolite and metadolerite, with minor tourmalinite and banded iron formation.

Thickness: Greater than 8800 m.

Stratigraphic Relations and Age: The base of the Maronan Supergroup is not exposed. Boundaries with other units in the Cloncurry region are tectonic, and stratigraphic relationships are unclear. Around Cloncurry township, the Soldiers Cap Group overlies the partially brecciated Doherty and Corella Formations. In the Blackrock-Maramungee area the Doherty Formation overlies the Fullarton River Group. In the west, the Soldiers Cap Group is tectonically juxtaposed against and over the Staveley Formation along the Mount Dore Fault Zone.

No absolute age has yet been determined for the Supergroup, and the only date available for metasediments in the region is the single U-Pb zircon age of 1720±7 Ma (Page, 1983) for a rhyolite lens in the Doherty Formation.

The overall character of the Maronan Supergroup, and its differences from the other established volcanosedimentary cycles in the Mount Isa Inlier suggest that it is of a different and greater age. The Leichhardt Volcanics have been dated by the U-Pb zircon method at 1875 to 1865 Ma (Page, 1978; 1983). The Maronan Supergroup is thought to be younger than this (Beardsmore *et al.*, 1988).

COMMENTS ON THE GIN CREEK BLOCK

The Gin Creek Granite and Double Crossing Metamorphics are intimately intermixed, and form a composite ellipsoidal body 150 km^2 in area, termed the Gin Creek Block. The boundary with other units is a wide zone of mylonitic strain (Switzer, 1987; Laing *et al.*, 1988; Switzer *et al.*, 1988).

The Gin Creek Granite intrudes the Double Crossing Metamorphics. In the north, it consists largely of non-foliated, locally porphyritic biotite granite, similar in character to the Mount Dore Granite to the east. Further south it is mainly strongly foliated biotite granite with abundant inclusions of Double Crossing Metamorphics. It is mapped as part of the Williams Batholith by Blake *et al.* (1983), but its regional radiometric signature is distinctly lower than typical Williams Batholith granite, and indistinguishable from the general background for the surrounding metasediments (BMR Duchess 1:250 000 Radiometric Map). This suggests it differs from typical Williams Batholith granite. Structural studies by Switzer (1987) indicate that the foliated variety was intruded syn-D_1, at least 1610 Ma ago ((Page and Bell, 1986). Dated granites elsewhere in the Williams Batholith give ages of 1510 and 1460 Ma (Richards *et al.*, 1963; Nisbet *et al.*, 1983).

The Double Crossing Metamorphics were first defined and described by Blake *et al.* (1981a,b), and consist of quartzofeldspathic schist and gneiss of upper amphibolite facies grade, with minor augen gneiss and amphibolite. Blake *et al.* (1983) interpret the unit as a package of quartzofeldspathic metasediments and felsic and mafic metavolcanics.

The higher metamorphic grade of the Double Crossing Metamorphics led Blake *et al.* (1983) to interpret the unit as correlative with, or older than the Tewinga and Malbon Groups. The interpretation we favour is that they are laterally equivalent to the lower part of the Maronan Supergroup (the Gandry Dam Gneiss), and that the foliated varieties of the Gin Creek Granite resulted from their partial melting during prograde metamorphism.

The Gin Creek Block is now interpreted as a tectonic inlier in the lower grade, much younger sequence (Switzer, 1987).

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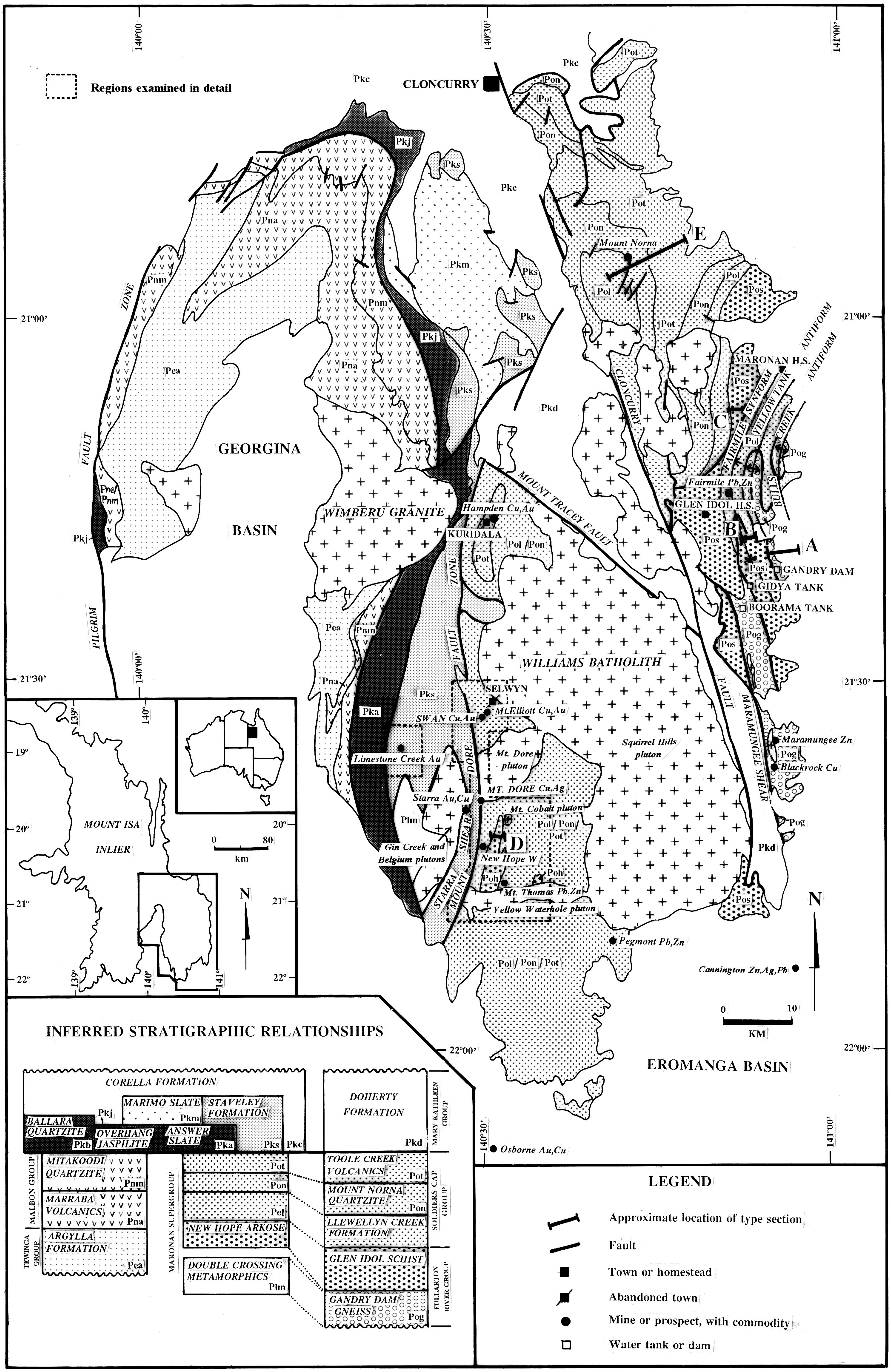
FIGURE 1 *(following page):* Summary geological map depicting the distribution of major stratigraphic units in the Cloncurry Fold Belt, including units newly defined in this paper. Approximate locations of new or other relevant type sections are indicated: **A** Gandry Dam Gneiss (Pog); **B,C** Glen Idol Schist (Pos); **D** New Hope Arkose (Poh); **E** Soldiers Cap Group (Pol, Pon, Pot; as defined by Derrick *et al.*, 1976e). All lithologies previously assigned to the Kuridala Formation (Carter *et al.*, 1961) are reassigned to the Soldiers Cap Group or New Hope Arkose.


Regions examined in detail
CLONCURRY
140°00'
140°30'
141°00'
21°00'
21°30'
22°00'
GEORGINA
BASIN
WIMBERU GRANITE
KURIDALA
WILLIAMS BATHOLITH
Squirrel Hills pluton
Mt. Dore pluton
Mt. Cobalt pluton
Gin Creek and Belgium plutons
Yellow Waterhole pluton
EROMANGA BASIN
PILGRIM FAULT ZONE
MOUNT TRACEY FAULT
CLONCURRY FAULT
MARAMUNGEE SHEAR
STARRA MOUNT DORE SHEAR
FAULT ZONE
FAIRMILE SYNFORM
YELLOW TANK ANTIFORM
BULLS CREEK ANTIFORM
MARONAN H.S.
GLEN IDOL H.S.
GANDRY DAM
GIDYA TANK
BOORAMA TANK
SELWYN
Hampden Cu,Au
SWAN Cu,Au
Mt.Elliott Cu,Au
Limestone Creek Au
Starra Au,Cu
MT. DORE Cu,Ag
New Hope W
Mt. Thomas Pb,Zn
Mount Norna
Fairmile Pb,Zn
Maramungee Zn
Blackrock Cu
Pegmont Pb,Zn
Cannington Zn,Ag,Pb
Osborne Au,Cu
A
B
C
D
E
Pkc
Pkj
Pks
Pkm
Pkd
Pka
Pna
Pnm
Pea
Plm
Pot
Pon
Pol
Pos
Pog
Poh
N
0 10 KM
MOUNT ISA INLIER
0 80 km
139°
140°
141°
19°
20°
21°
22°
INFERRED STRATIGRAPHIC RELATIONSHIPS
CORELLA FORMATION
MARIMO SLATE Pkm
STAVELEY FORMATION Pks
BALLARA QUARTZITE Pkj
OVERHANG JASPILITE Pkb
ANSWER SLATE Pka
Pkc
DOHERTY FORMATION Pkd
MARY KATHLEEN GROUP
MITAKOODI QUARTZITE Pnm
MARRABA VOLCANICS Pna
MALBON GROUP
ARGYLLA FORMATION Pea
TEWINGA GROUP
MARONAN SUPERGROUP
NEW HOPE ARKOSE
DOUBLE CROSSING METAMORPHICS Plm
TOOLE CREEK VOLCANICS Pot
MOUNT NORNA QUARTZITE Pon
LLEWELLYN CREEK FORMATION Pol
SOLDIERS CAP GROUP
GLEN IDOL SCHIST
GANDRY DAM GNEISS Pog
FULLARTON RIVER GROUP
LEGEND
Approximate location of type section
Fault
Town or homestead
Abandoned town
Mine or prospect, with commodity
Water tank or dam

APPENDIX B

ROCK SPECIMENS COLLECTED DURING THIS STUDY AND LODGED IN THE GEOLOGY DEPARTMENT JAMES COOK UNIVERSITY OF NORTH QUEENSLAND

TABLE B1 OUTCROP SPECIMENS

KEY TO ABBREVIATIONS USED IN THIS TABLE

AF	Argylla Formation
AS	Answer Slate
DCM	Double Crossing Metamorphics
GCG	Gin Creek Granite
LCF	Llewellyn Creek Formation
MCG	Mount Cobalt Granite
MDG	Mount Dore Granite
MNQ	Mount Norna Quartzite
MQ	Mitakoodi Quartzite
MUG	Mount Ulo Granite
MV	Marraba Volcanics
NHA	New Hope Arkose
SF	Staveley Formation
TCV	Toole Creek Volcanics
YWG	Yellow Waterhole Granite

P	P-section; section cut parallel to mineral elongation and orthogonal to foliation
N	N-section; section cut orthogonal to both mineral elongation and foliation.

//	parallel to
⊥	orthogonal to
X	sample/thin-section exists
-	no thin-section

SL	grid reference referring to Selwyn Special 1:100000 Geological Map Sheet 7054; part 6954

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
STAUROLITE ISOGRAD TRAVERSE (MOUNT COBALT AREA)							
29951	87048		Quartz-muscovite-biotite-chlorite schist; chlorite as pseudomorphs after syn-to post-D_3 biotite porphyroblasts.	X	2:A=P B=N	MNQ	Orientated
27481	87119A		"	X	2:A=P B=N	"	"
27482	87119B		"	X	4:AI,II=P BI,II=N	"	"
27483	87120		"	X	4:AI,II=P BI,II=N	"	"
27484	87121A		Quartz-muscovite-biotite-staurolite-garnet schist; mildly carbonaceous.	X	2:A=P B=N	"	Unorientated
27485	87121B		"	X	4:AI,II=P BI,II=N	"	"
27486	87121C		"	X	4:AI,II=P BI,II=N	"	"
27487	87121D		"	X	4:AI,II=P BI,II=N	"	"
27488	87122A		"	X	2:A=P B=N	"	Orientated
27489	87122B		"	X	-	"	"
27490	87123		"	X	6:AI,II=P BI,II=N CI,II‖S3	"	Unorientated
27491	87124A		Muscovite-quartz-biotite=staurolite±garnet schist; mildly carbonaceous; biotite porphyroblasts.	X	4:AI,II=P BI,II=N	"	"
27492	87124B		"	X	2:A=P B=N	"	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
CONTACT METAMORPHOSED ROCKS							
27493	ANDAL		Chiastolitic carbonaceous slate.	X	X	TCV	
27494	84142		Hornfelsed psammopelite; muscovite-biotite-quartz-K-feldspar-sillimanite-andalusite-cordierite gneiss.	X	X	LCF	
27495	87129A		Hornfelsed psammopelite; biotite augen with K-feldspar rims (ex-cordierite?).	X	X	"	
27496	87129B			X	X	"	
27497	87129C			X	X	"	
27498	87131A		Hornfelsed psammopelite; less weathered than 27495-27497. Cordierite-bearing (now retrogressed to biotite?).	X	X	"	
27499	87131B		Hornfelsed biotite-rich psammopelite.	X	X	"	
27500	87132A		Relatively unweathered, biotite-rich hornfelsed psammopelite.	X	X	"	
27501	87132B		Hornfelsed psammopelite.	X	X	"	
27502	87133			X	X	"	
27503	87134			X	X	"	
27504	87135		Hornfelsed psammopelite; sillimanite-cordierite-biotite, etc.	X	X	"	
27505	87136			X	X	"	
27506	87137		Hornfelsed psammopelite; chiastolitic andalusite present.	X	X	"	

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
GRANITES (DEFORMED AND UNDEFORMED)							
27507	84031A		Muscovite-tourmaline granite; extremely weathered; weakly foliated.	X	2:A,B	GCG	
27508	84036		Muscovite-tourmaline granite; less foiated.	X	X	"	
27509	84164		Muscovite-tourmaline granite.	X	X	"	
27510	84254		Strongly foliated (sheared) quartzofeldspathic rock; possibly ex-granite.	X	X	"	
27511	84280		Muscovite-tourmaline granite; weakly foliated.	X	X	"	
27512	84345		Foliated quartzofeldspathic rock; deformed muscovite-tourmaline granite?	X	X	"	
27513	84192A		Fine (<1 mm) biotite+K-feldspar+plagioclase+quartz, banded/foliated rock; sheared granite?	X	X	"	
27514	84192B		As per 27513, but coarser (2-4 mm).	X	X	"	
27515	85269		Coarse-grained (5 mm) biotite granite.	X	X	YWG	
27516	87126		Coarse grained (5 mm) biotite granite; weakly foliated.	X	2:A,B	"	
27517	84370		Slightly weathered, medium (2-3 mm) biotite granite.	X	X	MUG	
27518	84125		Fine to medioum grained (1-2 mm) biotite granite.	X	X	MCG	
27519	84140		Fine grained (<1 mm) muscovite-feldspar rock; microgranite?	X	X	MCG dyke?	
27520	84146		Brecciated and altered medium grained granite; K-feldspar+tourmaline± quartz alteration.	X	-	MDG	
27521	84149		Heavily altered, fine-medium grained (1-2 mm) granite.	X	X	"	
27522	84152		Fractured, weakly foliated and altered medium-grained granite.	X	-	"	
27523	MT. DORE GRANITE		Mildly altered, medium-grained (<5 mm) biotite granite.	X	X	"	

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
AMPHIBOLITES, META-DOLERITES AND META-BASALTS							
27524	84017		Foliated $\pm$ differentiated amphibolite; grainsize < 1.5 mm.	X	2:A=N B=P	LCF	Orientated
27525	84068		"	X	X	"	
27526	84083		"	X	X=P	"	Orientated
27527	84130		Coarse (3-5 mm), unfoliated amphibolite	X	X	"	
27528	84256		Fine (<1.5 mm), subophitic amphibolite.	X	X	"	
27529	84276		Moderately foliated amphibolite; grainsize; 1.5 mm.	X	X	"	
27530	84344		"	X	X	"	
27531	84371		Hornfelsed amphibolite; massive, highly magnetic.	X	X	"	Adjacent to MCG
27532	84552		Weathered (orotherwise altered) actinolitic amphibolite; metabasalt?	X	X	"	
27533	85019		Fine-grained, massive amphibolite.	X	X	"	
27534	85047		Fine-grained (<1.5 mm) amphibolite; meta-dolerite.	X	X	"	
27535	85054		Actinolite-epidote rock; massive, fine-grained; meta-basalt?	X	X	SF	
27536	85126		Medium-coarse (3-5 mm) amphibolite; actinolite or hornblende + plagioclase.	X	X	"	
27537	85132		Massive, medium-coarse (3-5 mm) amphibolite; meta-basalt or dolerite.	X	X	"	
27538	85222		Porphyroblastic scapolite+biotite rock; strongly foliated; metasomatised amphibolite.	X	X	MNQ	Mt. Cobalt Mine
27539	85234		Massive to weakly foliated, fine-medium (1-3 mm) actinolitic amphibolite.	X	X	SF	
27540	85266A		Fine (<1 mm), massive amphibolite.	X	X	"	
27541	85266B		Medium-coarse (1-2 mm), massive (ortho-) amphibolite.	X	X	"	

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
AMPHIBOLITES, META-DOLERITES AND META-BASALTS (cont/d)							
27542	85268		Coarse (up to 15 mm), massive euhedral actinolitic amphibolite; meta-basalt?	X	-	DCM	
27543	87050		Pyroxene-porphyritic amphibolite; hornfelsed metabasalt.	X	X	SF	
27544	87062		Strongly foliated, fine (<1 mm) amphibolite.	X	2:A=N B=P	LCF/MNQ?	
27545	87083		Pyroxene-bearing (hornfelsed) meta-basalt.	X	X	SF	
27546	GARNET BASALT		Massive, medium-grained (3-5 mm) andradite+calcite rock; metasomatised meta-basalt.	X	X	"	
27547	84545		Unmetamorphosed but weathered, ophitic diorite; pyroxene+plagioclase.	X	X		E-W dyke rock
DOUBLE CROSSING METAMORPHICS							
27552	84035A		Crenulated quartz-biotite-K-feldspar-muscovite schist; K-feldspar is porphyroblastic/porphyroclastic.	X	2:A=P B=N	DCM	Orientated
27553	84035B		Quartz-muscovite-biotite schist; refolded isoclinal fold.	X	-	"	Unorientated
27554	84343		Folded quartz-biotite-muscovite-K-feldspar schist; 2 parts.	X	-	"	"
27555	85155		Quartz-biotite-K-feldspar±sillimanite schist; quartzofeldspathic segregations.	X	-	"	"
MESOZOIC SEDIMENTS							
27556	84408		Well-cemented, moderately sorted, moderately-poorly rounded, coarse quartz sandstone; grain-supported.	X	X		Unorientated
27557	85303		Interbedded coarse sandstone and fine sandstone-siltstone; sandstone is very poorly sorted and rounded.	X	-		"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
GIN CREEK GRANITE AND HORNFELSED DOUBLE CROSSING METAMORPHICS							
27558	87171A		Hornfelsed DCM biotite schist; cordierite-sillimanite bearing.	X	X	DCM	Unorientated
27559	87171B		"	X	X	"	"
27560	87172A		Muscovite-tourmaline granite; fine-grained (<1.5 mm); close to margin of pluton.	X	X	GCG	"
27561	87172B		Muscovite-tourmaline granite; medium-grained (2-3 mm).	X	X	"	"
27562	87172C		Muscovite-tourmaline granite; medium-coarse grained (<5 mm).	X	X	"	"
27563	87173		Weakly hornfelsed DCM biotite-feldspar-quartz-muscovite schist; andalusite porphyroblasts.	X	-	DCM	"
NEW HOPE ARKOSE							
29781	84124		Contact metamorphsed meta-arkose; irregular, ellipsoidal porphyroblasts of (ex-?) andalusite (now muscovite).	X	X	NHA	Unorientated
29782	84139		Strongly foliated, weathered meta-arkose; medium-coarse grained (1-2mm); moderately-poorly sorted; silicified.	X	X	"	Orientated
29783	84143		As per 29782; less silicified.	X	X	"	Unorientated
29784	84145		As per 29782.	X	2:A=40oN B=P	"	"
29785	84553		Moderately foliated meta-arkose; medium-grained (<1 mm); poorly sorted.	X	X	"	"
29786	85274	SL 536920	Medium-grained meta-arkose; poorly sorted; some muscovite.	X	X	"	"
29787	87107A		Moderately foliated, medium-grained (<0.6 mm), moderately sorted meta-arkose.	X	X	"	"
29788	87107B		"	X	X	"	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
PSAMMITES - LLEWELLYN CREEK FORMATION							
29789	84015		Coarse (<2mm), poorly sorted and rounded, siliciclastic (psammitic) sandstone; no foliation evident.	X	X	LCF	Unorientated
29790	84109		Coarse (<2 mm) quartz (± feldspar) psammite; weak to moderate foliation. Poorly sorted and rounded; quartz veins sub-parallel to foliation.	X	-	"	"
29791	85315		Very coarse sandstone to granulestone; very poorly sorted and rounded; moderate foliation.	X	X	"	"
PSAMMITES - MOUNT NORNA QUARTZITE							
29792	85204	SL 473960	Quartz-plagioclase psammite; medium-grained; poorly sorted and rounded.	X	X	MNQ	"
29793	85276		Feldspathic? qartz sandstone; moderately-strongly foliated; medium- to coarse-grained; poorly sorted and rounded.	X	X	"	"
PSAMMOPELITES - LLEWELLYN CREEK FORMATION							
29794	84001		Strongly foliated quartz-muscovite schist.	X	X	LCF	Orientated
29795	84013		Strongly foliated quartz-muscovite schist; more micaceous; weak crenulation/kinking at high angle to main foliation.	X	2:A=P B=P	"	"
29796	84071		Strongly foliated quartz-muscovite schist; bedding, and bedding-fissility apparent; fine-grained.	X	X=N	"	"
29797	84073		Quartz-muscovite-biotite schist; well-developed mineral (biotite) lineation.	X	X=P	"	"
29798	84079		Very large sample; well-bedded psammopelite; bedding 5-8 cm; graded coarse to fine; fine part is micaceous and strongly foliated; 2 foliations - one slaty, close to parallel with bedding; one crenulation.	X	-	"	"
29799	84081		Quartz-muscovite-biotite schist; bedding at high angle to strong (S_2?) foliation; very fine overprinting crenulation.	X	2:A=P B=N	"	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
PSAMMOPELITES - LLEWELLYN CREEK FORMATION (cont/d)							
29800	84082		Quartz-muscovite-biotite-garnet-andalusite schist; strongly foliated; garnet porphyroblasts to 1 mm.	X	X=P	LCF	Unorientated
29801	84084		Quartz-muscovite-biotite-garnet-andalusite schist; andalusite less common; weak crenulation overprinting at high angle.	X	X=P	"	Orientated
29802	84085		Quartz-muscovite-biotite schist; small garnet (<0.5 mm).	X	X=P	"	"
29803	84086		Quartz-muscovite-biotite phyllite/schist; fine-grained; compositional banding (biotite- versus quartz-rich; bedding); slaty foliation parallel to S_0; overprinting cleavage (S_2?).	X	-	"	"
29804	84100		Quartz-muscovite-biotite schist; large andalusite porphyroblasts; foliation anastomoses around porphyroblasts.	X	X	"	Unorientated
29805	84103		Quartz-muscovite-biotite schist; very large andalusite porphyroblasts; compositional banding (S_0) sub-parallel with foliation.	X	2:A=P B=N	"	Orientated
29806	84112		Bedded quartz-muscovite schist; part coarse-grained (psammitic); part phyllitic (pelitic); pelitic part strongly foliated and crenulated.	X	X=P?	"	"
29807	84129		As per 29807; large (2mm) biotite porphyroblasts in more pelitic part.	X	-	"	Unorientated
29808	85005A		Quartz-muscovite$\pm$biotite schist; "knotted" due to very large andalusite porphyroblasts (<3 cm).	X	-	"	"
29809	85010		Largely quartzose; shows part of a Bouma sequence, so turbiditic; more pelitic parts better foliated.	X	-	"	Orientated
29810	85044		Quartz-muscovite-biotite schist; flattened "porphyroblasts" (of andalusite?) at a low angle to the main foliation.	X	X=N	"	"
29811	85206		Quartz-muscovite-biotite schist; strongly foliated; strong mineral elongation.	X	2:A=P B=N	"	"
29812	85310		Quartz-muscovite-biotite schist/phyllite; compositional layering (S_0) at high angle to main foliation (S_2?).	X	-	"	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
PSAMMOPELITES - LLEWELLYN CREEK FORMATION (cont/d)							
29813	85312		Biotite-quartz-muscovite±andalusite schist; strongly foliated and lineated.	X	-	LCF	Unorientated
29814	85314		Quartz-muscovite-biotite-garnet schist; weak compositional banding (S_0) at high angle to foliation; weak crenulation at high angle to both.	X	2:A=P B=N	"	"
29815	87104		Quartz-muscovite-biotite-garnet phyllite/schist; strongly foliated; S_0 parallel to slaty foliation (S_1?); S_2 as fine crenulation/differentiation at low angle; garnet (<0.5 mm); decrenulation possibly occurring.	X	X	"	"
QUARTZ-MUSCOVITE SCHISTS (LLEWELLYN CREEK FORMATION OR MOUNT NORNA QUARTZITE)							
29816	84040		Quartz-muscovite-biotite schist; heavily weathered; several foliations - 1 slaty; at least 2 crenulations.	X	2:A B	LCF/MNQ	Orientated
29817	84062		Quartz-mica phyllite; strong mineral streaking in foliation.	X	X=P	"	Unorientated
29818	84078		Pale grey-green micaceous phyllitic/schistose psammopelite; compositional banding (S_0) apparent.	X	X	"	Orientated
29819	84195		Strongly foliated quartz-muscovite-biotite schist; some compositional banding evident; 2 foliations - one sub-parallel to banding; one at low angle.	X	2:A=P B=N	"	"
29820	84229		Quartz-muscovite schist; strongly foliated, and crenulated/kinked at high angle.	X	2:A=P B=N	"	"
29821	84385		Quartz-muscovite phyllite; strongly foliated, with overprinting crenulation; 2 crenulations - one strikes N-S, one NNW.	X	2:A=P* B=N	"	"
29822	84453		Foliated and crenulated, weathered quartz-mica phyllite.	X	X=P*	"	Unorientated
29823	84547		Foliated quartz-muscovite-biotite phyllite; compositional banding (S_0) is graded, indicating younging west; class 1-2; antiform E?	X	2:A=P B=N	"	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	SAMPLE TYPE TS	LITHO UNIT	COMMENTS
QUARTZ-MUSCOVITE SCHISTS (LLEWELLYN CREEK FORMATION OR MOUNT NORNA QUARTZITE)(cont/d)							
29824	85024		Fine-grained quartz-muscovite-biotite schist; compositional banding (S_0); antiform E (foliation at measurable angle to S_0).	X	-	LCF/MNQ	Orientated
29825	85156		Quartz-muscovite phyllite/schist; compositional layering (S_0); slaty foliation sub-parallel to S_0; bands of crenulations overprint.	X	X=P	"	"
29826	85213		Strongly foliated and crenulated quartz-muscovite-biotite schist; fine crenulation (<1 mm). L_{cren} // L_m. (* sections cut relative to the crenulation)	X	X=N	"	"
QUARTZ-MICA SCHISTS & PHYLLITES - MISCELLANEOUS UPPER MARONAN SUPERGROUP							
29827	84025		Fine, grey-green quartz-mica phyllite; very fine crenulation overprinting slaty foliation.	X	2:A=P B=N	?	Orientated
29828	84070		Quartz-muscovite schist; strong, anastomosing foliation; compare with 29840.	X	X	?	Unorientated
29829	84121		Quartz-muscovite schist/phyllite; kinking/crenulation overprints slaty foliation.	X	X=P	?	"
29830	84178		Quartz-muscovite$\pm$garnet schist; at least one crenulation overprinting fine slaty foliation.	X	2:A=P B=N	?	"
29831	84186		Quartz-muscovite schist/phyllite; strong slaty foliation with fine, overprinting crenulation (S_2?); biotite porphyroblasts scattered throughout, at 30^o to fine muscovite lineation.	X	2:A=P B=N	?	Orientated
29832	84199		Quartz-muscovite schist/phyllite; fine slaty foliation overprinted by at least 2 crenulations (one may be S_2).	X	-	?	"
29833	84200		Fine quartz-muscovite schist/phyllite; fine crenulation overprints slaty foliation.	X	2:A=P B=N	?	Unorientated
29834	84214		Quartz-muscovite$\pm$biotite schist; coarse crenulation overprints strong slaty foliation.	X	X=P	?	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
QUARTZ-MICA SCHISTS & PHYLLITES - MISCELLANEOUS UPPER MARONAN SUPERGROUP (cont/d)							
29835	84357		Quartz-muscovite phyllite; siliceous (silicified?); one slaty foliation; one possibly overprinting.	X	2:A=P B=N	?	Orientated
29836	84381		Weathered (red-brown) quartz-muscovite schist/phyllite; one slaty to differentiated foliation overorinted by a kinking/crenulation.	X	2:A=P B=N	?	"
QUARTZ-MICA SCHISTS & PHYLLITES - SHEARED & ALTERED TOOLE CREEK VOLCANICS OR STAVELY FORMATION							
29837	84009		Pale grey-green quartz-muscovite phyllite; strongly foliated, with microfolds and later crenulations.	X	X	TCV	"
29838	84018		Strongly foliated, pale green-grey quartz-muscovite phyllite/schist; early foliation is differentiated; later crenulation.	X	X=P	"	"
29839	84223		Quartz-muscovite schist; strongly folited; foliationoverprinted by coarse (<5 mm) angular crenulation/kinking.	X	X=P	"	"
29840	84445		Strongly foliated quartz-mica phyllite; anomalous foliation; quartzose phacoids; sheared siltstone?	X	X=P	SF?	"
29841	87009		Fine quartz-muscovite schist; 2 slaty foliations evident (S_1 and S_2?).	X	2:A=N B=P	TCV	"
29842	87072		Quartz-muscovite schist; main foliation is a differentiated to crenulation cleavage; marked symmetry.	X	X	"	"
GARNET-STAUROLITE SCHISTS - MOUNT NORNA QUARTZITE							
29843	85208A		Strongly foliated quartz-muscovite-biotite-garnet-staurolite schist/phyllite; carbonaceous.	X	2:A=N B=P	MNQ	"
29844	85208B		"	X	2:A=P B=N	"	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
GARNET-STAUROLITE SCHISTS - MOUNT NORNA QUARTZITE (cont/d)							
29845	85210A		Strongly foliated quartz-muscovite-biotite-garnet-staurolite schist/phyllite; carbonaceous; at least 2 folitions evident.	X	-	MNQ	Orientated
VARIABLY SILICIFIED CARBONACEOUS SLATES AND QUARTZ MYLONITES - TOOLE CREEK VOLCANICS							
29846	84020		Strongly foliated carbonaceous slate; folds evident; axial plane foliation is spaced; folded a slaty cleavage, or very fissile bedding.	X	-	TCV	"
29847	84027		Strongly foliated (slaty) carbonaceous slate; bedding-cleavage intersection evident.	X	X=P	"	"
29848	84051		Folded carbonaceous slate; 2 crenulations overprint "bedding"; coarser one is axial planar to fold (S_3).	X	-	"	"
29849	84183		Foliated and crenulated carbonaceous slate/phyllite; 2 crenulations overprint main slaty foliation at high angle.	X	2:A=P(S3) B=N(S3)	"	"
29850	84215C		Folded/crenulated carbonaceous slate; slaty cleavage is folded.	X	2:A=P(S3) B=N(S3)	"	"
29851	84336		Folded carbonaceous slate; axial planar cleavage is slaty to spaced; bedding well-defined.	X	X	"	"
29852	84360		Folded carbonaceous slate; cleavage is spaced, and doesn't seem to be axial planar; thus, later?	X	X=P to S	"	"
29853	84550		Glomeroporphyritic carbonaceous slate; "porphs" < 1 mm; contain K-feldspar, quartz and tourmaline. Foliation less well defined, but still present.	X	X	"	"
29854	85075		Strongly foliated carbonaceous slate; bedding well-defined; spaced to slaty foliation at high angle.	X	X=N to S	"	"
29855	85290		Strongly foliated carbonaceous slate; compositional banding (S_0) well-developed; slaty foliation at 40^{o} to bedding.	X	X=N to S	"	Unorientated

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
SILICIFIED CARBONACEOUS SLATE BRECCIAS - TOOLE CREEK VOLCANICS							
29856	84019		Strongly sheared carbonaceous slate; transposed folds evident (F_1?).	X	-	TCV	Orientated
29857	84234		Strongly silicified and otherwise altered carbonaceous slate; well banded (= black and silicified) and quartz-muscovite (pale) layers; folded (F_3?).	X	-	"	"
29858	84316		Banded, silicified carbonaceous slate; black and white layers.	X	-	"	"
29859	85265		Strongly foliated, lineated and boudinaged, silicified carbonaceous slate; some rodding evident.	X	X=N	"	Unorientated
29860	84023		Foliated black "quartzite"; possibly quartz mylonite (= silicified carbonaceous slate?).	X	-	"	Orientated
29861	84039A		Foliated siliceous carbonaceous slate breccia; angular "jigsaw" fragments; quartz infill and replacement.	X	-	"	"
29862	83039B		As above, but more strongly foliated, indicating brecciation was pre- or syn-mylonitisation.	X	-	"	Unorientated
29863	84295		Silicified carbonaceous slate breccia; fragments are pale; matrix black and foliated.	X	-	"	Orientated
QUARTZ MYLONITES							
29864	84024		Strongly foliated, banded quartzite; banding parallel to foliation (quartz mylonite; <u>not</u> sedimentary).	X	2:A=P B=N	TCV/SF	Unorientated
29865	84038A		Strongly foliated siliceous rock ("quartzite"); quartz mylonite.	X	2:A=P B=N	"	Orientated
29866	83038B		Foliated quartzite; possible S-C planes evident.	X	-	"	"
29867	84170A		Strongly foliated, banded "quartzite" (quartz mylonite).	X	2:A=P B=N	"	"

JCUNQ NUMBER	TJB NUMBER	LOCATION	DESCRIPTION	SAMPLE TYPE HS	TS	LITHO UNIT	COMMENTS
QUARTZ MYLONITES							
29868	84289		Strongly foliated, banded quartzite; quartz mylonite.	X	2:A=P B 40^o N	TCV/SF	Orientated
29869	84440		Strongly foliated, fine quartzite; quartz mylonite.	X	X	"	"
29870	85298		"	X	X 40^o P	"	"
MOUNT DORE BRECCIAS							
29871	87094A		Angular, poorly sorted breccia; extremely altered (K-feldspar, quartz, tourmaline); ex-carbonaceous slate or quartz-muscovite phyllite.	X	-	TCV?	Unorientated
29872	87094B		As above; smaller sample.	X	X	"	"
29873	84551		Feldspathic, angular breccia; pale material is apatite $\pm$ carbonate.	X	X	"	"

TABLE B2 DRILLCORE SPECIMENS

KEY TO ABBREVIATIONS USED IN THIS TABLE

Drillhole number is of the form "**PROJECT PREFIX** (SMD or SHQ) - **YEAR** (1976 to 1979) - **HOLE NUMBER**".

OTS: Ordinary thin-section, used for standard petrographic analysis.

PTS: Polished thin-section, used for electron microprobe analysis of minerals.

DPB: Doubly polished block, used for fluid inclusion studies.

ISO: Sample used for isotopic studies; one or more minerals separated for analysis ($\delta^{18}O$ - B,C,D,K,Q; $\delta^{13}C$ - C,D; δD - B).

The minerals analysed using electron microprobe and isotopes are listed in the respective columns (PTS and ISO). Abbreviations are as follows:

A	amphibole	G	garnet
Ap	apatite	K	K-feldspar
B	biotite	M	muscovite
C	calcite	Q	quartz
Ch	chlorite	T	tourmaline
D	dolomite	U	sample prepared but unused
E	epidote		

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27063	01-01	SMD-76-01	44.60-44.72	Brecciated and altered quartz-muscovite schist	X		X	
27064	01-02	"	54.19-54.31	Brecciated and altered quartz-muscovite schist	X	KMT		
27065	01-03	"	62.60-62.68	Altered quartz-muscovite schist	X			
27066	01-04	"	65.62-65.69	Brecciated and altered quartz-muscovite schist				
27067	01-05	"	72.10-72.16	Silicified quartz-muscovite schist				
27068	01-06	"	78.85-78.94	Brecciated (milled) and altered quartz-muscovite schist	X		X	
27069	01-07	"	100.90-100.94	Quartz-muscovite schist/phyllite				
27070	01-08	"	144.22-144.25	Mn-oxide(?) vein in weathered phyllite				
27071	01-09	"	148.00-148.10	Carbonaceous slate with quartz veins				
27072	01-10	"	162.51-162.55	Ferruginous fault breccia (cataclasite)	X			
27073	07-01	SHQ-76-07	42.00-42.10	Contact between altered Mount Dore Granite and phyllite	X			
27074	07-02	"	49.78-49.85	Brecciated and altered quartz-muscovite schist	X		X	
27075	07-03	"	57.18-57.35	Altered quartz-muscovite schist/phyllite	X			
27076	07-04	"	69.05-69.11	Brecciated, altered and mineralized quartz-muscovite schist				
27077	07-05	"	72.75-72.90	Altered and mineralized milled breccia	X	KMT		
27078	07-06	"	76.40-76.49	Altered and mineralized milled breccia		Un		
27079	07-07	"	166.0	Ferruginous fault breccia (cataclasite)	X			
27080	08-01	SHQ-76-08	90.85-91.00	Brecciated and altered quartz-muscovite schist	X		X	
27081	08-02	"	91.40-91.55	Brecciated (milled), altered and mineralized schist	X			
27082	08-03	"	93.30-93.60	Brecciated and altered quartz-muscovite schist				
27083	13-01	SHQ-76-13	38.15-38.25	Brecciated and altered quartz-muscovite schist				
27084	13-02	"	52.30-52.50	Altered and mineralized milled breccia				
27085	13-03	"	52.80-52.96	Altered and mineralized milled breccia	X		X	
27086	13-04	"	53.90-54.00	Altered and mineralized milled breccia	X		X	
27087	13-05	"	55.43-55.50	Brecciated (milled), altered and mineralized schist	X			
27088	13-06	"	56.20-56.23	Quartz-muscovite schist/phyllite	X		X	
27089	13-07	"	63.05-63.14	Silicified carbonaceous slate				
27090	13-08	"	154.41-154.44	Ferruginous fault breccia (cataclasite)				

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27091	16-01	SHQ-77-16	43.33-43.44	Altered(?), deformed Mount Dore Granite	X			
27092	16-02	"	96.02-96.34	Brecciated and altered quartz-muscovite phyllite	X			
27093	16-03	"	108.00-108.07	Brecciated, altered and mineralized schist	X		X	
27094	16-04	"	134.11-134.19	Brecciated, altered and mineralized carbonaceous slate	X		X	
27095	16-05	"	181.15-181.20	Quartz-muscovite phyllite	X			
27096	19-01	SHQ-77-19	158.88-159.07	Brecciated and altered (?)siltstone			X	
27097	19-02	"	157.97-158.20	Brecciated and altered (?)siltstone		BDM		
27098	19-03	"	162.45-162.62	Brecciated and altered (?)siltstone	X		X	
27099	19-04	"	164.42-164.51	Brecciated and altered (?)siltstone	X	AB		
27100	19-05	"	166.20-166.28	Brecciated and altered (?)siltstone				
27101	19-06	"	166.00-166.15	Brecciated and altered (?)siltstone	X			
27102	19-07	"	169.30-169.39	Massive carbonate replacement of (?)siltstone breccia	X	ChDKT		
27103	19-08	"	171.90-172.03	Brecciated and altered (?)siltstone				
27104	19-09	"	187.13-187.23	Silicified breccia				
27105	19-10	"	196.95-197.00	Highly altered breccia	X			
27106	19-11	"	216.70-216.90	Altered and mineralized breccia	X			
27107	19-12	"	222.65-222.80	Altered and mineralized breccia	X			
27108	19-13	"	178.8	Silicified and carbonate-veined breccia	X			C
27109	19-14	"	231.0	Altered and mineralized milled breccia				
27110	19-15	"	283.70-283.80	Altered and mineralized milled breccia	X		X	
27111	19-16	"	284.28-284.40	Altered and mineralized milled breccia				KC
27112	19-17	"	284.54-284.68	Altered and mineralized milled breccia				
27113	19-18	"	282.18-282.34	Altered milled breccia	X			
27114	19-19	"	305.20-305.42	Altered milled phyllite breccia				
27115	19-20	"	307.45-307.63	Altered tabular breccia				
27116	19-21	"	315.71-315.90	Altered tabular breccia			X	
27117	19-22	"	316.00-316.22	Altered breccia	X		X	Q
27118	19-23	"	327.89-328.15	Altered breccia				Q
27119	19-24	"	335.90-336.08	Altered and mineralized quartz-muscovite phyllite				
27120	19-25	"	336.43-336.61	Variably silicified quartz-muscovite phyllite				
27121	19-26	"	390.30-390.45	Altered milled breccia	X	ApT		

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27122	23-01	SHQ-78-23	52.32-52.46	Banded calc-cilicate	X			
27123	23-02	"	52.72-52.82	Banded calc-cilicate	X			
27124	23-03	"	57.70-57.80	Altered calc-silicate	X	CChKT		
27125	23-04	"	59.81-59.95	Brecciated, altered and mineralized (?)meta-siltstone				
27126	23-05	"	60.42-60.51	Fractured and altered meta-siltstone				
27127	23-06	"	67.00-67.18	Brecciated (milled) and altered meta-siltstone				
27128	23-07	"	69.75-69.80	Brecciated (milled) and altered meta-siltstone	X			
27129	23-08	"	69.90-70.04	Calcite veining in altered meta-siltstone	X			
27130	23-09	"	70.27-70.43	Calcite veining in altered meta-siltstone	X	CChMT		
27131	23-10	"	71.53-71.68	Altered meta-siltstone	X		X	CQ
27132	23-11	"	71.98-72.15	Altered meta-siltstone	X		X	
27133	23-12	"	72.72-72.85	Altered meta-siltstone		CEGKT		
27134	23-13	"	76.72-76.87	Veined and altered meta-siltstone	XX		XX	
27135	23-14	"	79.22-79.44	Veined and altered meta-siltstone	X			
27136	23-15	"	59.12-59.25	Brecciated (milled) and altered meta-siltstone				
27137	23-16	"	84.88-85.00	Brecciated (milled) and altered meta-siltstone				
27138	23-17	"	85.86-85.01	Brecciated and altered meta-siltstone				
27139	23-18	"	78.13-78.19	Quartz-biotite phyllite	X			
27140	23-19	"	114.58-114.70	Biotite-carbonate-amphibole-quartz rock (altered breccia?)	X	BCCh		BC
27141	23-20	"	117.40-117.48	Biotite-carbonate-amphibole-quartz rock (altered breccia?)	X	BT		
27142	23-21	"	133.77-133.94	Biotite-carbonate-amphibole-quartz rock (altered breccia?)				BC
27143	23-22	"	140.27-140.45	Biotite-carbonate-quartz rock (altered breccia?)	X			B
27144	23-23	"	150.63-150.75	Brecciated and altered quartz-biotite phyllite	X			
27145	23-24	"	151.00-151.14	Brecciated and altered quartz-biotite phyllite		AApBT		B
27146	23-25	"	159.22-159.43	Altered quartz-biotite phyllite	X	ChDKMT		
27147	23-26	"	163.28-163.45	Altered quartz-biotite phyllite	X		X	Q
27148	23-27	"	171.49-171.65	Altered quartz-biotite phyllite				
27149	23-28	"	174.10-174.12	Graphically intergrown quartz and microcline (granite?)	X			
27150	23-29	"	174.80-174.86	Brecciated (milled) and altered meta-siltstone				
27151	23-30	"	179.35-179.47	Brecciated, altered and mineralized quartz-mica phyllite				
27152	23-31	"	180.45-180.50	Highly altered milled breccia (uncertain protolith)	X			

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27153	23-32	SHQ-78-23	183.35-183.50	Altered, veined quartz-muscovite phyllite	X			C
27154	23-33	"	184.29-184.35	Mineralized quartz vein in altered phyllite				
27155	23-34	"	186.50-186.64	Brecciated (milled) and altered phyllite				
27156	23-35	"	196.00-196.14	Brecciated (milled) and altered phyllite		M		
27157	23-36	"	200.13-200.23	Carbonate-veined, siliceous meta-siltstone				
27158	23-37	"	210.86-210.96	Altered scapolitic meta-siltstone		ChDKM		
27159	23-38	"	212.30-212.42	Brecciated and altered, banded meta-siltstone				
27160	23-39	"	209.51-209.68	Altered metasiltstone	X	BT		
27161	23-40	"	240.38-240.55	Mineralized carbonate veins in altered metasiltstone				
27162	23-41	"	207.0	Quartz-tourmaline-carbonate rock (altered breccia?)	X	T		
27163	23-42	"	286.22-286.34	Quartz-microcline-carbonate vein			X	KQ
27164	23-43	"	289.53-289.60	Brecciated and altered meta-siltstone	X			
27165	23-44	"	295.40-295.63	Brecciated and altered meta-siltstone				
27166	23-45	"	300.20-300.74	Brecciated (milled), altered and mineralized (?)meta-siltstone				C
27167	23-46	"	301.90-302.03	Quartz-muscovite phyllite(?)	X			
27168	23-47	"	307.88-308.00	Altered quartz-muscovite phyllite	X			
27169	23-48	"	315.73-315.95	Brecciated and altered (?)chloritic phyllite				
27170	23-49	"	322.15-322.33	Veined quartz-biotite phyllite	XX			
27171	23-50	"	339.85-340.05	Brecciated and altered quartz-biotite phyllite				
27172	25-01	SHQ-78-25	31.30-31.45	Brecciated quartz-muscovite schist				
27173	25-02	"	45.47-45.65	Brecciated and altered quartz-muscovite schist	X		X	
27174	25-03	"	48.40-48.45	Altered milled breccia (uncertain protolith)				
27175	25-04	"	53.80-53.90	Brecciated and altered quartz-muscovite schist	XX	KMT		
27176	25-05	"	53.40-53.43	Crenulated quartz-muscovite phyllite				
27177	25-06	"	97.08-97.13	Brecciated and altered quartz-muscovite schist				
27178	25-07	"	108.55-108.66	Brecciated (milled) and altered quartz-muscovite schist	X			
27179	25-08	"	124.38-108.66	Altered carbonaceous slate				
27180	25-09	"	264.51-264.58	Quartzite (mylonitized silicified rock)	X			

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27181	27-01	SHQ-78-27	177.50-177.65	Brecciated and altered Mount Dore Granite	X	ChKMT		
27182	27-02	"	181.16-181.30	Brecciated and altered Mount Dore Granite				
27183	27-03	"	186.06-186.18	Altered and mineralized breccia (uncertain protolith)				
27184	27-04	"	186.50-186.73	Brecciated and altered (?)meta-siltstone				
27185	27-05	"	187.07-187.25	Brecciated (milled) and altered meta-siltstone				
27186	27-06	"	187.42-187.50	Brecciated and altered meta-siltstone				
27187	27-07	"	188.27-188.50	Brecciated and altered meta-siltstone	X			
27188	27-08	"	188.80-188.92	Brecciated, altered and mineralized meta-siltstone				
27189	27-09	"	189.09-189.25	Brecciated and altered meta-siltstone				C
27190	27-10	"	189.96-190.11	Brecciated and altered meta-siltstone				
27191	27-11	"	190.29-190.45	Brecciated and altered meta-siltstone				C
27192	27-12	"	191.29-191.50	Brecciated, altered and mineralized meta-siltstone				
27193	27-13	"	198.0	Sheared chlorite-(?)graphite rock		Un		
27194	27-14	"	193.5	Sheared chlorite-(?)graphite rock				
27195	27-15	"	221.80-221.86	Quartz vein in quartz-mica phyllite			X	Q
27196	27-16	"	215.20-215.32	Quartz-muscovite schist/phyllite	X			
27197	27-17	"	240.40-240.48	Silicified laminated carbonaceous slate	X			
27198	27-18	"	258.00-258.02	Rootless isoclinal fold in carbonaceous slate	X			
27199	27-19	"	266.65-266.80	Fractured and altered carbonaceous slate	X		X	
27200	27-20	"	271.36-271.50	Brecciated, altered and mineralized carbonaceous slate				
27201	27-21	"	275.05-275.15	Brecciated, altered and mineralized carbonaceous slate	X			Q
27202	27-22	"	279.43-279.55	Brecciated, altered and mineralized carbonaceous slate		ApBCh		
27203	27-23	"	288.55-288.65	Fractured, silicified and mineralized carbonaceous slate				
27204	27-24	"	308.77-309.00	Fractures and mineralized carbonaceous slate				
27205	27-25	"	321.90-322.07	Brecciated, altered and mineralized carbonaceous slate				
27206	27-26	"	337.70-337.80	Brecciated (milled) and altered carbonaceous slate				
27207	27-27	"	339.02-339.10	Chlorite-altered rock (unknown protolith)				
27208	27-28	"	350.00-350.10	Brecciated and altered carbonaceous slate				
27209	27-29	"	348.0	Brecciated and altered carbonaceous slate			X	Q

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27210	35-01	SHQ-78-35	267.20-267.36	Brecciated and altered Mount Dore Granite				
27211	35-02	"	267.80-268.00	Brecciated (milled) and altered Mount Dore Granite	X	DKT		
27212	35-03	"	304.25-304.34	Brecciated, altered and mineralized quartz-muscovite phyllite				
27213	35-04	"	304.89-305.00	Brecciated, altered and mineralized quartz-muscovite phyllite	X		X	
27214	35-05	"	313.23-313.36	Altered and mineralized quartz-muscovite phyllite	X		X	
27215	35-06	"	319.60-319.76	Brecciated and altered quartz-muscovite phyllite or slate	X		X	
27216	35-07	"	321.20-321.27	Altered and mineralized quartz-muscovite phyllite or slate	X		X	
27217	35-08	"	327.10-327.28	Altered and mineralized milled, carbonate-clast breccia	X			
27218	35-09	"	329.52-329.69	Altered and mineralized breccia (slate protolith?)	X		X	KQ
27219	35-10	"	362.87-362.97	Fractured, altered and mineralized carbonaceous slate	X			
27220	35-11	"	374.74-374.82	Altered breccia (carbonaceous slate protolith?)	X	DT		
27221	35-12	"	404.90-405.00	Fractured, altered and mineralized carbonaceous slate				
27222	35-13	"	406.97-407.07	Fractured, altered and mineralized carbonaceous slate				
27223	35-14	"	420.00-420.16	Fractured, altered and mineralized carbonaceous slate			X	
27224	35-15	"	420.26-420.35	Fractured, altered and mineralized carbonaceous slate	XX			
27225	38-01	SHQ-78-38	238.71-239.06	Deformed and altered Mount Dore Granite	XXX			
27226	38-02	"	239.06-239.15	Deformed and altered Mount Dore Granite	X			
27227	38-03	"	239.47-239.81	Deformed and altered Mount Dore Granite	XX	BChM	X	
27228	38-04	"	240.48-240.80	Deformed Mount Dore Granite	XX			
27229	38-05	"	240.80-240.94	Deformed Mount Dore Granite	XX			
27230	38-06	"	241.10-241.35	Deformed and slightly altered Mount Dore Granite	XX			
27231	38-07	"	241.84-242.11	Deformed Mount Dore Granite	XX	BChK		
27232	38-08	"	260.44-260.62	Deformed and altered Mount Dore Granite	X	T		
27233	38-09	"	261.82-262.10	Aplite	X			
27234	38-10	"	262.72-262.97	Contact between aplite and main Mount Dore Granite	X			
27235	38-11	"	268.60-268.68	Deformed and altered Mount Dore Granite	X	M		KQ
27236	38-12	"	271.40-271.59	Brecciated and altered Mount Dore Granite	XX			
27237	38-13	"	283.38-283.47	Haematite-pyrite vein in altered Mount Dore Granite	XX			
27238	38-14	"	294.36-294.60	Veined and otherwise altered Mount Dore Granite	X	ApCChMT		CKQ
27239	38-15	"	305.68-305.83	Brecciated and altered Mount Dore Granite				

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27240	38-16	SHQ-78-38	422.65-422.76	Milled and altered Mount Dore Granite breccia				
27241	38-17	"	423.44-423.76	Milled and altered Mount Dore Granite breccia				
27242	38-18	"	425.00-425.23	Milled and altered Mount Dore Granite breccia	XX	DKT		
27243	40-01	SHQ-79-40	127.00-127.10	Brecciated, altered and mineralized carbonaceous slate	X	ChKT		
27244	40-02	"	137.05-137.16	Brecciated, altered and mineralized carbonaceous slate				
27245	40-03	"	138.26-138.40	Brecciated and altered carbonaceous slate				
27246	40-04	"	139.07-139.25	Brecciated (milled), altered and mineralized carbonaceous slate				
27247	40-05	"	141.15-141.25	Brecciated (milled) and altered carbonaceous slate				
27248	40-06	"	141.30-141.44	Ferruginous brecciated (milled), altered and mineralized carbonaceous slate				
27249	40-07	"	163.80-163.87	Brecciated massive pyrite with interstitial chlorite			X	
27250	40-08	"	169.70-169.77	Crenulated quartz-muscovite schist	X			
27251	40-09	"	175.80-175.84	Fractured and altered quartz-muscovite schist			X	
27252	40-10	"	177.50-177.65	Altered quartz-muscovite phyllite				
27253	40-11	"	180.39-180.54	Brecciated, altered and mineralized quartz-muscovite phyllite				
27254	40-12	"	188.55-188.75	Brecciated and silicified phyllite/slate				
27255	40-13	"	201.85-201.96	Altered quartz-muscovite phyllite	X			
27256	40-14	"	224.96-225.22	Altered rock (phyllite protolith?)	X			
27257	40-15	"	242.79-242.91	Altered carbonaceous slate				
27258	40-16	"	246.32-246.57	Fractured and mineralized carbonaceous slate	XXX			
27259	40-17	"	253.50-253.73	Veined and altered carbonaceous slate			XXX	K
27260	40-18	"	255.74-255.87	Veined and altered, mineralized carbonaceous slate				
27261	40-19	"	257.60-257.82	Brecciated, altered and mineralized carbonaceous slate				
27262	40-20	"	263.6	Brecciated and altered carbonaceous slate				
27263	40-21	"	270.35-270.50	Veined and mineralized carbonaceous slate			X	
27264	40-22	"	271.60-271.80	Brecciated (milled), altered and mineralized carbonaceous slate	XX		X	
27265	40-23	"	277.08-277.30	Brecciated and altered carbonaceous slate	XXX			C
27266	40-24	"	278.00-278.17	Altered milled breccia (uncertain protolith)	X			
27267	40-25	"	279.07-279.22	Altered and mineralized, milled breccia (uncertain protolith)				
27268	40-26	"	279.30-279.49	Brecciated (milled), altered and mineralized carbonaceous slate	X		X	
27269	40-27	"	280.10-280.25	Altered milled breccia (uncertain protolith)	XX			

JCUNQ SAMPLE NUMBER	FIELD SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	OTS	PTS	DPB	ISO
27270	40-28	SHQ-79-40	281.73-281.80	Brecciated, altered and mineralized carbonaceous slate	X			
27271	40-29	"	281.80-282.04	Brecciated, altered and mineralized carbonaceous slate			XX	
27272	40-30	"	282.55-282.69	Brecciated, altered and mineralized carbonaceous slate				
27273	40-31	"	282.88-282.98	Massive quartz vein with abundant pyrite			X	Q
27274	40-32	"	286.25-286.38	Silicified laminated carbonaceous slate	X			
27275	40-33	"	293.90-294.17	Veined and altered, contact metamorphosed carbonaceous slate	X		X	
27276	40-34	"	294.60-294.77	Fractured, altered and mineralized carbonaceous slate				
27277	40-35	"	302.79-302.90	Brecciated (milled) and altered carbonaceous slate	X	ApChK		
27278	40-36	"	307.21-307.42	Brecciated (milled) and altered carbonaceous slate	X	ApBChD		
27279	40-37	"	310.38-310.51	Banded, altered, mineralized breccia (slate protolith?)				
27280	40-38	"	314.18-314.40	Brecciated and altered carbonaceous slate				
27281	40-39	"	316.18-316.30	Altered and mineralized milled breccia (uncertain protolith)	X	ChDM		
27282	40-40	"	316.60-316.80	Brecciated and altered carbonaceous slate				
27283	40-41	"	321.03-321.15	Veined to brecciated, altered carbonaceous slate	X	BCh		
27284	40-42	"	326.80-326.95	Brecciated, altered and mineralized carbonaceous slate	XX	ApChBK	X	
27285	40-43	"	329.00-329.32	Brecciated, altered and mineralized carbonaceous slate			X	K
27286	40-44	"	336.10-336.29	Brecciated (milled), altered and mineralized carbonaceous slate	X			
27287	40-45	"	347.06-347.17	Brecciated (milled), altered and mineralized carbonaceous slate	X	ChD		

APPENDIX C

ANALYTICAL TECHNIQUES FOR GEOCHEMICAL STUDIES

Mineral electron microprobe analyses

Following preliminary petrography to identify alteration phases and determine paragenetic relationships, samples for electron microprobe analysis were selected so that they:

(1) contained as many different alteration phases as possible, with clearly defined parageneses;
(2) encompassed as much of the prospect as possible, to test for possible geochemical zonation; and
(3) illustrated assemblages developed in different host lithologies.

Forty sections were eventually prepared for microprobe analysis (Table B2). These collectively contain eleven of the fifteen recognised alteration phases (discounting oxides of iron and base metal sulphides); *viz.* amphibole, garnet, epidote, biotite, K-feldspar, white mica, tourmaline, apatite, calcite, dolomite and chlorite. Quantitative mineral geochemical data for these phases were obtained using an energy dispersive spectrometer (EDS) on a JEOL JXA-840A EM Microanalyser (beam current 20 nA; accelerating voltage 15 kV; count time 100 seconds). Major and minor element contents were determined for each phase, including chlorine in hydroxyl-bearing species. In addition, the fluorine content of the apatites was obtained using a wavelength dispersive spectometer (WDS) concurrently with the EDS, under the same conditions.

Raw data were provided to two decimal places, with data corrected by on-board computer using the **ZAF** scheme. These data were transferred by hand to the database in the computer programme **MINFILE** (Afifi and Essene, 1988), and the mineral formulae calculated using subroutines within this programme.

Other phases which identified but not analysed in this study are diopside, scapolite, quartz and fluorite. Quartz and fluorite are assumed to be nearly pure SiO_2 and CaF_2, respectively. Analyses of the other two phases are listed in the data set of Ophel (1980), who also reports analyses of several of those phases which were examined in this study, and his data are used to supplement those obtained in this study. Unfortunately, Ophel (1980) did not cite the microprobe operating parameters he used.

Scott (1988) reports the results of mineral chemistry studies he made on samples from Mount Dore, mainly on phyllosilicates and sulphides. These data are incorporated herein, where relatively complete analyses are available. Scott (1988) used a CAMECA Camebax microprobe operating at 20 kV and 20 nA. Trace element (Ba, Co, Ni, Cu and Zn) contents of sulphides were determined with a 50nA beam and 100 second counting times. His results are presented in Tables 5.8 and 5.14.

Semi-quantitative SEM analyses

SEM analyses of daughter phases in fluid inclusions are based on the methods described by Metzger *et al.* (1977). Two samples (JCU-27086; JCU-27273) known to contain Type I multiphase solid inclusions were analysed. Sample JCU-27273 was also used in the volumetric study (Section 6.3), enabling a direct correlation with the results of the SEM study. Inclusion block off-cuts were broken at random, mounted edge-on upon an SEM stub using carbon cement, and inserted uncoated into the JXA-840A microprobe. Scans were conducted at low vacuum in back-scattered electron mode with an accelerating voltage of 15kV. Reconnaissance of the sample was done in scanning mode at relatively low magnification (<1000 times). When inclusions were detected, the magnification was increased accordingly. If daughters were present they were centred and analysed qualitatively for 30 seconds in spot mode. Results were plotted as X-ray spectra. Daughters from seventeen inclusions were analysed, and the peaks identified. Several inclusions were also photographed. The data are summarized in annotated photographic form in Figure 6.2, and characteristic XRD spectra are presented in Figure 6.3.

There are some limitations to this method. SEM X-ray analysis of the daughter phases can identify the major elements in them, but does not allow identification of the actual phases, nor does it indicate the hydration factor, where this may be important (such as in Fe- and Ca-chlorides). Water of hydration remains undetected, as do light elements such as carbon and fluorine. Furthermore, daughter phases located deep within an inclusion may produce low total counts, due to absorption of emitted X-rays by the host. This may be partly alleviated by rotating the specimen to improve the viewing angle. In many instances, however, no amount of rotation produced a satisfactory result, and the only option was to look elsewhere. Despite the limitations of the method, the results are of some value for confirming phase identifications made using optical properties. This is important for subsequent fluid geochemical calculations made using the volumetric data.

Fluid inclusion microthermometry

Preliminary reconnaissance of normal petrographic thin sections identified potentially useful samples. Those selected were prepared as doubly polished thick (up to 0.5 mm) sections, and searched for suitable inclusions. Chips about 5 x 5 mm in diameter containing clusters of inclusions were excised with a small diamond saw, and inclusions of interest were then classified and their distribution mapped. Twenty-eight primary inclusions from seven of these chips were subjected to detailed volumetric measurements of contained phases during this stage (Section 6.3; Appendix F).

Thermometric analyses were performed on a USGS gas-flow heating/freezing stage (described by Werre *et al.*, 1979). Eutectic, ice and clathrate melting temperatures were measured first, to obviate changes in physical properties arising from inclusion expansion during heating. Liquid nitrogen was used for cooling, and the temperature increased in freezing runs in a controlled manner by introducing compressed air. In heating runs, compressed air was used for temperatures below 500°C. Above 500°C nitrogen was used to prevent oxidation of the sample and stage, and silica windows were exchanged for those of glass, which tended to buckle at high temperatures. Gas was heated by a Sylvania flameless electric torch controlled by a variable resistance transformer and foot-pedal.

Temperatures were measured using a chromel thermocouple, calibrated prior to the study using CO_2 (-56.6°C), doubly distilled H_2O (0.0°C), sodium nitrate (306.8°C) and a variety of Merck standards (9700: 100°C; 9800: 200°C; 9847: 247°C; 9998: 398°C). Measured temperatures were accurate within 0.1°C at the low temperature end, and within 5°C at the high temperature end. The sample was secured to the stage by the tip of the thermocouple probe, which was never more than 1 mm from the area of the sample being observed, thereby reducing errors due to temperature gradients.

The heating rate was less than 2°C per minute during all runs. When approaching important transitions this rate was reduced to a few tenths of a degree per minute. Reproducibility of results for low salinity inclusions (those without daughter phases) was generally good ($\pm$ 0.2°C). High salinity inclusions were, however, prone to leaking, and in extreme cases decrepitation, and reproducibility of vapour homogenisation temperatures was poor. In no instance was a high salinity primary inclusion completely homogenised.

Semi-quantitative fluid inclusion volumetric measurements

The composition of the primary hydrothermal fluid has been semi-quantitatively estimated from the compositions of primary fluid inclusions, using an adaptation of the phase volume method descibed by Kwak and Tan (1981). Twenty-eight primary inclusions, each containing three or more daughter phases, were selected from seven samples (Table 6.3), on the basis of perceived early trapping, and therefore closest approach to the primary fluid composition. Micrometric measurements were made of each inclusion and its contained daughter and vapour phases. The shape of each inclusion was difficult to determine, but after careful examination was approximated as a collection of regular polyhedra. Daughters were identified using optical properties and semi-quantitative SEM X-ray spectral analysis (Section 6.2.2), and volumes were then relatively easily calculated from their known regular crystal habit. Masses of major components in each inclusion were then calculated using volumes and experimental solubility data for the (simplified) system. Concentrations of the major solute species in the original homogeneous fluid were then determined (see Appendix F for a full description of technique and documentation of results).

Systematic errors in measurement are comparatively small (± 0.25-0.5 µm), but is proportionately larger for smaller inclusions or daughters. Only inclusions larger than 10 to 15 µm in diameter were used. Very small daughters will not significantly contribute to the total volume of such inclusions. Systematic error is therefore considered to be relatively minor. Greater error arises from the estimation of shapes of inclusions and daughter phases, where these were indeterminate or irregular. Volumetric errors are quoted in Appendix F as ± 10%, but this is systematic error only, and quoted total inclusion volumes should not be considered more accurate than ± 20-30%.

Far greater, and inestimable, inaccuracies arise in the fluid composition calculations because of the necessary simplifications required in order to use existing experimental phase solubility data (Section 6.3.2). Final solute concentrations are therefore likely to be accurate only to within an order of magnitude.

Stable isotope analyses

Quartz, K-feldspar and carbonate separates were cut from the samples using a diamond microsaw attached to a dental drill, crushed in a cast iron mortar and pestle, sieved to obtain the 75 to 250 µm fraction, and hand-picked under a 10x incident light binocular microscope to obtain approximately 100 to 200 mg of each. Four of the quartz separates were further crushed in a TEMA ring mill, and came out grey, suggesting some contamination by iron from the mill. Although this should not affect the measured $\delta^{18}O$ isotope ratios, the remaining quartz, and all K-feldspar and carbonate samples underwent final crushing using an agate mortar and pestle. Contamination is expected to be volumetrically insignificant.

Biotite occurs finely intergrown with other alteration phases (carbonate, quartz and magnetite). After preliminary crushing and sieving, the 75 to 250 µm fraction was passed through a Frantz magnetic separator, first at low current (<0.5 D.C. amps) and relatively high side slope (25-30^{o}), to remove the magnetite, and then at higher current (1.7-1.8 D.C. amps), and lower forward and side slopes (15^{o}), to separate the completely non-magnetic phases (calcite and quartz with no attached biotite) from the biotite (with or without attached non-magnetic phases). To improve the biotite yield (probably less than 80% pure at this stage), the samples were further crushed (using an agate mortar and pestle) to be uniformly less than 100 µm, and passed through the magnetic separator at lower current (1.0 D.C. amp), and slightly higher side slope. This was done at least three times per sample, with intermediate further crushing, to achieve a final purity of perhaps better than 90%. No contaminant phase had hydrogen-bearing groups, however, and the relatively low purity should not have affected affect the biotite δD determinations.

100-200 mg of each mineral separate were bottled and sent to the Department of Geology and Mineralogy, University of Queensland for isotope extraction and measurement. Oxygen was extracted quantitatively from quartz and K-feldspar using BrF_5 and the technique of Clayton and Mayeda (1963). Silicate hydrogen was extracted using a modification of the technique of Coleman *et al.* (1982). Calcite and dolomite were reacted with phosphoric acid at 25^{o}C for one and three days, respectively, uisng the technique described by McCrea (1950). Acid fractionation factors used were 1.01025 (calcite; Sharma and Clayton, 1965) and 1.01179 (dolomite; Rosenbaum and Sheppard, 1986). Carbonate was identified as either calcite or dolomite by electron microprobe or X-ray diffractometry.

Oxygen and hydrogen isotope data are reported in permil relative to SMOW, with analytical uncertainty better than ± 0.2 permil for oxygen and ± 3 permil for hydrogen. Carbon isotope data are reported relative to PDB with an analytical uncertainty better than ± 0.1 permil (Sue Golding, University of Queensland, written communication, January 1992).

APPENDIX D

FULL MINERAL COMPOSITIONAL DATA FROM MICROPROBE ANALYSES

TABLE D1: List of samples collected and used by the author for determining alteration mineral chemistry by electron microprobe analysis, their localities, and a brief description (extracted from the complete sample list given in Table B2).

JCUNQ SAMPLE NUMBER	DRILLHOLE NUMBER	INTERVAL (m)	SAMPLE DESCRIPTION	PHASE[2]
27064	SMD-76-01[1]	54.19-54.31	Brecciated and altered quartz-muscovite schist	KMT
27077	SHQ-76-07	72.75-72.90	Altered and mineralized milled breccia	KMT
27097	SHQ-77-19	157.97-158.20	Brecciated and altered (?)siltstone	BDM
27099		164.42-164.51	Brecciated and altered (?)siltstone	AB
27102		169.30-169.39	Massive carbonate replacement of (?)siltstone breccia	ChDKT
27121		390.30-390.45	Altered milled breccia	ApT
27124	SHQ-78-23	57.70-57.80	Altered calc-silicate	CChKT
27130		70.27-70.43	Calcite veining in altered meta-siltstone	CChMT
27133		72.72-72.85	Altered meta-siltstone	CEGKT
27140		114.58-114.70	Biotite-carbonate-amphibole-quartz rock (altered breccia?)	BCCh
27141		117.40-117.48	Biotite-carbonate-amphibole-quartz rock (altered breccia?)	BT
27145		151.00-151.14	Brecciated and altered quartz-biotite phyllite	AApBT
27146		159.22-159.43	Altered quartz-biotite phyllite	ChDKMT
27156		196.00-196.14	Brecciated (milled) and altered phyllite	M
27158		210.86-210.96	Altered scapolitic meta-siltstone	ChDKM
27160		209.51-209.68	Altered metasiltstone	BT
27162		207	Quartz-tourmaline-carbonate rock (altered breccia?)	T
27175	SHQ-78-25	53.40-53.43	Brecciated and altered quartz-muscovite schist	KMT
27181	SHQ-78-27	177.50-177.65	Brecciated and altered Mount Dore Granite	ChKMT
27202		279.43-279.55	Brecciated, altered and mineralized carbonaceous slate	ApBCh

TABLE D1 (continued)

JCUNQ SAMPLE NUMBER	**DRILLHOLE NUMBER**	**INTERVAL (m)**	**SAMPLE DESCRIPTION**	**PHASE**
27211	SHQ-78-35	267.80-268.00	Brecciated (milled) and altered Mount Dore Granite	DKT
27220	"	374.74-374.82	Altered breccia (carbonaceous slate protolith?)	DT
27227	SHQ-78-38	239.47-239.81	Deformed and altered Mount Dore Granite	BChM
27231	"	241.84-242.11	Deformed Mount Dore Granite	BChK
27232	"	260.44-260.62	Deformed and altered Mount Dore Granite	T
27235	"	268.60-268.68	Deformed and altered Mount Dore Granite	M
27238	"	294.36-294.60	Veined and otherwise altered Mount Dore Granite	ApCChMT
27242	"	425.00-425.23	Milled and altered Mount Dore Granite breccia	DKT
27243	SHQ-79-40	127.00-127.10	Brecciated, altered and mineralized carbonaceous slate	ChKT
27277	"	302.79-302.90	Brecciated (milled) and altered carbonaceous slate	ApChK
27278	"	307.21-307.42	Brecciated (milled) and altered carbonaceous slate	ApBChD
27281	"	316.18-316.30	Altered and mineralized milled breccia (uncertain protolith)	ChDM
27283	"	321.03-321.15	Veined to brecciated, altered carbonaceous slate	BCh
27284	"	326.80-326.95	Brecciated, altered and mineralized carbonaceous slate	ApChBK
27287	"	347.06-347.17	Brecciated (milled), altered and mineralized carbonaceous slate	ChD

[1] Drillhole number is of the form "PROJECT PREFIX (SMD or SHQ) - YEAR (1976 to 1979) - HOLE NUMBER".
[2] PHASE: Refers to the alteration phases analysed by electron microprobe. Abbreviations used in this table for minerals analysed are as follows: A - amphibole, Ap - apatite, B - biotite, C - calcite, Ch - chlorite, D - dolomite, E - epidote, G - garnet, K - K-feldspar, M - muscovite, Q - quartz, T - tourmaline

TABLE D2: List of samples collected and used by Ophel (1980) for determining alteration mineral chemistry by electron microprobe analysis, their localities, and a brief description.

SYDNEY UNIV. CATALOGUE NUMBER	DRILLHOLE	DEPTH (m)	LITHOLOGY	MINERALS ANALYSED
59278	SHQ-77-38	462.65	Silicified carbonaceous slate	Ch,K,T
59284	SHQ-77-38	544.1	Calc-silicate shale breccia (brecciated and altered Staveley siltstones)	K,A,Ch
59287	SHQ-77-35	358.95	Siliceous carbonaceous slate	Ch,K
59288	SHQ-77-35	326.9	Siliceous feldspathised calcareous shale	C,B,T,D
59295	SHQ-78-38	570.8	Calc-silicate shale breccia	Sc,A,Di,E
59299	SHQ-78-38	497.65	Calc-silicate shale breccia	B,Ch
59306	SHQ-77-15	176.2	Chlorite-quartz-feldspar rock	Ch,K
59308	SHQ-77-23	68.3	Banded feldspar-chlorite-calcite-biotite rock	A,Ch
59313	SHQ-77-23	58.5	Banded feldspar-chlorite-calcite-biotite rock	Ch,A
59314	SHQ-77-23	69.15	Banded feldspar-chlorite-calcite-biotite rock	A,E,Ch
59315	SHQ-77-19	162.7	Chlorite schist breccia	Ch

Superscripts indicate the number of analyses done for each mineral phase considered in each sample
Mineral abbreviations: A - amphibole, B - biotite, Ch - chlorite, D - dolomite, E - epidote, K - K-feldspar, Sc - scapolite, T - tourmaline

Lithology identification is based on my drillcore logging or, where not logged, on the basis of company logs.

TABLE D3: List of samples collected and used by Scott (1988) for determining alteration mineral chemistry by electron microprobe analysis, their localities, and a brief description .

CSIRO CATALOGUE NUMBER	DRILLHOLE	DEPTH (m)	LITHOLOGY	MINERALS ANALYSED
101276	SHQ-76-8	110.4	Weathered brecciated carbonaceous slate	C,M
101292	SHQ-76-12	150.1	Silicified carbonaceous slate	Ch,M,K
101295	SHQ-76-12	166.3	Feldspathised and silicified sericite-chlorite schist	Ch,K
101330	SHQ-77-15	244.3	Chlorite-quartz-feldspar rock (altered Staveley Fm?)	Ch,B,K
101339	SHQ-77-16	103.4	Brecciated and altered quartz-muscovite schist	Ch,M,T,K
101340	SHQ-77-16	109	Brecciated and altered quartz-muscovite schist	Ch,K
101377	SHQ-77-19	283.4	Brecciated and altered quartz-muscovite schist	Ch,D,K
101383	SHQ-77-19	336.2	Quartz-muscovite phyllite	M,K
101405	SHQ-77-23	301.3	Silicified quartz-muscovite phyllite	D,M
101438	SHQ-77-29	130	Carbonaceous slate	M
101463	SHQ-77-31	275.7	Siliceous carbonaceous slate	Ch,K
101507	SHQ-78-39	286.8	Brecciated and altered quartz-muscovite schist	Ch,M,T,K
101509	SHQ-78-39	305.8	Chlorite-feldspar rock (cataclasite?)	Ch,K
101840	SHQ-78-30	352.8	Brecciated and altered quartz-muscovite schist	Ch,K
101841	SHQ-78-35	316	Brecciated and altered Staveley calcilutite	D

Mineral abbreviations: B - biotite, Ch - chlorite, D - dolomite, K - K-feldspar, T - tourmaline

Lithology identification is based on my drillcore logging or, where not logged, on the basis of company logs.

TABLE D4: Complete compositional data for amphiboles at Mount Dore. Structural formulae calculated on the basis of 24(O+OH+F+Cl). Samples with the prefix 59- are from the data set of Ophel (1980); localities and descriptions are given in Table D2.

TABLE D4: Amphibole

	27099 /1/1	**27099 /1/2**	**27099 /1/3**	**27099 /1/4**	**27099 /1/5**	**27121 /1/1**	**27121 /1/2**	**27121 /1/3**	**27121 /1/4**	**27121 /1/5**	**27121 /1/6**
SiO_2	53.21	56.29	54.44	51.57	55.34	55.56	54.99	53.7	54.73	55.06	51.98
TiO_2	0.1	0.16	-	0.16	-	-	-	-	-	-	-
Al_2O_3	2.51	1.49	1.92	3.59	2.09	1.17	2.85	0.89	1.87	0.91	2.48
Cr_2O_3	-	-	0.07	0.05	-	-	0.08	-	0.1	0.1	0.09
Fe_2O_3	-	-	-	0.01	-	-	-	-	-	-	-
FeO	10.28	8.47	9.62	10.15	8.62	9.01	9.36	8.44	8.96	12.98	9.29
MnO	0.18	0.16	0.09	0.38	0.17	0.41	0.31	0.37	0.43	1.44	0.44
MgO	16.99	18.87	17.55	15.48	18.61	18.32	18.2	17.64	17.72	14.64	16.84
CaO	12.51	12.84	12.73	12.2	12.66	13.12	12.94	12.88	12.86	12.64	12.53
Na_2O	0.66	0.64	0.57	0.55	0.51	0.34	0.6	0.23	0.43	-	0.4
K_2O	0.25	0.2	0.19	0.43	0.2	0.11	0.38	0.17	0.23	0.11	0.24
H_2O	2.05	2.14	2.1	2.00	2.11	2.12	2.15	2.03	2.09	2.08	2.02
Cl	0.1	0.06	-	0.11	0.1	-	-	0.05	0.08	-	0.04
O=Cl	-0.02	-0.01	-	-0.03	-0.02	-	-	-0.01	-0.02	-	-0.01
TOTAL	**98.82**	**101.31**	**99.27**	**96.65**	**100.39**	**100.16**	**101.86**	**96.39**	**99.48**	**99.96**	**96.34**
#Si IV	7.683	7.832	7.78	7.625	7.777	7.848	7.664	7.878	7.794	7.947	7.68
#Al IV	0.317	0.168	0.22	0.375	0.223	0.152	0.336	0.122	0.206	0.053	0.32
#Fe +3	-	-	-	-	-	-	-	-	-	-	-
#Ti IV	-	-	-	-	-	-	-	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Al VI	0.11	0.076	0.103	0.25	0.124	0.042	0.132	0.032	0.108	0.101	0.112
#Fe +3	-	-	-	0.001	-	-	-	-	-	-	-
#Ti	0.011	0.017	-	0.018	-	-	-	-	-	-	-
#Cr	-	-	0.008	0.006	-	-	0.009	-	0.011	0.011	0.011
#Mg	3.657	3.914	3.739	3.412	3.899	3.857	3.781	3.858	3.762	3.15	3.709
#Fe +2	1.222	0.986	1.15	1.255	0.977	1.064	1.077	1.036	1.067	1.567	1.148
#Mn	-	0.008	0.001	0.048	-	0.036	-	0.046	0.051	0.171	0.02
#Ca	-	-	-	0.011	-	-	-	0.028	-	-	-
M1,2,3	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**
#Mg	-	-	-	-	-	-	-	-	-	-	-
#Fe +2	0.02	-	-	-	0.036	-	0.014	-	-	-	-
#Mn	0.022	0.011	0.009	-	0.02	0.013	0.037	-	0.001	0.006	0.035
#Ca	1.935	1.914	1.949	1.922	1.906	1.985	1.932	1.996	1.962	1.955	1.965
#Na	0.023	0.075	0.041	0.078	0.038	0.001	0.018	0.004	0.037	-	-
M4 site	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**1.96**	**2.000**
#Ca	-	-	-	-	-	-	-	-	-	-	0.019
#Na	0.162	0.098	0.116	0.08	0.101	0.092	0.145	0.062	0.082	-	0.115
#K	0.046	0.035	0.035	0.081	0.036	0.02	0.068	0.032	0.042	0.02	0.045
A site	**0.208**	**0.133**	**0.151**	**0.161**	**0.137**	**0.112**	**0.212**	**0.093**	**0.123**	**0.02**	**0.178**
#O	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000
#OH	1.976	1.986	2.000	1.972	1.976	2.000	2.000	1.988	1.981	2.000	1.99
#Cl	0.024	0.014	-	0.028	0.024	-	-	0.012	0.019	-	0.01
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Cations	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**

TABLE D4: Amphibole (continued)

	27121 /1/6	**27121 /1/7**	**27121 /1/8**	**27121 /3/1**	**27121 /3/2**	**27121 /3/3**	**27121 /3/4**	**27130 /1/1**	**27130 /1/2**	**27130 /1/3**	**27130 /1/4**
SiO_2	54.53	54.95	53.91	56.84	55.82	54.49	54.31	53.51	52.79	52.59	51.13
TiO_2	0.23	0.09	-	-	0.09	0.19	-	-	-	-	-
Al_2O_3	0.52	1.22	3.05	0.55	0.96	2.09	2.33	2.54	2.27	2.63	3.71
Cr_2O_3	-	0.07	-	0.05	-	-	-	-	-	-	0.08
Fe_2O_3	-	-	-	-	-	-	-	-	-	-	-
FeO	8.99	9.16	9.54	9.69	13.38	9.32	8.92	12.06	16.17	12.94	13.71
MnO	2.98	0.26	0.31	0.22	1.6	0.27	0.45	0.2	0.18	0.17	0.08
MgO	15.8	18.03	17.43	18.31	14.65	18.01	17.89	15.89	13.35	15.22	14.79
CaO	12.41	13.03	12.67	13.02	12.11	12.92	12.72	12.44	11.54	12.23	12.1
Na_2O	-	0.42	0.44	0.16	0.29	0.45	0.49	0.68	0.88	0.69	1.04
K_2O	0.11	0.17	0.38	-	-	0.24	0.31	0.46	0.57	0.36	0.64
H_2O	2.04	2.09	2.09	2.14	2.1	2.12	2.09	2.07	1.99	2.04	2.0
Cl	0.05	0.07	0.08	-	-	-	0.06	0.07	0.2	0.07	0.18
O=Cl	-0.01	-0.02	-0.02	-	-	-	-0.01	-0.02	-0.05	-0.02	-0.04
TOTAL	**97.65**	**99.54**	**99.88**	**100.98**	**101.00**	**100.1**	**99.56**	**99.9**	**99.9**	**98.92**	**99.42**
#Si IV	7.974	7.825	7.669	7.952	7.969	7.724	7.732	7.705	7.746	7.68	7.496
#Al IV	0.026	0.175	0.331	0.048	0.031	0.276	0.268	0.295	0.254	0.32	0.504
#Fe +3	-	-	-	-	-	-	-	-	-	-	-
#Ti IV	-	-	-	-	-	-	-	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Al VI	0.063	0.03	0.18	0.043	0.13	0.073	0.123	0.136	0.138	0.133	0.137
#Fe +3	-	-	-	-	-	-	-	-	-	-	-
#Ti	0.025	0.01	-	-	0.01	0.02	-	-	-	-	-
#Cr	-	0.008	-	0.006	-	-	-	-	-	-	0.009
#Mg	3.444	3.828	3.696	3.819	3.118	3.806	3.797	3.411	2.92	3.314	3.233
#Fe +2	1.099	1.091	1.123	1.133	1.597	1.101	1.062	1.452	1.941	1.553	1.621
#Mn	0.368	0.031	-	-	0.145	-	0.018	0.001	-	-	-
#Ca	-	0.003	-	-	-	-	-	-	-	-	-
M1,2,3	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**
#Mg	-	-	-	-	-	-	-	-	-	-	-
#Fe +2	-	-	0.012	0.001	-	0.003	-	-	0.043	0.027	0.06
#Mn	0.002	-	0.037	0.026	0.048	0.032	0.036	0.023	0.022	0.021	0.01
#Ca	1.944	1.985	1.931	1.952	1.852	1.962	1.94	1.919	1.814	1.914	1.901
#Na	-	0.015	0.02	0.022	0.08	0.002	0.023	0.058	0.121	0.038	0.029
M4 site	**1.946**	**2.000**	**2.000**	**2.000**	**1.981**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**
#Ca	-	-	-	-	-	-	-	-	-	-	-
#Na	-	0.101	0.102	0.022	-	0.122	0.112	0.132	0.13	0.157	0.266
#K	0.021	0.031	0.069	-	-	0.043	0.056	0.084	0.107	0.067	0.12
A site	**0.021**	**0.132**	**0.17**	**0.022**	**-**	**0.165**	**0.168**	**0.217**	**0.236**	**0.224**	**0.386**
#O	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000
#OH	1.988	1.983	1.981	2.000	2.000	2.000	1.986	1.983	1.95	1.983	1.955
#Cl	0.012	0.017	0.019	-	-	-	0.014	0.017	0.05	0.017	0.04
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Cations	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**

TABLE D4: Amphibole (continued)

	27130 /4/1	**27130 /4/2**	**27130 /4/3**	**27133 /3/1**	**27133 /3/2**	**27133 /3/3**	**27133 /3/4**	**27141 /2/1**	**27141 /2/2**	**27141 /2/3**	**27141 /2/4**
SiO_2	55.8	53.59	54.92	55.29	53.21	51.21	55.38	59.44	59.15	58.41	58.5
TiO_2	-	-	-	-	-	-	0.07	-	-	-	-
Al_2O_3	0.45	0.86	1.2	0.66	2.46	3.87	0.82	-	-	0.45	-
Cr_2O_3	-	-	-	-	-	-	0.05	-	0.08	0.09	0.08
Fe_2O_3	-	-	-	-	-	-	-	-	-	-	-
FeO	12.94	17.85	12.52	12.72	11.17	12.2	11.56	1.92	2.75	1.86	2.04
MnO	1.23	1.0	1.01	0.91	0.9	0.85	0.82	0.16	-	0.08	-
MgO	15.15	11.78	14.96	15.1	18.87	17.86	16.17	23.51	23.37	23.33	23.52
CaO	12.54	12.34	12.64	12.62	10.21	9.52	12.68	13.65	13.61	13.36	13.44
Na_2O	0.33	0.18	0.28	0.12	0.15	0.28	0.3	-	0.08	0.23	0.12
K_2O	-	0.12	0.07	0.11	0.05	0.09	-	-	-	0.07	-
H_2O	2.09	2.03	2.06	2.08	2.09	2.05	2.08	2.22	2.22	2.2	2.18
Cl	-	-	0.07	-	-	-	0.05	-	-	-	0.06
O=Cl	-	-	-0.02	-	-	-	-0.01	-	-	-	-0.01
TOTAL	**100.53**	**99.75**	**99.72**	**99.61**	**99.12**	**97.93**	**99.97**	**100.9**	**101.26**	**100.08**	**99.93**
#Si IV	7.991	7.926	7.922	7.979	7.643	7.486	7.925	8.028	7.994	7.963	7.991
#Al IV	0.009	0.074	0.078	0.021	0.357	0.514	0.075	-	-	0.037	-
#Fe +3	-	-	-	-	-	-	-	-	-	-	-
#Ti IV	-	-	-	-	-	-	-	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.028**	**7.994**	**8.000**	**7.991**
#Al VI	0.067	0.076	0.126	0.091	0.06	0.153	0.064	-	-	0.035	-
#Fe +3	-	-	-	-	-	-	-	-	-	-	-
#Ti	-	-	-	-	-	-	0.008	-	-	-	-
#Cr	-	-	-	-	-	-	0.006	-	0.009	0.01	0.009
#Mg	3.234	2.597	3.217	3.249	4.041	3.892	3.45	4.734	4.708	4.742	4.789
#Fe +2	1.55	2.208	1.51	1.535	0.9	0.955	1.383	0.217	0.283	0.212	0.202
#Mn	0.148	0.119	0.123	0.111	-	-	0.09	0.018	-	0.001	-
#Ca	-	-	0.023	0.014	-	-	-	0.031	-	-	-
M1,2,3	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**
#Mg	-	-	-	-	-	-	-	-	-	-	-
#Fe +2	-	-	-	-	0.442	0.536	-	-	0.028	-	0.031
#Mn	0.001	0.006	-	-	0.109	0.105	0.009	-	-	0.008	-
#Ca	1.924	1.955	1.93	1.938	1.448	1.358	1.944	1.944	1.971	1.951	1.967
#Na	0.075	0.038	0.07	0.034	-	-	0.046	-	0.002	0.041	0.002
M4 site	**2.000**	**2.000**	**2.000**	**1.971**	**2.000**	**2.000**	**2.000**	**1.944**	**2.000**	**2.000**	**2.000**
#Ca	-	-	-	-	0.123	0.133	-	-	-	-	-
#Na	0.017	0.013	0.009	-	0.042	0.079	0.037	-	0.019	0.02	0.03
#K	-	0.023	0.013	0.02	0.009	0.017	-	-	-	0.012	-
A site	**0.017**	**0.036**	**0.022**	**0.02**	**0.174**	**0.229**	**0.037**	**-**	**0.019**	**0.032**	**0.03**
#O	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000
#OH	2.000	2.000	1.983	2.000	2.000	2.000	1.988	2.000	2.000	2.000	1.986
#Cl	-	-	0.017	-	-	-	0.012	-	-	-	0.014
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Cations	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**

TABLE D4: Amphibole (continued)

	27145 /1/1	**27145 /1/2**	**27145 /1/3**	**59284 /30**	**59284 /31**	**59284 /32**	**59284 /33**	**59284 /34**	**59295 /10**	**59295 /11**	**59295 /12**
SiO_2	57.53	55.08	56.18	55.07	55.48	53.12	53.29	46.01	53.99	54.85	53.88
TiO_2	-	0.15	0.15	0.03	0.02	0.17	0.19	0.03	0.02	-	-
Al_2O_3	0.37	2.92	1.37	1.36	1.18	2.99	3.04	6.08	0.64	0.42	0.88
Cr_2O_3	-	-	0.07	0.04	0.02	0.04	0.01	0.02	-	-	-
Fe_2O_3	-	-	-	-	-	-	-	-	-	-	-
FeO	4.78	5.9	6.32	8.06	8.3	9.31	9.38	11.08	8.92	8.28	11.57
MnO	-	0.24	0.33	0.46	0.34	0.65	0.62	0.51	0.01	0.11	0.3
MgO	21.66	19.69	20.26	19.46	18.75	17.83	18.06	19.65	17.92	18.12	17.58
CaO	13.21	12.83	12.74	13.33	12.71	12.74	12.93	8.76	13.27	13.16	13.27
Na_2O	0.34	0.47	0.46	0.22	0.17	0.42	0.43	0.09	0.17	0.11	0.09
K_2O	-	0.2	0.21	0.11	1.09	0.3	0.26	0.05	0.07	0.04	0.07
H_2O	2.17	2.14	2.15	2.12	2.12	2.08	2.11	1.97	2.05	2.06	2.08
Cl	-	-	-	0.02	0.01	0.06	-	0.01	0.03	0.03	0.02
O=Cl	-	-	-	-0.01	-0.002	-0.01	-	-0.002	-0.01	-0.01	-0.01
TOTAL	**100.06**	**99.62**	**100.24**	**100.28**	**100.19**	**99.67**	**100.32**	**94.26**	**97.08**	**97.17**	**99.73**
#Si IV	7.948	7.707	7.827	7.754	7.84	7.589	7.567	6.993	7.872	7.949	7.755
#Al IV	0.052	0.293	0.173	0.226	0.16	0.411	0.433	1.007	0.11	0.051	0.149
#Fe +3	-	-	-	-	-	-	-	-	-	-	-
#Ti IV	-	-	-	0.003	-	-	-	-	0.002	-	-
T site	**8.000**	**8.000**	**8.000**	**7.983**	**8.000**	**8.000**	**8.000**	**8.000**	**7.984**	**8.000**	**7.904**
#Al VI	0.008	0.189	0.052	-	0.037	0.092	0.076	0.082	-	0.021	-
#Fe +3	-	-	-	-	-	-	-	-	-	-	-
#Ti	-	0.016	0.016	-	0.002	0.018	0.02	0.003	-	-	-
#Cr	-	-	0.008	0.004	0.002	0.005	0.001	0.002	-	-	-
#Mg	4.461	4.107	4.208	4.085	3.95	3.797	3.823	4.45	3.895	3.915	3.772
#Fe +2	0.531	0.688	0.717	0.911	0.981	1.088	1.08	0.46	1.088	1.004	1.228
#Mn	-	-	-	-	0.028	-	-	-	0.001	0.014	-
#Ca	-	-	-	-	-	-	-	-	0.016	0.047	-
M1,2,3	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**
#Mg	-	-	-	-	-	-	-	-	-	-	-
#Fe +2	0.021	0.003	0.02	0.038	-	0.025	0.034	0.948	-	-	0.165
#Mn	-	0.028	0.039	0.055	0.013	0.079	0.075	0.066	-	-	0.037
#Ca	1.955	1.924	1.902	1.907	1.924	1.897	1.892	0.986	2.000	1.996	1.799
#Na	0.023	0.046	0.04	-	0.047	-	-	-	-	0.004	-
M4 site	**2.000**	**2.000**	**2.000**	**2.000**	**1.983**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**
#Ca	-	-	-	0.104	-	0.053	0.075	0.44	0.057	-	0.247
#Na	0.068	0.082	0.084	0.06	-	0.116	0.118	0.027	0.048	0.027	0.025
#K	-	0.036	0.037	0.02	0.197	0.055	0.047	0.01	0.013	0.007	0.013
A site	**0.068**	**0.118**	**0.122**	**0.184**	**0.197**	**0.224**	**0.241**	**0.476**	**0.118**	**0.034**	**0.285**
#O	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000
#OH	2.000	2.000	2.000	1.995	1.998	1.985	2.000	1.997	1.993	1.993	1.995
#Cl	-	-	-	0.005	0.002	0.015	-	0.003	0.007	0.007	0.005
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Cations	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**

TABLE D4: Amphibole (continued)

	59295 /13	**59295 /4**	**59295 /5**	**59295 /6**	**59295 /7**	**59295 /8**	**59295 /9**	**59308 /62**	**59308 /63**	**59308 /64**
SiO_2	56.47	53.37	54.12	52.47	52.54	52.11	54.53	53.73	54.16	52.53
TiO_2	0.04	0.01	0.06	0.08	0.09	0.03	0.02	0.07	0.05	0.16
Al_2O_3	1.46	0.94	0.44	1.6	1.6	1.65	0.46	1.41	1.26	2.6
Cr_2O_3	-	0.03	-	-	0.01	-	-	-	-	-
Fe_2O_3	-	-	-	-	-	-	-	-	-	-
FeO	11.91	11.45	10.6	12.45	12.4	10.99	9.56	11.69	11.57	10.35
MnO	0.33	0.15	0.07	0.06	0.07	0.09	0.11	0.09	0.1	0.1
MgO	17.74	17.29	18.22	16.95	16.86	16.86	18.2	17.4	17.13	17.81
CaO	13.76	13.0	13.33	13.08	13.02	12.81	13.25	12.8	12.8	12.34
Na_2O	0.26	0.26	0.13	0.41	0.32	0.31	0.17	-	-	0.34
K_2O	0.18	0.14	0.04	0.1	0.09	0.07	0.05	0.1	0.12	0.2
H_2O	2.17	2.06	2.07	2.05	2.05	2.03	2.07	2.08	2.08	2.05
Cl	0.04	0.03	0.04	0.05	0.05	-	0.03	-	-	0.09
O=Cl	-0.01	-0.01	-0.01	-0.01	-0.01	-	-0.01	-	-	-0.02
TOTAL	**104.35**	**98.72**	**99.11**	**99.29**	**99.08**	**96.95**	**98.45**	**99.37**	**99.27**	**98.55**
#Si IV	7.76	7.759	7.798	7.633	7.651	7.7	7.862	7.742	7.8	7.605
#Al IV	0.236	0.161	0.075	0.274	0.275	0.287	0.078	0.239	0.2	0.395
#Fe +3	-	-	-	-	-	-	-	-	-	-
#Ti IV	0.004	0.001	0.007	0.009	0.01	0.003	0.002	0.008	-	-
T site	**8.000**	**7.921**	**7.879**	**7.917**	**7.936**	**7.991**	**7.943**	**7.989**	**8.000**	**8.000**
#Al VI	-	-	-	-	-	-	-	-	0.013	0.049
#Fe +3	-	-	-	-	-	-	-	-	-	-
#Ti	-	-	-	-	-	-	-	-	0.005	0.017
#Cr	-	0.003	-	-	0.001	-	-	-	-	-
#Mg	3.634	3.747	3.914	3.676	3.66	3.714	3.912	3.737	3.678	3.844
#Fe +2	1.366	1.249	1.086	1.324	1.339	1.286	1.088	1.263	1.304	1.09
#Mn	-	-	-	-	-	-	-	-	-	-
#Ca	-	-	-	-	-	-	-	-	-	-
M1,2,3	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**
#Mg	-	-	-	-	-	-	-	-	-	-
#Fe +2	0.003	0.143	0.191	0.191	0.172	0.072	0.065	0.146	0.09	0.163
#Mn	0.038	0.018	0.009	0.007	0.009	0.011	0.013	0.011	0.012	0.012
#Ca	1.958	1.839	1.801	1.802	1.82	1.917	1.922	1.843	1.898	1.825
#Na	-	-	-	-	-	-	-	-	-	-
M4 site	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**
#Ca	0.067	0.186	0.257	0.237	0.212	0.111	0.125	0.133	0.077	0.089
#Na	0.069	0.073	0.036	0.116	0.09	0.089	0.048	-	-	0.095
#K	0.032	0.026	0.007	0.019	0.017	0.013	0.009	0.018	0.022	0.037
A site	**0.168**	**0.286**	**0.301**	**0.371**	**0.319**	**0.213**	**0.182**	**0.151**	**0.099**	**0.222**
#O	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000
#OH	1.991	1.993	1.99	1.988	1.988	2.000	1.993	2.000	2.000	1.978
#Cl	0.009	0.007	0.01	0.012	0.012	-	0.007	-	-	0.022
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Cations	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**

TABLE D4: Amphibole (continued)

	59308 /65	**59308 /66**	**59313 /25**	**59313 /26**	**59313 /27**	**59314 /100**	**59314 /98**	**59314 /99**
SiO_2	54.64	54.47	53.45	53.46	53.85	49.59	50.02	50.09
TiO_2	0.08	0.04	0.05	0.02	0.01	-	-	0.01
Al_2O_3	1.56	1.37	2.69	2.2	2.75	3.59	3.16	3.16
Cr_2O_3	-	-	-	-	-	-	-	-
Fe_2O_3	-	-	-	-	-	-	-	-
FeO	11.75	11.26	11.1	10.65	12.32	12.6	12.67	12.39
MnO	0.11	0.11	0.37	0.34	0.28	0.15	0.13	0.12
MgO	17.39	17.55	18.12	18.32	17.69	16.48	15.79	15.81
CaO	12.81	12.86	12.89	13.17	12.85	11.57	12.35	12.29
Na_2O	0.28	0.29	0.37	0.27	0.33	0.97	0.8	0.88
K_2O	0.12	0.14	0.28	0.22	0.27	0.1	-	0.11
H_2O	2.10	2.09	2.12	2.11	2.14	2.01	2.01	2.01
Cl	0.04	0.05	-	-	-	-	-	-
O=Cl	-0.01	-0.011	-	-	-	-	-	-
TOTAL	**100.87**	**100.22**	**101.44**	**100.76**	**102.49**	**97.06**	**96.93**	**96.87**
#Si IV	7.754	7.77	7.557	7.597	7.564	7.399	7.476	7.486
#Al IV	0.246	0.23	0.443	0.368	0.436	0.601	0.524	0.514
#Fe +3	-	-	-	-	-	-	-	-
#Ti IV	-	-	-	0.002	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**7.967**	**8.000**	**8.000**	**8.000**	**8.000**
#Al VI	0.015	-	0.005	-	0.019	0.03	0.033	0.042
#Fe +3	-	-	-	-	-	-	-	-
#Ti	0.009	0.004	0.005	-	0.001	-	-	0.001
#Cr	-	-	-	-	-	-	-	-
#Mg	3.679	3.732	3.819	3.881	3.704	3.665	3.518	3.522
#Fe +2	1.298	1.264	1.171	1.119	1.276	1.305	1.449	1.434
#Mn	-	-	-	-	-	-	-	-
#Ca	-	-	-	-	-	-	-	-
M1,2,3	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**	**5.000**
#Mg	-	-	-	-	-	-	-	-
#Fe +2	0.097	0.079	0.141	0.146	0.171	0.267	0.135	0.114
#Mn	0.013	0.013	0.044	0.041	0.033	0.019	0.016	0.015
#Ca	1.89	1.907	1.814	1.813	1.795	1.714	1.848	1.871
#Na	-	-	-	-	-	-	-	-
M4 site	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**
#Ca	0.058	0.058	0.138	0.193	0.138	0.136	0.129	0.097
#Na	0.077	0.08	0.101	0.074	0.09	0.281	0.232	0.255
#K	0.022	0.025	0.05	0.04	0.048	0.019	-	0.021
A site	**0.156**	**0.164**	**0.29**	**0.307**	**0.277**	**0.436**	**0.361**	**0.373**
#O	22.000	22.000	22.000	22.000	22.000	22.000	22.000	22.000
#OH	1.99	1.988	2.000	2.000	2.000	2.000	2.000	2.000
#Cl	0.01	0.012	-	-	-	-	-	-
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Cations	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**	**16.000**

TABLE D5: Complete compositional data for potassium feldspars at Mount Dore. Structural formulae calculated on the basis of eight oxygens per formula unit. Samples with the prefix 59- are from the data set of Ophel (1980); localities and brief descriptions are given in Table D2.

TABLE D5: Potassium feldspar

	27064 /3/1	**27064 /3/2**	**27064 /5/1**	**27064 /5/2**	**27064 /5/3**	**27077 /4/1**	**27077 /4/2**	**27077 /4/3**	**27102 /2/1**	**27102 /2/2**	**27102 /2/3**	**27124 /2/1**	**27124 /2/2**
SiO_2	64.34	64.33	64.24	64.22	64.45	63.7	62.69	63.22	64.94	64.47	64.59	63.39	63.75
Al_2O_3	18.83	18.16	18.51	18.53	18.38	18.3	17.96	17.95	18.01	18.02	17.75	17.61	17.95
FeO	0.17	0.15	-	0.1	-	-	1.17	0.37	-	-	-	-	0.14
CaO	0.26	0.19	0.13	0.13	0.21	0.15	0.23	0.14	0.14	0.17	0.08	-	0.14
BaO	0.8	0.65	0.23	0.41	0.41	0.78	1.03	0.52	0.15	0.2	0.2	0.22	0.39
Na_2O	0.5	0.42	0.31	0.39	0.52	0.45	0.35	0.19	0.72	0.48	0.7	0.31	0.3
K_2O	16.38	16.49	16.3	16.32	16.13	16.05	16.01	16.37	15.92	16.35	15.9	16.5	16.45
TOTAL	**101.28**	**100.39**	**99.72**	**100.1**	**100.1**	**99.43**	**99.44**	**98.76**	**99.88**	**99.69**	**99.22**	**98.03**	**99.12**
#/Si+4	2.964	2.987	2.986	2.981	2.988	2.982	2.962	2.984	3.007	2.999	3.012	3.004	2.992
#Al+3	1.022	0.994	1.014	1.014	1.004	1.01	1.0	0.999	0.983	0.988	0.976	0.983	0.993
#Fe+2	0.007	0.006	-	0.004	-	-	0.046	0.015	-	-	-	-	0.005
#Ca+2	0.013	0.009	0.006	0.006	0.01	0.008	0.012	0.007	0.007	0.008	0.004	-	0.007
#Ba+2	0.014	0.012	0.004	0.007	0.007	0.014	0.019	0.01	0.003	0.004	0.004	0.004	0.007
#Na+1	0.045	0.038	0.028	0.035	0.047	0.041	0.032	0.017	0.065	0.043	0.063	0.028	0.027
#K	0.963	0.977	0.966	0.966	0.954	0.959	0.965	0.986	0.94	0.97	0.946	0.997	0.985
# cations	**5.028**	**5.023**	**5.005**	**5.013**	**5.01**	**5.013**	**5.036**	**5.018**	**5.004**	**5.013**	**5.005**	**5.017**	**5.017**
charge	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000

	27124 /2/3	**27124 /4/1**	**27124 /4/2**	**27124 /4/3**	**27124 /4/4**	**27133 /2/1**	**27133 /2/2**	**27133 /2/3**	**27146 /3/1**	**27146 /3/2**	**27146 /3/3**	**27158 /4/2**	**27158 /4/3**
SiO_2	63.38	63.38	64.32	62.92	63.91	64.44	64.71	64.54	65.82	65.52	64.43	62.89	62.75
Al_2O_3	17.88	17.63	18.13	17.5	18.08	18.37	18.47	18.28	18.48	18.41	18.45	17.5	17.76
FeO	-	0.29	0.14	0.49	0.46	0.12	-	0.1	0.28	0.42	0.3	-	-
CaO	0.12	0.16	0.37	0.28	0.21	0.22	0.19	0.15	0.16	0.16	0.2	0.09	0.11
BaO	0.3	0.44	0.36	0.28	0.32	0.62	0.53	0.56	0.17	-	0.36	0.69	0.74
Na_2O	0.32	-	0.2	-	0.14	0.49	0.38	0.51	0.27	0.33	0.22	0.52	0.42
K_2O	16.41	16.04	16.35	15.87	16.17	15.72	15.43	14.73	14.74	14.89	15.97	15.93	16.24
TOTAL	**98.41**	**97.94**	**99.87**	**97.34**	**99.29**	**99.98**	**99.71**	**98.87**	**99.92**	**99.73**	**99.93**	**97.62**	**98.02**
#/Si+4	2.993	3.005	2.992	3.001	2.991	2.99	2.998	3.006	3.018	3.014	2.988	2.999	2.987
#Al+3	0.995	0.985	0.994	0.984	0.997	1.004	1.008	1.004	0.999	0.998	1.009	0.984	0.996
#Fe+2	-	0.011	0.005	0.02	0.018	0.005	-	0.004	0.011	0.016	0.012	-	-
#Ca+2	0.006	0.008	0.018	0.014	0.011	0.011	0.009	0.007	0.008	0.008	0.01	0.005	0.006
#Ba+2	0.006	0.008	0.007	0.005	0.006	0.011	0.01	0.01	0.003	-	0.007	0.013	0.014
#Na+1	0.029	-	0.018	-	0.013	0.044	0.034	0.046	0.024	0.029	0.02	0.048	0.039
#K	0.989	0.97	0.97	0.966	0.965	0.93	0.912	0.875	0.862	0.874	0.945	0.969	0.986
# cations	**5.018**	**4.988**	**5.005**	**4.99**	**5.0**	**4.995**	**4.971**	**4.953**	**4.925**	**4.939**	**4.99**	**5.018**	**5.027**
charge	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000

	27158 /4/4	**27175 /3/1**	**27175 /3/2**	**27175 /3/3**	**27181 /3/1**	**27181 /3/2**	**27181 /3/3**	**27181 /3/4**	**27211 /3/1**	**27211 /3/2**	**27211 /3/3**	**27231 /3/3**	**27231 /3/4**
SiO_2	62.98	64.55	64.48	64.58	64.27	63.86	55.86	62.97	63.23	62.55	62.42	66.72	64.51
Al_2O_3	18.08	18.15	18.8	18.29	18.2	18.34	16.01	17.99	17.76	17.32	17.64	18.68	17.75
FeO	0.14	0.1	0.15	-	0.17	0.32	12.4	1.75	0.19	0.1	0.13	-	0.1
CaO	0.06	0.18	0.15	0.21	0.18	0.13	0.1	0.14	0.12	0.14	0.07	0.16	0.08
BaO	0.98	0.24	0.69	0.14	0.21	0.51	-	0.37	-	-	0.16	-	-
Na_2O	0.54	0.53	0.2	0.21	0.22	0.3	-	0.11	0.92	0.96	0.81	0.75	0.61
K_2O	15.93	15.77	15.65	15.98	15.86	15.64	13.19	14.95	13.69	14.07	13.35	11.47	15.43
TOTAL	**98.71**	**99.52**	**100.12**	**99.41**	**99.11**	**99.1**	**97.56**	**98.28**	**95.91**	**95.14**	**94.58**	**97.78**	**98.48**
#/Si+4	2.978	3.0	2.983	3.001	2.999	2.987	2.812	2.978	3.015	3.017	3.016	3.056	3.018
#Al+3	1.008	0.994	1.025	1.002	1.001	1.011	0.95	1.003	0.998	0.985	1.005	1.008	0.979
#Fe+2	0.006	0.004	0.006	-	0.007	0.013	0.522	0.069	0.008	0.004	0.005	-	0.004
#Ca+2	0.003	0.009	0.007	0.01	0.009	0.007	0.005	0.007	0.006	0.007	0.004	0.008	0.004
#Ba+2	0.018	0.004	0.013	0.003	0.004	0.009	-	0.007	-	-	0.003	-	-
#Na+1	0.05	0.048	0.018	0.019	0.02	0.027	-	0.01	0.085	0.09	0.076	0.067	0.055
#K	0.961	0.935	0.924	0.947	0.944	0.933	0.847	0.902	0.833	0.866	0.823	0.67	0.921
# cations	**5.023**	**4.994**	**4.975**	**4.982**	**4.983**	**4.987**	**5.137**	**4.976**	**4.945**	**4.968**	**4.931**	**4.809**	**4.981**
charge	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000

TABLE D5: Potassium feldspar (continued)

	27231 /3/5	**27242 /2/1**	**27242 /2/2**	**27242 /2/3**	**27242 /2/4**	**27243 /1/1**	**27243 /1/2**	**27243 /1/3**	**27277 /2/1**	**27277 /2/2**	**27277 /2/3**	**27284 /2/1**	**27284 /2/2**
SiO_2	64.76	63.74	64.16	64.14	64.44	64.5	63.94	63.92	63.74	64.77	64.03	64.14	64.1
Al_2O_3	18.09	17.99	18.23	18.14	18.19	18.15	18.21	18.07	18.08	18.7	18.12	18.03	18.45
FeO	-	-	-	0.19	-	-	-	-	0.21	-	-	-	-
CaO	0.25	0.19	0.18	0.1	0.15	0.15	0.15	0.12	0.26	0.19	0.17	0.1	0.26
BaO	-	0.33	0.12	0.42	0.32	0.14	0.21	0.2	0.16	0.31	0.3	0.4	0.37
Na_2O	0.38	0.14	0.16	0.22	0.33	0.53	0.63	0.64	0.25	0.3	0.14	0.32	0.38
K_2O	14.86	16.43	15.18	15.95	16.19	16.04	15.96	16.19	16.5	16.17	15.93	15.4	15.47
TOTAL	**98.34**	**98.82**	**98.03**	**99.16**	**99.62**	**99.51**	**99.1**	**99.14**	**99.2**	**100.44**	**98.69**	**98.39**	**99.03**
#/Si+4	3.019	2.995	3.008	2.998	2.998	2.999	2.989	2.991	2.987	2.986	3.001	3.009	2.99
#Al+3	0.994	0.996	1.007	0.999	0.997	0.995	1.003	0.997	0.998	1.016	1.001	0.997	1.014
#Fe+2	-	-	-	0.007	-	-	-	-	0.008	-	-	-	-
#Ca+2	0.012	0.01	0.009	0.005	0.007	0.007	0.008	0.006	0.013	0.009	0.009	0.005	0.013
#Ba+2	-	0.006	0.002	0.008	0.006	0.003	0.004	0.004	0.003	0.006	0.006	0.007	0.007
#Na+1	0.034	0.013	0.015	0.02	0.03	0.048	0.057	0.058	0.023	0.027	0.013	0.029	0.034
#K	0.884	0.985	0.908	0.951	0.961	0.951	0.952	0.967	0.986	0.951	0.952	0.922	0.921
# cations	**4.943**	**5.005**	**4.949**	**4.988**	**4.999**	**5.003**	**5.013**	**5.023**	**5.019**	**4.995**	**4.981**	**4.968**	**4.98**
charge	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000

	27284 /2/3	**27284 /4/1**	**27284 /4/2**	**27284 /4/3**
SiO_2	64.5	64.65	63.91	63.35
Al_2O_3	18.25	18.42	18.4	17.93
FeO	-	-	0.12	-
CaO	0.14	0.23	0.14	0.29
BaO	0.27	0.24	0.4	0.25
Na_2O	0.57	0.19	0.65	0.91
K_2O	16.21	15.75	15.78	15.65
TOTAL	**99.94**	**99.48**	**99.4**	**98.38**
#/Si+4	2.993	2.999	2.982	2.987
#Al+3	0.998	1.007	1.012	0.996
#Fe+2	-	-	0.005	-
#Ca+2	0.007	0.011	0.007	0.015
#Ba+2	0.005	0.004	0.007	0.005
#Na+1	0.051	0.017	0.059	0.083
#K	0.96	0.932	0.939	0.941
# cations	**5.014**	**4.972**	**5.011**	**5.027**
charge	16.000	16.000	16.000	16.000

	59278 /57	**59278 /58**	**59284 /28**	**59284 /29**	**59287 /89**
SiO_2	62.18	63.08	62.99	72.65	64.3
Al_2O_3	17.55	17.71	20.05	20.28	17.25
FeO	0.09	0.05	0.1	0.12	-
CaO	0.02	0.03	0.03	0.02	0.1
BaO	-	-	-	-	-
Na_2O	0.22	0.17	-	0.16	0.16
K_2O	16.58	16.62	8.03	4.29	17.05
TOTAL	**96.64**	**97.66**	**91.2**	**97.52**	**98.86**
#Si+4	2.992	2.998	3.024	3.156	3.022
#Al+3	0.995	0.992	1.134	1.038	0.955
#Fe+2	0.004	0.002	0.004	0.004	-
#Ca+2	0.001	0.002	0.002	0.001	0.005
#Ba+2	-	-	-	-	-
#Na+1	0.021	0.016	-	0.013	0.015
#K+1	1.018	1.008	0.492	0.238	1.022
# cations	**5.03**	**5.017**	**4.655**	**4.451**	**5.019**
charge	16.000	16.000	16.000	16.000	16.000

	59287 /90	**59287 /91**	**59287 /92**	**59287 /93**	**59287 /94**	**59287 /95**	**59287 /96**	**59287 /97**	**59306 /85**
SiO_2	61.76	68.66	63.46	63.74	62.94	58.32	56.41	57.98	61.38
Al_2O_3	17.08	17.82	18.24	18.32	17.94	22.44	20.39	21.9	17.57
FeO	0.32	0.06	0.27	0.11	-	0.21	1.99	1.64	0.18
CaO	0.01	-	0.07	-	-	0.03	0.02	0.09	-
BaO	-	-	-	-	-	-	-	-	-
Na_2O	0.12	0.1	0.13	0.28	0.1	0.14	0.13	0.13	0.29
K_2O	16.15	13.86	16.77	16.86	17.07	14.91	13.46	14.84	16.17
TOTAL	**95.44**	**100.5**	**98.94**	**99.31**	**98.05**	**96.05**	**92.4**	**96.58**	**95.59**
#/Si+4	3.005	3.089	2.981	2.982	2.987	2.808	2.834	2.799	2.984
#Al+3	0.979	0.945	1.01	1.01	1.003	1.273	1.207	1.246	1.007
#Fe+2	0.013	0.002	0.011	0.004	-	0.008	0.084	0.066	0.007
#Ca+2	0.001	-	0.004	-	-	0.002	0.001	0.005	-
#Ba+2	-	-	-	-	-	-	-	-	-
#Na+1	0.011	0.009	0.012	0.025	0.009	0.013	0.013	0.012	0.027
#K	1.003	0.796	1.005	1.006	1.033	0.916	0.863	0.914	1.003
# cations	**5.012**	**4.841**	**5.022**	**5.029**	**5.033**	**5.02**	**5.001**	**5.041**	**5.028**
charge	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000

TABLE D6: Complete compositional data for white mica at Mount Dore. Structural formulae calculated on the basis of 24(O+OH+F+Cl) per formula unit.

TABLE D6: White mica

	27064 /4/1	27064 /4/2	27064 /4/3	27077 /2/1	27077 /2/2	27097 /3/1	27097 /3/2	27097 /3/3	27130 /3/5	27146 /2/1	27146 /2/2	27146 /2/3	27156 /2/1	27156 /2/2	27156 /2/3	27158 /3/1	27158 /3/2	27158 /3/3	27175 /1/1
SiO_2	47.31	47.27	48.08	55.11	55.31	55.42	52.85	55.75	52.19	45.07	46.2	46.83	51.89	52.96	52.15	47.69	48.26	48.06	48.03
TiO_2	0.31	0.44	0.59	-	-	-	0.07	-	-	0.31	0.14	0.34	-	-	0.07	0.37	0.81	0.52	0.46
Al_2O_3	38.48	37.42	37.35	29.64	30.36	22.93	24.94	23.29	27.94	37.28	37.71	37.64	31.51	32.69	31.15	35.45	35.23	35.29	38.34
Cr_2O_3	-	0.07	0.14	-	0.11	0.07	-	-	-	-	-	-	-	-	-	0.17	-	-	0.11
FeO	0.87	1.03	1.39	1.21	1.08	2.84	3.31	2.43	1.51	2.36	2.2	2.55	1.24	0.55	0.86	2.28	2.25	2.03	0.98
MnO	0.07	-	-	0.11	-	0.11	-	0.09	0.09	-	-	0.16	-	-	-	-	-	-	-
MgO	0.32	0.5	0.68	2.71	2.54	4.92	4.53	5.23	4.76	0.31	-	-	2.92	3.13	4.22	1.14	1.16	1.24	0.39
CaO	0.09	0.07	0.16	0.1	0.25	0.2	0.21	0.13	0.16	0.11	0.13	0.1	0.12	0.11	0.15	0.08	0.17	0.12	0.09
Na_2O	0.36	0.23	0.18	-	0.14	-	-	-	-	0.23	0.17	0.11	-	0.07	0.13	0.18	0.12	0.1	0.2
K_2O	9.62	8.83	9.18	5.75	5.52	9.84	9.8	8.16	7.5	9.44	9.35	8.95	8.2	7.87	7.52	8.71	8.4	8.1	8.16
H_2O	4.57	4.58	4.57	4.71	4.7	4.53	4.51	4.59	4.62	4.52	4.54	4.55	4.62	4.65	4.63	4.56	4.55	4.57	4.61
Cl	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	-	0.08	0.04	-
O=Cl	-	-	-	-	-0.01	-	-	-	-	-	-	-	-	-	-	-	-0.018	-0.01	-
TOTAL	**101.995**	**100.44**	**102.32**	**99.34**	**100.06**	**100.86**	**100.22**	**99.67**	**98.77**	**99.63**	**100.44**	**101.23**	**100.5**	**102.03**	**100.88**	**100.63**	**101.01**	**100.06**	**101.37**
#Si IV	6.088	6.154	6.163	7.068	7.032	7.268	7.009	7.304	6.869	5.998	6.072	6.100	6.706	6.694	6.687	6.237	6.272	6.285	6.159
#Al IV	1.912	1.846	1.837	0.932	0.968	0.732	0.991	0.696	1.131	2.002	1.928	1.900	1.294	1.306	1.313	1.763	1.728	1.715	1.841
#Ti IV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Al VI	3.924	3.896	3.806	3.548	3.581	2.812	2.907	2.900	3.202	3.845	3.914	3.878	3.505	3.565	3.395	3.700	3.668	3.724	3.954
#Ti VI	0.030	0.043	0.057	-	-	-	0.007	-	-	0.031	0.014	0.033	-	-	0.007	0.036	0.079	0.051	0.044
#Cr	-	0.007	0.014	-	0.011	0.007	-	-	-	-	-	-	-	-	-	0.018	-	-	0.011
#Fe +2	0.094	0.112	0.149	0.130	0.115	0.311	0.367	0.266	0.166	0.263	0.242	0.278	0.134	0.058	0.092	0.249	0.245	0.222	0.105
#Mn +2	0.008	-	-	0.012	-	0.012	-	0.010	0.010	-	-	0.018	-	-	-	-	-	-	-
#Mg	0.061	0.097	0.130	0.518	0.481	0.962	0.896	1.021	0.934	0.062	-	-	0.563	0.590	0.807	0.222	0.225	0.242	0.075
O site	**4.117**	**4.156**	**4.156**	**4.208**	**4.189**	**4.105**	**4.176**	**4.198**	**4.312**	**4.201**	**4.169**	**4.207**	**4.202**	**4.212**	**4.300**	**4.226**	**4.216**	**4.239**	**4.189**
#Ca	0.012	0.010	0.022	0.014	0.034	0.028	0.030	0.018	0.023	0.016	0.018	0.014	0.017	0.015	0.021	0.011	0.024	0.017	0.012
#Na	0.090	0.058	0.045	-	0.035	-	-	-	-	0.059	0.043	0.028	-	0.017	0.032	0.046	0.030	0.025	0.050
#K	1.579	1.467	1.501	0.941	0.895	1.646	1.658	1.364	1.259	1.603	1.568	1.487	1.352	1.269	1.230	1.453	1.393	1.351	1.335
A site	1.682	1.534	1.568	0.955	0.964	1.674	1.688	1.382	1.282	1.678	1.629	1.529	1.369	1.301	1.283	1.510	1.447	1.394	1.397
#O	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
#OH	4.000	4.000	4.000	4.000	3.991	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	3.982	3.991	4.000
#Cl	-	-	-	-	0.009	-	-	-	-	-	-	-	-	-	-	-	0.018	0.009	-
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
$Si/(Si+Al_{tet})$	0.761	0.769	0.770	0.883	0.879	0.909	0.876	0.913	0.859	0.750	0.759	0.762	0.838	0.837	0.836	0.780	0.784	0.786	0.770
K/(Ca+Na+K)	0.939	0.956	0.957	0.986	0.929	0.983	0.982	0.987	0.982	0.955	0.962	0.973	0.988	0.975	0.959	0.962	0.963	0.970	0.956
Mg/(Mg+Fe)	0.396	0.464	0.466	0.800	0.807	0.755	0.709	0.793	0.849	0.190	-	-	0.808	0.910	0.897	0.471	0.479	0.521	0.415

TABLE D6: White mica (continued)

	27175 /1/3	27175 /1/4	27181 /4/1	27181 /4/2	27181 /4/3	27181 /5/1	27227 /1/1	27227 /1/2	27227 /1/3	27235 /1/1	27235 /1/2	27235 /1/3	27235 /1/4	27238 /3/1	27238 /3/2	27238 /3/3	27281 /2/1	27281 /2/2	27281 /2/3
SiO_2	54.08	47.52	49.67	50.1	49.66	50.37	47.3	48.1	48.59	58.2	49.78	47.63	48.53	49.29	48.13	49.26	48.9	50.61	51.6
TiO_2	0.22	0.59	0.07	0.29	0.33	0.19	0.19	0.11	0.28	-	0.12	0.28	-	0.23	0.12	0.21	0.08	0.06	0.06
Al_2O_3	28.78	39.39	29.64	29.81	29.85	30.65	28.81	30.51	29.79	22.86	32.27	29.18	30.49	29.65	30.02	29.27	29.91	28.38	28.91
Cr_2O_3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.09	-	-	-	-
FeO	2.26	0.86	6.15	5.62	4.61	4.51	5.84	4.99	4.14	1.39	3.34	5.71	4.56	4.37	4.95	4.63	1.07	0.95	0.6
MnO	-	-	-	-	-	0.09	-	-	0.09	-	-	-	-	-	-	-	-	-	0.13
MgO	1.82	0.42	2.06	2.09	2.05	1.85	3.98	2.1	2.91	5.9	1.81	3.21	2.52	2.81	3.02	2.95	5.25	6.23	4.95
CaO	-	0.06	0.12	0.09	0.18	0.13	0.1	-	0.11	-	0.08	0.11	0.14	0.1	0.14	0.11	0.15	0.07	-
Na_2O	0.26	0.24	-	-	-	-	0.12	0.12	0.11	-	0.12	0.09	-	-	-	-	-	-	-
K_2O	11.78	8.78	8.06	8.04	8.17	8.29	8.68	8.74	8.54	7.46	8.98	8.98	8.71	8.49	8.73	8.31	10.32	10.13	9.17
H_2O	4.49	4.59	4.48	4.51	4.52	4.53	4.44	4.49	4.49	4.65	4.54	4.42	4.49	4.49	4.48	4.48	4.52	4.53	4.57
Cl	0.05	-	0.06	-	-	-	0.04	-	0.08	-	-	0.11	0.05	0.1	-	0.09	-	0.04	0.04
O=Cl	-0.01	-	-0.014	-	-	-	-0.01	-	-0.02	-	-	-0.03	-0.01	-0.023	-	-0.02	-	-0.01	-0.01
TOTAL	**103.73**	**102.45**	**100.29**	**100.55**	**99.37**	**100.61**	**99.49**	**99.16**	**99.11**	**100.46**	**101.04**	**99.7**	**99.48**	**99.5**	**99.68**	**99.3**	**100.2**	**100.99**	**100.03**
#Si IV	6.928	6.050	6.610	6.625	6.625	6.626	6.408	6.480	6.526	7.465	6.511	6.438	6.501	6.584	6.457	6.597	6.471	6.624	6.748
#Al IV	1.072	1.950	1.390	1.375	1.375	1.374	1.592	1.520	1.474	0.535	1.489	1.562	1.499	1.416	1.543	1.403	1.529	1.376	1.252
#Ti IV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Al VI	3.273	3.960	3.258	3.270	3.319	3.378	3.008	3.325	3.241	2.920	3.485	3.087	3.314	3.251	3.204	3.217	3.135	3.001	3.203
#Ti VI	0.021	0.056	0.007	0.029	0.033	0.019	0.019	0.011	0.028	-	0.012	0.028	-	0.023	0.012	0.021	0.008	0.006	0.006
#Cr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.010	-	-	-	-
#Fe +2	0.242	0.092	0.684	0.621	0.514	0.496	0.662	0.562	0.465	0.149	0.365	0.645	0.511	0.488	0.555	0.519	0.118	0.104	0.066
#Mn +2	-	-	-	-	-	0.010	-	-	0.010	-	-	-	-	-	-	-	-	-	0.014
#Mg	0.348	0.080	0.409	0.412	0.408	0.363	0.804	0.422	0.583	1.128	0.353	0.647	0.503	0.560	0.604	0.589	1.036	1.215	0.965
O site	**3.884**	**4.188**	**4.358**	**4.333**	**4.274**	**4.265**	**4.493**	**4.320**	**4.327**	**4.197**	**4.215**	**4.407**	**4.328**	**4.322**	**4.385**	**4.346**	**4.297**	**4.326**	**4.254**
#Ca	-	0.008	0.017	0.013	0.026	0.018	0.015	-	0.016	-	0.011	0.016	0.020	0.014	0.020	0.016	0.021	0.010	-
#Na	0.065	0.059	-	-	-	-	0.032	0.031	0.029	-	0.030	0.024	-	-	-	-	-	-	-
#K	1.925	1.426	1.368	1.356	1.391	1.391	1.500	1.502	1.463	1.221	1.498	1.548	1.488	1.447	1.494	1.420	1.742	1.691	1.530
A site	1.990	1.493	1.385	1.369	1.416	1.410	1.546	1.533	1.508	1.221	1.540	1.588	1.509	1.461	1.514	1.436	1.763	1.701	1.530
#O	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
#OH	3.989	4.000	3.986	4.000	4.000	4.000	3.991	4.000	3.982	4.000	4.000	3.975	3.989	3.977	4.000	3.980	4.000	3.991	3.991
#Cl	0.011	-	0.014	-	-	-	0.009	-	0.018	-	-	0.025	0.011	0.023	-	0.020	-	0.009	0.009
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
$Si/(Si+Al_{tet})$	0.866	0.756	0.826	0.828	0.828	0.828	0.801	0.810	0.816	0.933	0.814	0.805	0.813	0.823	0.807	0.825	0.809	0.828	0.843
K/(Ca+Na+K)	0.968	0.955	0.988	0.991	0.982	0.987	0.970	0.980	0.971	1.000	0.973	0.975	0.987	0.990	0.987	0.989	0.988	0.994	1.000
Mg/(Mg+Fe)	0.589	0.465	0.374	0.399	0.442	0.422	0.549	0.429	0.556	0.883	0.491	0.501	0.496	0.534	0.521	0.532	0.897	0.921	0.936

TABLE D7: Complete compositional data for tourmaline at Mount Dore. Structural formulae are calculated on the basis of 31(O+OH+Cl) per formula unit. All Fe is assumed to be FeO, Li_2O is assumed to be negligible. B_2O_3 abundance has been back-calculated assuming three boron atoms per formula unit. The amount of H_2O could not be assessed. Samples with the prefix 59- are from the data set of Ophel (1980); localities and brief descriptions are given in Table D2.

TABLE D7: Tourmaline

	27064 /1/1	27064 /1/2	27064 /1/3	27064 /1/4	27064 /1/5	27064 /2/1	27064 /2/2	27064 /2/3
SiO_2	36.31	36.54	36.53	37.26	36.53	36.44	36.25	36.55
TiO_2	1.65	1.64	1.38	0.66	1.41	0.12	0.5	0.61
B_2O_3	10.51	10.57	10.6	10.8	10.56	10.69	10.63	10.65
Al_2O_3	27.58	28.08	28.38	31.95	28.37	33.43	31.61	32.82
Cr_2O_3	-	-	0.22	-	-	-	-	-
FeO	8.61	8.48	7.61	6.18	8.52	8	7.9	7.05
MnO	-	-	-	-	-	-	-	-
MgO	9.17	8.99	9.22	8.34	8.77	6.15	7.28	6.49
CaO	1.12	0.88	1.6	0.35	0.68	0.56	1	0.48
Na_2O	2.29	2.43	1.92	2.3	2.58	2.13	2.19	2.04
K_2O	-	-	0.09	-	0.09	-	-	-
Cl	-	-	-	-	-	-	-	-
O=Cl	-	-	-	-	-	-	-	-
TOTAL	**97.24**	**97.61**	**97.55**	**97.84**	**97.51**	**97.52**	**97.36**	**96.69**
#Si+4	6.004	6.009	5.994	5.997	6.014	5.925	5.929	5.966
#Ti+4	0.205	0.203	0.170	0.080	0.175	0.015	0.061	0.075
#B	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001
#Al+3	5.375	5.442	5.488	6.061	5.504	6.406	6.093	6.313
#Cr+3	-	-	0.029	-	-	-	-	-
#Fe+2	1.191	1.166	1.044	0.832	1.173	1.088	1.081	0.962
#Mn+2	-	-	-	-	-	-	-	-
#Mg+2	2.261	2.204	2.255	2.001	2.152	1.491	1.775	1.579
#Ca+2	0.198	0.155	0.281	0.060	0.120	0.098	0.175	0.084
#Na+1	0.734	0.775	0.611	0.718	0.823	0.671	0.694	0.646
#K	-	-	0.019	-	0.019	-	-	-
#Cl	-	-	-	-	-	-	-	-
# cations	**18.970**	**18.954**	**18.892**	**18.751**	**18.981**	**18.693**	**18.810**	**18.625**
charge	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000
Mg/(Mg+Fe)	0.655	0.654	0.684	0.706	0.647	0.578	0.622	0.621
100Ti/(Ti+Al)	3.677	3.593	3.009	1.301	3.074	0.229	0.999	1.172
Ca/(Ca+Na)	0.213	0.167	0.315	0.078	0.127	0.127	0.201	0.115

	27064 /2/4	27064 /2/5	27064 /5/1	27064 /5/2	27064 /5/3	27077 /3/1	27077 /3/2
SiO_2	36.12	36.14	36.44	36.81	36.97	35.92	35.74
TiO_2	1.25	0.28	1.13	0.95	0.58	0.92	1.03
B_2O_3	10.6	10.64	10.6	10.7	10.77	10.35	10.37
Al_2O_3	30.97	34	29.71	29.87	31.62	27.46	27.69
Cr_2O_3	-	-	0.06	0.13	-	0.06	0.08
FeO	8.64	7.11	7.35	6.81	6.35	10.35	10.8
MnO	-	-	-	-	0.1	-	-
MgO	6.91	5.93	8.57	9.13	8.46	7.92	7.88
CaO	0.58	0.25	0.81	1.03	0.58	0.97	0.89
Na_2O	2.49	2.17	2.4	2.45	2.48	2.52	2.43
K_2O	-	-	0.06	0.06	-	0.07	-
Cl	-	0.03	-	-	-	-	-
O=Cl	-	-0.01	-	-	-	-	-
TOTAL	**97.56**	**96.54**	**97.13**	**97.94**	**97.91**	**96.54**	**96.91**
#Si+4	5.922	5.904	5.978	5.979	5.969	6.034	5.990
#Ti+4	0.154	0.034	0.139	0.116	0.070	0.116	0.130
#B	3.001	3.001	3.001	3.001	3.001	3.001	3.001
#Al+3	5.984	6.546	5.745	5.718	6.017	5.437	5.470
#Cr+3	-	-	0.008	0.017	-	0.008	0.011
#Fe+2	1.185	0.971	1.008	0.925	0.857	1.454	1.514
#Mn+2	-	-	-	-	0.014	-	-
#Mg+2	1.689	1.444	2.096	2.211	2.036	1.984	1.969
#Ca+2	0.102	0.044	0.142	0.179	0.100	0.175	0.160
#Na+1	0.791	0.687	0.763	0.772	0.776	0.821	0.790
#K	-	-	0.013	0.012	-	0.015	-
#Cl	-	0.010	-	-	-	-	-
# cations	**18.827**	**18.632**	**18.894**	**18.929**	**18.840**	**19.044**	**19.034**
charge	58.000	57.992	58.000	58.000	58.000	58.000	58.000
Mg/(Mg+Fe)	0.588	0.598	0.675	0.705	0.704	0.577	0.565
100Ti/(Ti+Al)	2.511	0.523	2.369	1.989	1.157	2.093	2.318
Ca/(Ca+Na)	0.114	0.060	0.157	0.189	0.114	0.175	0.168

	27077 /3/3	27077 /3/4	27077 /3/5	27077 /3/6	27102 /1/1	27102 /1/2	27102 /1/3
SiO_2	35.84	35.79	36.55	35.79	36.27	36.86	35.96
TiO_2	1.07	1.19	1.11	1.13	1.58	0.62	1.19
B_2O_3	10.36	10.35	10.6	10.41	10.51	10.72	10.39
Al_2O_3	27.55	27.34	29.3	27.88	27.99	31.34	27.36
Cr_2O_3	-	0.07	0.06	0.08	0.07	-	-
FeO	10.8	10.12	7.14	10.08	7.99	6.13	8.56
MnO	-	-	-	-	-	-	0.09
MgO	7.79	8.13	9.02	8.13	8.97	8.68	9.1
CaO	0.97	1.23	1.28	1.12	1.15	0.4	1.1
Na_2O	2.28	2.19	2.06	2.27	2.29	2.58	2.42
K_2O	0.07	0.11	-	0.05	0.04	0.08	0.11
Cl	0.04	-	-	-	0.06	-	-
O=Cl	-0.02	-	-	-	-0.03	-	-
TOTAL	**96.75**	**96.52**	**97.12**	**96.94**	**96.89**	**97.41**	**96.28**
#Si+4	6.017	6.011	5.993	5.979	6.003	5.976	6.015
#Ti+4	0.135	0.150	0.137	0.142	0.197	0.076	0.150
#B	3.001	3.001	3.001	3.001	3.002	3.001	3.001
#Al+3	5.451	5.411	5.662	5.489	5.460	5.989	5.393
#Cr+3	-	0.009	0.008	0.011	0.009	-	-
#Fe+2	1.516	1.421	0.979	1.408	1.106	0.831	1.197
#Mn+2	-	-	-	-	-	-	0.013
#Mg+2	1.949	2.035	2.205	2.025	2.213	2.098	2.269
#Ca+2	0.174	0.221	0.225	0.200	0.204	0.069	0.197
#Na+1	0.742	0.713	0.655	0.735	0.735	0.811	0.785
#K	0.015	0.024	-	0.011	0.008	0.017	0.023
#Cl	0.011	-	-	-	0.017	-	-
# cations	**19.001**	**18.997**	**18.863**	**19.001**	**18.937**	**18.867**	**19.043**
charge	57.989	58.000	58.000	58.000	57.983	58.000	58.000
Mg/(Mg+Fe)	0.563	0.589	0.692	0.590	0.667	0.716	0.655
100Ti/(Ti+Al)	2.418	2.702	2.360	2.521	3.477	1.247	2.700
Ca/(Ca+Na)	0.190	0.237	0.256	0.214	0.217	0.079	0.201

TABLE D7: Tourmaline (continued)

	27102 /1/4	**27102 /1/5**	**27102 /1/6**	**27102 /2/1**	**27102 /2/2**	**27102 /2/3**	**27102 /2/4**	**27102 /2/5**	**27102 /2/6**	**27121 /1/2**	**27121 /1/3**	**27145 /2/1**	**27145 /2/2**	**27145 /2/3**	**27145 /2/4**	**27146 /5/1**	**27146 /5/2**	**27146 /5/4**	**27146 /5/5**	**27160 /2/1**	**27160 /2/2**	**27162 /1/1**
SiO_2	36.57	36.37	36.34	36.37	36.41	36.73	36.92	36.2	36.48	36.28	36.47	35.6	35.86	35.89	36.72	36.57	36.49	36.13	36.11	36.6	36.36	36.31
TiO_2	0.72	0.87	0.57	1.37	1.3	0.97	0.38	0.75	0.86	0.81	0.7	0.71	0.38	0.42	0.31	0.2	0.37	0.66	0.56	0.22	0.4	0.26
B_2O_3	10.6	10.55	10.55	10.51	10.53	10.63	10.66	10.51	10.47	10.55	10.5	10.33	10.41	10.36	10.51	10.47	10.51	10.45	10.29	10.6	10.56	10.54
Al_2O_3	29.63	29.67	30.05	27.87	27.97	29.66	31.38	29.48	28.53	29.76	28.44	25.54	27.19	26.94	27.47	27.12	27.79	28.41	26.21	32.3	30.63	30.61
Cr_2O_3	0.19	0.13	0.09	-	0.07	0.08	0.09	-	-	-	0.06	0.07	0.04	-	-	0.1	-	0.1	-	0.18	-	-
FeO	7.51	6.74	7.19	8.22	8	8.07	5.89	7.3	8.17	8.2	8.93	11.34	8.46	9.28	8.74	11.14	9.6	9.75	11.07	10.61	6.31	9.9
MnO	-	-	-	-	0.09	-	-	0.14	-	-	-	0.09	0.11	-	0.08	-	-	-	-	-	-	-
MgO	8.74	8.78	8.67	9.01	9.17	8.28	8.49	8.83	8.49	8.26	8.69	9.46	9.95	9.45	9.74	8.87	9.29	8.23	8.6	4.95	8.49	6.53
CaO	0.72	0.88	0.51	1.41	1.33	0.79	0.27	0.64	0.75	0.53	0.67	2.78	2.67	2.41	2.03	1.1	1.25	1.04	1.59	0.08	0.69	1.45
Na_2O	2.45	2.45	2.47	2.21	2.3	2.55	2.42	2.5	2.56	2.63	2.55	1.39	1.51	1.54	1.53	2.42	2.3	2.22	1.93	2.25	2.71	1.9
K_2O	0.08	-	0.12	0.04	0.08	-	-	0.04	0.04	-	0.12	0.06	-	0.07	0.06	-	0.07	-	-	0.06	-	0.06
Cl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O=Cl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**97.21**	**96.44**	**96.56**	**97.01**	**97.25**	**97.76**	**96.5**	**96.39**	**96.35**	**97.02**	**97.13**	**97.37**	**96.58**	**96.36**	**97.19**	**97.99**	**97.67**	**96.99**	**96.36**	**97.85**	**96.15**	**97.56**
#Si+4	5.999	5.992	5.986	6.018	6.009	6.005	6.021	5.986	6.060	5.978	6.036	5.993	5.987	6.022	6.076	6.071	6.034	6.010	6.099	6.002	5.988	5.987
#Ti+4	0.089	0.108	0.071	0.170	0.161	0.119	0.047	0.093	0.107	0.100	0.087	0.090	0.048	0.053	0.039	0.025	0.046	0.083	0.071	0.027	0.050	0.032
#B	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001
#Al+3	5.729	5.761	5.834	5.435	5.440	5.715	6.032	5.745	5.585	5.779	5.547	5.067	5.350	5.328	5.357	5.306	5.416	5.569	5.217	6.242	5.945	5.949
#Cr+3	0.025	0.017	0.012	-	0.009	0.010	0.012	-	-	-	0.008	0.009	0.005	-	-	0.013	-	0.013	-	0.023	-	-
#Fe+2	1.030	0.929	0.990	1.137	1.104	1.103	0.803	1.009	1.135	1.130	1.236	1.596	1.181	1.302	1.209	1.547	1.328	1.356	1.564	1.455	0.869	1.365
#Mn+2	-	-	-	-	0.013	-	-	0.020	-	-	-	0.013	0.016	-	0.011	-	-	-	-	-	-	-
#Mg+2	2.137	2.156	2.129	2.223	2.256	2.018	2.064	2.177	2.102	2.029	2.136	2.374	2.477	2.364	2.403	2.195	2.290	2.041	2.165	1.210	2.084	1.605
#Ca+2	0.127	0.155	0.090	0.250	0.235	0.138	0.047	0.113	0.133	0.094	0.119	0.501	0.478	0.433	0.360	0.196	0.221	0.185	0.288	0.014	0.122	0.256
#Na+1	0.779	0.783	0.789	0.709	0.736	0.808	0.765	0.801	0.824	0.840	0.818	0.454	0.489	0.501	0.491	0.779	0.737	0.716	0.632	0.715	0.865	0.607
#K	0.017	-	0.025	0.008	0.017	-	-	0.008	0.008	-	0.025	0.013	-	0.015	0.013	-	0.015	-	-	0.013	-	0.013
#Cl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
# cations	**18.933**	**18.902**	**18.927**	**18.952**	**18.981**	**18.917**	**18.792**	**18.953**	**18.957**	**18.952**	**19.021**	**19.112**	**19.031**	**19.019**	**18.959**	**19.133**	**19.088**	**18.974**	**19.037**	**18.702**	**18.923**	**18.826**
charge	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000
Mg/(Mg+Fe)	0.675	0.699	0.682	0.661	0.671	0.647	0.720	0.683	0.649	0.642	0.634	0.598	0.677	0.645	0.665	0.587	0.633	0.601	0.581	0.454	0.706	0.540
100Ti/(Ti+Al)	1.527	1.837	1.196	3.041	2.880	2.044	0.767	1.597	1.887	1.707	1.546	1.743	0.884	0.985	0.715	0.468	0.842	1.461	1.345	0.433	0.826	0.539
Ca/(Ca+Na)	0.140	0.166	0.102	0.261	0.242	0.146	0.058	0.124	0.139	0.100	0.127	0.525	0.494	0.464	0.423	0.201	0.231	0.206	0.313	0.019	0.123	0.297

TABLE D7: Tourmaline (continued)

	27162 /1/2	**27162 /1/3**	**27162 /1/4**	**27162 /1/5**	**27162 /1/6**	**27162 /1/7**	**27162 /1/8**	**27175 /2/1**	**27175 /2/2**	**27175 /2/3**	**27175 /2/4**	**27175 /2/5**	**27175 /2/6**	**27181 /1/1**	**27181 /1/2**	**27181 /1/3**	**27181 /1/4**	**27181 /1/5**	**27211 /1/2**	**27211 /1/3**	**27211 /1/4**	**27211 /1/5**
SiO_2	36.43	36.47	36.86	37.03	36.24	36.81	36.04	36.51	35.86	36.23	36.07	36.13	36.55	35.62	36.09	35.9	35.95	36.13	34.75	34.22	34.42	33.78
TiO_2	1.5	0.96	0.82	0.23	0.72	0.47	0.63	0.69	1.65	0.48	1.22	0.7	0.54	1.43	0.63	1.05	1.07	0.9	0.84	0.88	0.86	0.88
B_2O_3	10.55	10.55	10.73	10.64	10.58	10.62	10.38	10.56	10.35	10.46	10.4	10.52	10.61	10.27	10.4	10.28	10.42	10.43	9.99	9.83	10.02	9.76
Al_2O_3	28.38	29.36	30.51	30.62	29.84	31.17	28.71	29.92	26.97	29.82	27.62	29.81	30.09	25.86	27.83	26.35	26.88	27.86	27.38	26.25	27.44	25.68
Cr_2O_3	0.07	-	0.13	0.08	0.09	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	0.05	-	-
FeO	8.36	7.68	6.07	6.62	7.55	5.96	11.76	6.95	9.47	8.46	9.43	8.29	8.44	10.42	10.06	8.99	9.41	9.6	8.05	8.65	7.6	9.51
MnO	-	-	-	0.1	-	-	0.15	-	0.12	0.08	-	-	-	-	-	-	-	0.12	0.08	-	-	-
MgO	8.62	8.54	9.33	8.69	8.83	8.32	6.37	8.56	8.39	7.8	8.4	8.06	8.21	8.69	8.3	9.11	9.32	8.44	7.81	7.76	8.52	7.93
CaO	0.94	0.61	0.73	0.39	0.64	0.35	0.67	0.72	1.23	0.32	0.98	0.71	0.54	1.99	1.19	1.83	1.76	1.11	0.92	1.16	1.04	1.42
Na_2O	2.43	2.62	2.45	2.42	2.66	2.53	2.45	2.58	2.18	2.49	2.38	2.52	2.61	1.8	2.14	1.81	2.17	2.26	2.26	2.32	2.38	1.99
K_2O	0.07	-	0.04	-	-	-	-	-	0.07	-	0.07	-	0.09	-	-	0.08	-	0.05	0.05	0.11	0.12	0.13
Cl	-	-	-	-	-	-	-	-	0.04	-	-	0.11	-	-	-	-	-	-	-	-	-	-
O=Cl	-	-	-	-	-	-	-	-	-0.02	-	-	-0.05	-	-	-	-	-	-	-	-	-	-
TOTAL	**97.35**	**96.79**	**97.67**	**96.82**	**97.15**	**96.23**	**97.16**	**96.49**	**96.31**	**96.14**	**96.57**	**96.8**	**97.68**	**96.18**	**96.74**	**95.4**	**96.98**	**96.9**	**92.13**	**91.23**	**92.4**	**91.08**
#Si+4	6.005	6.011	5.972	6.049	5.952	6.026	6.034	6.011	6.022	6.021	6.027	5.973	5.987	6.028	6.032	6.073	6.000	6.022	6.046	6.049	5.972	6.015
#Ti+4	0.186	0.119	0.100	0.028	0.089	0.058	0.079	0.085	0.208	0.060	0.153	0.087	0.067	0.182	0.079	0.134	0.134	0.113	0.110	0.117	0.112	0.118
#B	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.002	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001
#Al+3	5.514	5.703	5.826	5.895	5.776	6.014	5.665	5.806	5.338	5.840	5.439	5.809	5.809	5.158	5.482	5.253	5.288	5.473	5.614	5.469	5.611	5.389
#Cr+3	0.009	-	0.017	0.010	0.012	-	-	-	-	-	-	-	-	0.013	0.013	-	-	-	-	0.007	-	-
#Fe+2	1.152	1.059	0.822	0.904	1.037	0.816	1.647	0.957	1.330	1.176	1.318	1.146	1.156	1.475	1.406	1.272	1.313	1.338	1.171	1.279	1.103	1.416
#Mn+2	-	-	-	0.014	-	-	0.021	-	0.017	0.011	-	-	-	-	-	-	-	0.017	0.012	-	-	-
#Mg+2	2.118	2.098	2.253	2.116	2.162	2.031	1.590	2.101	2.100	1.932	2.092	1.987	2.005	2.192	2.068	2.297	2.319	2.097	2.026	2.045	2.204	2.105
#Ca+2	0.166	0.108	0.127	0.068	0.113	0.061	0.120	0.127	0.221	0.057	0.175	0.126	0.095	0.361	0.213	0.332	0.315	0.198	0.171	0.220	0.193	0.271
#Na+1	0.777	0.837	0.770	0.766	0.847	0.803	0.795	0.824	0.710	0.802	0.771	0.808	0.829	0.591	0.693	0.594	0.702	0.730	0.762	0.795	0.801	0.687
#K	0.015	-	0.008	-	-	-	-	-	0.015	-	0.015	-	0.019	-	-	0.017	-	0.011	0.011	0.025	0.027	0.030
#Cl	-	-	-	-	-	-	-	-	0.011	-	-	0.031	-	-	-	-	-	-	-	-	-	-
# cations	**18.943**	**18.936**	**18.896**	**18.853**	**18.988**	**18.810**	**18.952**	**18.912**	**18.963**	**18.900**	**18.992**	**18.938**	**18.966**	**19.000**	**18.988**	**18.972**	**19.072**	**18.999**	**18.924**	**19.006**	**19.023**	**19.031**
charge	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	57.989	58.000	58.000	57.969	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000
Mg/(Mg+Fe)	0.648	0.665	0.733	0.701	0.676	0.713	0.491	0.687	0.612	0.622	0.614	0.634	0.634	0.598	0.595	0.644	0.638	0.610	0.634	0.615	0.666	0.598
100Ti/(Ti+Al)	3.262	2.044	1.686	0.477	1.516	0.953	1.381	1.450	3.757	1.017	2.741	1.476	1.132	3.408	1.424	2.480	2.477	2.020	1.920	2.094	1.961	2.140
Ca/(Ca+Na)	0.176	0.114	0.141	0.082	0.117	0.071	0.131	0.134	0.238	0.066	0.185	0.135	0.103	0.379	0.235	0.358	0.309	0.213	0.184	0.216	0.195	0.283

TABLE D7: Tourmaline (continued)

	27211 /1/6	**27220 /1/1**	**27220 /1/2**	**27220 /1/3**	**27220 /1/3**	**27220 /1/4**	**27232 /1/1**	**27232 /1/10**	**27232 /1/2**	**27232 /1/3**	**27232 /1/4**	**27232 /1/5**	**27232 /1/6**	**27232 /1/7**	**27232 /1/8**	**27232 /1/9**	**27232 /1/1**	**27238 /2/1**	**27238 /2/10**	**27238 /2/11**	**27238 /2/2**	**27238 /2/3**
SiO_2	37.94	36.87	36.77	37.08	36.62	37.3	35.73	34.86	35.09	34.87	34.79	35.57	35.52	34.8	34.62	35.75	35.66	35.86	35.45	36.18	35.84	35.66
TiO_2	0.84	0.51	1.01	0.61	1.24	0.28	0.52	1.19	1.48	1.5	1.35	0.61	0.78	1.18	1.67	0.29	0.63	0.62	1.44	0.84	1.13	0.59
B_2O_3	10.02	10.73	10.72	10.81	10.67	10.85	10.42	10.08	10.07	9.97	10	10.39	10.29	10.02	9.91	10.37	10.32	10.38	10.17	10.4	10.35	10.29
Al_2O_3	25	32.13	31.11	32.6	30.16	33.01	29.31	25.4	24.73	24.22	24.48	29.33	28.05	25.52	23.59	30.47	28.7	27.87	24.89	26.96	27.51	28.28
Cr_2O_3	-	0.25	-	0.16	0.18	0.34	-	-	-	-	-	-	-	-	0.05	-	-	0.09	-	0.07	0.05	-
FeO	7.31	4.16	3.97	3.93	4.39	3.24	10.99	14.21	15.53	15.46	15.65	10.98	12.4	14.71	15.8	10.88	11.07	8.65	12.03	9.37	9.67	9.7
MnO	-	-	-	-	-	0.09	0.11	0.11	-	0.22	-	-	-	0.14	0.09	-	-	-	-	-	0.16	0.07
MgO	6.85	8.93	9.75	9.04	9.7	9.12	6.7	6.51	6.09	6.02	6.23	6.65	6.3	5.85	6.1	5.55	6.6	8.93	8.27	9.08	8.05	7.69
CaO	0.99	0.45	0.7	0.37	1.24	0.31	1.33	1.61	1.57	1.4	1.53	1.28	1.26	1.3	1.56	0.67	1.32	1.5	2.02	1.72	1.3	1.18
Na_2O	1.78	2.42	2.38	2.35	2.34	2.36	2.15	2.2	2.12	2.12	1.99	2.1	2.19	2.18	2.08	2.19	2.01	2.15	1.66	2.03	2.19	2.03
K_2O	1.1	0.04	0.14	0.05	0.04	-	-	0.07	-	0.12	0.17	0.04	0.05	-	0.08	0.07	-	0.04	0.08	0.04	0.08	-
Cl	0.08	-	-	-	-	0.06	-	-	-	0.04	-	-	-	-	-	0.07	-	-	-	-	-	-
O=Cl	-0.04	-	-	-	-	-0.03	-	-	-	-0.02	-	-	-	-	-	-0.03	-	-	-	-	-	-
TOTAL	**91.87**	**96.49**	**96.55**	**97**	**96.58**	**96.93**	**97.26**	**96.24**	**96.68**	**95.93**	**96.19**	**96.95**	**96.84**	**95.7**	**95.55**	**96.28**	**96.31**	**96.09**	**96.01**	**96.69**	**96.33**	**95.49**
#Si+4	6.584	5.972	5.963	5.962	5.965	5.981	5.961	6.014	6.057	6.079	6.047	5.951	5.999	6.041	6.074	5.996	6.006	6.005	6.061	6.047	6.020	6.022
#Ti+4	0.110	0.062	0.123	0.074	0.152	0.034	0.065	0.154	0.192	0.197	0.176	0.077	0.099	0.154	0.220	0.037	0.080	0.078	0.185	0.106	0.143	0.075
#B	3.002	3.001	3.001	3.001	3.001	3.002	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.002	3.001	3.001	3.001	3.001	3.001	3.001
#Al+3	5.114	6.134	5.946	6.178	5.790	6.238	5.763	5.165	5.031	4.976	5.015	5.783	5.583	5.221	4.878	6.023	5.697	5.501	5.016	5.311	5.446	5.629
#Cr+3	-	0.032	-	0.020	0.023	0.043	-	-	-	-	-	-	-	-	0.007	-	-	0.012	-	0.009	0.007	-
#Fe+2	1.061	0.564	0.538	0.528	0.598	0.434	1.533	2.050	2.242	2.254	2.275	1.536	1.751	2.135	2.318	1.526	1.559	1.211	1.720	1.310	1.358	1.370
#Mn+2	-	-	-	-	-	0.012	0.016	0.016	-	0.032	-	-	-	0.021	0.013	-	-	-	-	-	0.023	0.010
#Mg+2	1.772	2.156	2.357	2.167	2.356	2.180	1.666	1.674	1.567	1.564	1.614	1.659	1.586	1.514	1.595	1.388	1.657	2.229	2.108	2.262	2.016	1.936
#Ca+2	0.184	0.078	0.122	0.064	0.216	0.053	0.238	0.298	0.290	0.261	0.285	0.229	0.228	0.242	0.293	0.120	0.238	0.269	0.370	0.308	0.234	0.214
#Na+1	0.599	0.760	0.748	0.733	0.739	0.734	0.695	0.736	0.710	0.717	0.671	0.681	0.717	0.734	0.708	0.712	0.656	0.698	0.550	0.658	0.713	0.665
#K	0.244	0.008	0.029	0.010	0.008	-	-	0.015	-	0.027	0.038	0.009	0.011	-	0.018	0.015	-	0.009	0.017	0.009	0.017	-
#Cl	0.024	-	-	-	-	0.016	-	-	-	0.012	-	-	-	-	-	0.020	-	-	-	-	-	-
# cations	**18.669**	**18.767**	**18.829**	**18.736**	**18.849**	**18.711**	**18.939**	**19.124**	**19.090**	**19.108**	**19.122**	**18.925**	**18.974**	**19.061**	**19.126**	**18.819**	**18.894**	**19.013**	**19.029**	**19.020**	**18.976**	**18.921**
charge	57.976	58.000	58.000	58.000	58.000	57.984	58.000	58.000	58.000	57.988	58.000	58.000	58.000	58.000	58.000	57.980	58.000	58.000	58.000	58.000	58.000	58.000
Mg/(Mg+Fe)	0.626	0.793	0.814	0.804	0.798	0.834	0.521	0.450	0.411	0.410	0.415	0.519	0.475	0.415	0.408	0.476	0.515	0.648	0.551	0.633	0.597	0.586
100Ti/(Ti+Al)	2.099	1.003	2.029	1.180	2.556	0.538	1.119	2.903	3.678	3.801	3.399	1.310	1.743	2.866	4.322	0.604	1.381	1.400	3.560	1.949	2.554	1.314
Ca/(Ca+Na)	0.235	0.093	0.140	0.080	0.227	0.068	0.255	0.288	0.290	0.267	0.298	0.252	0.241	0.248	0.293	0.145	0.266	0.278	0.402	0.319	0.247	0.243

TABLE D7: Tourmaline (continued)

	27238 /2/4	**27238 /2/5**	**27238 /2/6**	**27238 /2/7**	**27238 /2/8**	**27238 /2/9**	**27238 /4/1**	**27238 /4/10**	**27238 /4/2**	**27238 /4/3**	**27238 /4/4**	**27238 /4/5**	**27238 /4/6**	**27238 /4/7**	**27238 /4/8**	**27238 /4/9**	**27242 /3/1**	**27242 /3/2**	**27242 /3/3**	**27242 /3/4**	**27242 /3/5**
SiO_2	35.47	36.09	35.69	34.95	35.72	35.73	35.85	36.19	36.27	35.33	36.4	35.04	36.21	35.71	35.58	35.42	35.82	35.62	36.23	35.74	36.18
TiO_2	1.25	1	0.84	1.3	1.31	1.39	0.99	0.6	0.53	1.29	0.86	1.43	0.42	1.06	1.25	1.41	1.06	0.94	1.08	0.9	0.92
B_2O_3	10.17	10.43	10.32	10.09	10.25	10.24	10.38	10.53	10.46	10.16	10.45	10.17	10.5	10.33	10.23	10.23	10.27	10.29	10.38	10.27	10.34
Al_2O_3	25.28	26.47	26.49	25.28	25.26	25.56	27.28	29.86	29.68	25.39	27.6	25.38	29.92	27.24	25.71	25.48	25.9	26.02	26.88	26.97	26.77
Cr_2O_3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	0.09	0.06	0.08	-	0.07
FeO	11.77	9.51	10.26	11.07	11.28	10.82	10.16	8.23	7.98	10.86	8.99	11.37	8.37	10.19	10.74	11.48	11.3	10.22	9.03	9.91	9.84
MnO	-	-	-	-	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MgO	8.25	9.61	9.09	8.31	8.52	8.51	8.41	8.15	7.96	8.45	8.94	8.53	7.99	8.16	8.58	8.41	8.37	9.15	8.91	8.37	8.48
CaO	1.91	2.2	2.01	1.99	2.1	2.01	1.5	0.7	0.72	2.02	1.52	1.98	0.6	1.54	2.01	1.96	1.72	2.2	1.66	1.32	1.63
Na_2O	1.72	1.98	1.71	1.9	1.9	1.72	2.18	2.53	2.39	1.92	1.97	1.85	2.51	2.05	1.68	1.96	1.79	1.8	2.05	2.13	1.96
K_2O	-	-	0.11	0.05	0.07	-	0.1	0.06	0.04	-	-	0.07	-	0.07	-	-	0.09	-	0.04	0.06	-
Cl	-	-	-	-	-	-	-	-	-	-	0.04	-	-	-	0.04	-	-	-	-	-	-
O=Cl	-	-	-	-	-	-	-	-	-	-	-0.02	-	-	-	-0.02	-	-	-	-	-	-
TOTAL	**95.82**	**97.29**	**96.52**	**94.94**	**96.49**	**95.98**	**96.85**	**96.85**	**96.03**	**95.42**	**96.75**	**95.82**	**96.52**	**96.35**	**95.86**	**96.35**	**96.41**	**96.3**	**96.34**	**95.67**	**96.19**
#Si+4	6.061	6.013	6.010	6.021	6.060	6.066	6.006	5.977	6.026	6.045	6.055	5.991	5.997	6.011	6.048	6.020	6.065	6.018	6.066	6.047	6.085
#Ti+4	0.161	0.125	0.106	0.168	0.167	0.177	0.125	0.075	0.066	0.166	0.108	0.184	0.052	0.134	0.160	0.180	0.135	0.119	0.136	0.115	0.116
#B	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.001
#Al+3	5.091	5.198	5.257	5.133	5.051	5.115	5.386	5.812	5.811	5.120	5.411	5.114	5.840	5.404	5.151	5.104	5.168	5.181	5.304	5.378	5.306
#Cr+3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008	-	0.012	0.008	0.011	-	0.009
#Fe+2	1.682	1.325	1.445	1.595	1.600	1.536	1.423	1.137	1.109	1.554	1.251	1.626	1.159	1.434	1.527	1.632	1.600	1.444	1.264	1.402	1.384
#Mn+2	-	-	-	-	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
#Mg+2	2.102	2.387	2.282	2.134	2.155	2.154	2.100	2.007	1.971	2.155	2.217	2.174	1.973	2.048	2.174	2.131	2.113	2.304	2.224	2.111	2.126
#Ca+2	0.350	0.393	0.363	0.367	0.382	0.366	0.269	0.124	0.128	0.370	0.271	0.363	0.106	0.278	0.366	0.357	0.312	0.398	0.298	0.239	0.294
#Na+1	0.570	0.640	0.558	0.635	0.625	0.566	0.708	0.810	0.770	0.637	0.635	0.613	0.806	0.669	0.554	0.646	0.588	0.590	0.665	0.699	0.639
#K	-	-	0.024	0.011	0.015	-	0.021	0.013	0.008	-	-	0.015	-	0.015	-	-	0.019	-	0.009	0.013	-
#Cl	-	-	-	-	-	-	-	-	-	-	0.011	-	-	-	0.012	-	-	-	-	-	-
# cations	**19.017**	**19.082**	**19.046**	**19.066**	**19.067**	**18.981**	**19.040**	**18.954**	**18.891**	**19.048**	**18.949**	**19.082**	**18.934**	**18.994**	**18.989**	**19.070**	**19.013**	**19.063**	**18.977**	**19.005**	**18.960**
charge	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	58.000	57.989	58.000	58.000	58.000	57.988	58.000	58.000	58.000	58.000	58.000	58.000
Mg/(Mg+Fe)	0.555	0.643	0.612	0.572	0.574	0.584	0.596	0.638	0.640	0.581	0.639	0.572	0.630	0.588	0.587	0.566	0.569	0.615	0.638	0.601	0.606
100Ti/(Ti+Al)	3.058	2.354	1.983	3.177	3.203	3.354	2.263	1.266	1.127	3.140	1.949	3.470	0.888	2.423	3.009	3.410	2.545	2.253	2.500	2.085	2.146
Ca/(Ca+Na)	0.380	0.380	0.394	0.367	0.379	0.392	0.275	0.133	0.143	0.368	0.299	0.372	0.117	0.293	0.398	0.356	0.347	0.403	0.309	0.255	0.315

TABLE D7: Tourmaline (continued)

	27242 /3/6	**27242 /3/7**	**27243 /2/1**	**27243 /2/2**	**27243 /2/3**	**27243 /2/4**	**27243 /2/5**	**59278 /59**	**59278 /60**	**59278 /61**	**59288 /45**	**59288 /46**	**59288 /47**
SiO_2	36.05	35.95	36.94	36.8	36.44	37.38	36.58	38.32	38.79	38.03	36.26	36.46	36.87
TiO_2	0.94	1.47	0.58	0.87	0.34	0.24	0.41	0.57	1.2	0.84	1.49	1.43	0.85
B_2O_3	10.4	10.35	10.68	10.63	10.56	10.88	10.58	11.65	11.69	11.56	10.43	10.61	10.5
Al_2O_3	27.58	26	30.93	29.4	31.27	33.05	29.51	36.86	35.08	36.08	27.85	28.8	28.27
Cr_2O_3	-	0.13	-	-	-	-	-	-	-	-	-	-	-
FeO	9.14	9.94	6.99	5.64	4.95	4.14	8.61	3.35	4.55	4.55	4.94	4.74	6.65
MnO	-	-	-	-	-	0.16	-	0.02	-	-	0.05	0.01	-
MgO	8.79	8.81	8.29	9.73	8.59	9.09	8.45	10.67	10.74	9.98	10.13	10.56	9.24
CaO	1.31	2.07	0.37	1.18	0.59	0.24	0.69	0.64	1.33	0.81	1.69	1.59	0.94
Na_2O	2.15	1.96	2.53	2.42	2.56	2.38	2.64	2.2	2.13	2.37	1.98	2.22	2.54
K_2O	0.08	-	-	0.11	-	-	0.06	0.04	-	0.01	0.04	0.03	0.03
Cl	-	-	0.04	-	0.05	-	-	-	-	-	-	0.01	0.16
O=Cl	-	-	-0.02	-	-0.02	-	-	-	-	-	-	-	-0.07
TOTAL	**96.44**	**96.68**	**97.33**	**96.78**	**95.33**	**97.56**	**97.53**	**104.32**	**105.51**	**104.23**	**94.86**	**96.46**	**95.98**
#Si+4	6.026	6.041	6.014	6.019	6.002	5.975	6.011	5.716	5.770	5.717	6.042	5.972	6.110
#Ti+4	0.118	0.186	0.071	0.107	0.042	0.029	0.051	0.064	0.134	0.095	0.187	0.176	0.106
#B	3.001	3.001	3.001	3.001	3.002	3.001	3.001	3.001	3.001	3.001	3.001	3.001	3.003
#Al+3	5.434	5.149	5.934	5.667	6.070	6.226	5.715	6.480	6.150	6.393	5.469	5.559	5.521
#Cr+3	-	0.017	-	-	-	-	-	-	-	-	-	-	-
#Fe+2	1.278	1.397	0.952	0.767	0.682	0.553	1.183	0.418	0.566	0.572	0.688	0.649	0.922
#Mn+2	-	-	-	-	-	0.022	-	0.003	-	-	0.007	0.001	-
#Mg+2	2.190	2.207	2.012	2.372	2.109	2.166	2.070	2.373	2.381	2.237	2.516	2.578	2.283
#Ca+2	0.235	0.373	0.065	0.207	0.104	0.041	0.121	0.102	0.212	0.130	0.302	0.279	0.167
#Na+1	0.697	0.639	0.799	0.767	0.818	0.738	0.841	0.636	0.614	0.691	0.640	0.705	0.816
#K	0.017	-	-	0.023	-	-	0.013	0.008	-	0.002	0.009	0.006	0.006
#Cl	-	-	0.011	-	0.014	-	-	-	-	-	-	0.003	0.045
# cations	**18.995**	**19.009**	**18.847**	**18.935**	**18.829**	**18.751**	**19.007**	**18.801**	**18.828**	**18.837**	**18.860**	**18.928**	**18.933**
charge	58.000	58.000	57.989	58.000	57.986	58.000	58.000	58.000	58.000	58.000	58.000	57.997	57.955
Mg/(Mg+Fe)	0.632	0.612	0.679	0.755	0.756	0.796	0.636	0.850	0.808	0.796	0.785	0.799	0.712
100Ti/(Ti+Al)	2.128	3.482	1.182	1.853	0.689	0.461	0.879	0.977	2.136	1.464	3.301	3.071	1.882
Ca/(Ca+Na)	0.252	0.369	0.075	0.212	0.113	0.053	0.126	0.138	0.257	0.159	0.320	0.284	0.170

TABLE D8: Complete compositional data for apatite at Mount Dore. Structural formulae are calculated on the basis of eight cations per formula unit. Note reduced totals for Cl and F analyses in Samples 27121/2/2 and /2/3, and 27277/3/15 and 3/16. These were tests of volatile "burn-off", where a number of analyses were made of the same spot on a specimen to test for loss of halogens through evaporation by the electron beam.

TABLE D8: Apatite

	27121 /2/1	27121 /2/2	27121 /2/3	27121 /2/4	27121 /2/5	27121 /2/6	27121 /2/7	27121 /2/8	27145 /3/1	27145 /3/2	27145 /3/3	27145 /3/4	27145 /3/5	27202 /5/1	27202 /5/2	27202 /5/3	27202 /5/4	27202 /5/5	27202 /5/6	27202 /5/7	27202 /5/8	27202 /5/9
FeO	-	-	0.17	0.09	-	-	-	-	-	0.21	-	-	-	0.12	-	-	-	-	0.17	-	0.21	-
MgO	0.07	-	-	-	-	-	0.1	0.06	-	-	-	-	0.11	0.1	0.07	0.09	0.08	-	0.21	0.11	0.15	-
CaO	56.02	58.03	57.93	56.38	56.31	56.19	56.39	56.48	56.42	56.25	55.99	54.94	56.48	55.03	55.26	54.99	55.79	55.71	55.83	56.24	56.39	56.1
Na_2O	-	-	0.11	0.21	-	0.1	0.16	0.21	-	-	0.15	-	0.15	-	0.12	-	-	0.17	0.12	-	-	0.11
P_2O_5	43.21	43.51	43.62	42.3	43.42	43.03	43.07	43.09	43.08	42.95	43.03	42.49	42.78	42.38	42.34	42.76	42.62	42.72	43.23	42.45	42.51	42.44
Cl	0.2	0.14	0.14	0.21	0.18	0.23	0.1	0.19	-	0.79	0.96	1.13	0.9	0.36	0.41	0.36	0.31	0.29	0.33	0.29	0.34	0.33
F	2.82	1.98	1.66	2.81	2.65	3.48	3.02	2.75	2.32	2.98	2.06	3.44	2.06	3.28	3.44	3.43	2.65	3.27	2.9	2.82	2.43	3.11
SUBTOTAL	102.32	103.66	103.63	102	102.56	103.03	102.84	102.78	101.82	103.18	102.19	102	102.48	101.27	101.64	101.63	101.45	102.16	102.79	101.91	102.03	102.09
O=Cl,F	-1.233	-0.865	-0.731	-1.231	-1.157	-1.517	-1.294	-1.201	-0.977	-1.433	-1.084	-1.704	-1.071	-1.462	-1.541	-1.526	-1.186	-1.442	-1.296	-1.253	-1.1	-1.384
TOTAL	**101.087**	**102.795**	**102.899**	**100.769**	**101.404**	**101.513**	**101.546**	**101.579**	**100.843**	**101.747**	**101.106**	**100.296**	**101.409**	**99.808**	**100.099**	**100.104**	**100.264**	**100.718**	**101.494**	**100.657**	**100.93**	**100.706**
#Fe+2	-	-	0.011	0.006	-	-	-	-	-	0.015	-	-	-	0.008	-	-	-	-	0.012	-	0.015	-
#Mg+2	0.009	-	-	-	-	-	0.012	0.007	-	-	-	-	0.013	0.013	0.009	0.011	0.010	-	0.026	0.014	0.018	-
#Ca+2	4.965	5.024	4.998	4.997	4.971	4.974	4.966	4.966	4.990	4.981	4.962	4.966	4.981	4.960	4.966	4.948	4.982	4.965	4.928	5.003	4.993	4.996
#Na+1	-	-	0.017	0.034	-	0.016	0.025	0.033	-	-	0.024	-	0.024	-	0.020	-	-	0.027	0.019	-	-	0.018
#P+5	3.026	2.976	2.974	2.963	3.029	3.010	2.997	2.994	3.010	3.005	3.013	3.034	2.981	3.019	3.006	3.040	3.008	3.008	3.015	2.984	2.974	2.986
# cations	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Cl	0.028	0.019	0.019	0.029	0.025	0.032	0.014	0.026	-	0.111	0.135	0.162	0.126	0.051	0.058	0.051	0.044	0.041	0.046	0.041	0.048	0.046
#F	0.738	0.506	0.423	0.735	0.691	0.909	0.785	0.714	0.606	0.779	0.539	0.918	0.536	0.873	0.912	0.911	0.699	0.860	0.756	0.740	0.635	0.818
#OH	0.234	0.475	0.558	0.235	0.284	0.058	0.201	0.260	0.394	0.110	0.326	-	0.338	0.076	0.029	0.038	0.258	0.099	0.198	0.219	0.317	0.136
X(Cl-ap)	0.028	0.019	0.019	0.029	0.025	0.032	0.014	0.026	-	0.111	0.135	0.150	0.126	0.051	0.058	0.051	0.044	0.041	0.046	0.041	0.048	0.046
X(F-ap)	0.738	0.506	0.423	0.736	0.691	0.910	0.785	0.714	0.606	0.779	0.539	0.850	0.536	0.873	0.913	0.911	0.698	0.860	0.756	0.740	0.635	0.818
X(OH-ap)	0.234	0.475	0.558	0.235	0.284	0.058	0.201	0.260	0.394	0.110	0.326	-	0.338	0.076	0.029	0.038	0.258	0.099	0.198	0.219	0.317	0.136

TABLE D8: Apatite (continued)

	27202 /5/10	**27202 /5/11**	**27202 /5/12**	**27238 /1/1**	**27238 /1/2**	**27238 /1/3**	**27238 /1/4**	**27238 /1/5**	**27238 /1/6**	**27238 /2/1**	**27238 /2/2**	**27238 /2/3**	**27238 /2/4**	**27238 /2/5**	**27238 /2/6**	**27238 /2/7**	**27238 /2/8**	**27238 /2/9**	**27238 /2/10**	**27238 /2/11**	**27238 /2/12**	**27238 /2/13**
FeO	-	0.1	0.15	-	-	-	-	-	-	-	-	0.16	-	-	0.12	0.19	0.11	-	-	-	-	-
MgO	-	0.06	-	-	-	0.07	0.11	-	-	-	-	-	-	-	-	-	0.09	-	0.11	-	-	-
CaO	56.38	55.62	55.72	55.55	55.29	55.91	55.44	55.02	54.97	54.97	55.25	56.63	56.38	55.31	55.44	55.21	55.1	56.1	57.33	57.5	56.27	57.31
Na_2O	-	0.16	-	0.1	-	0.17	0.25	-	-	0.12	0.14	-	0.1	-	-	0.22	0.12	0.12	-	0.13	-	-
P_2O_5	43.15	42.16	42.85	42.29	42.07	42.23	42.55	41.86	41.75	41.41	41.29	42.25	42.55	41.69	41.98	41.38	41.81	42.9	43.08	43.12	42	43.07
Cl	0.29	0.43	0.28	0.07	0.08	0.06	0.04	0.06	0.06	0.07	0.06	0.06	0.03	0.07	0.04	0.06	0.07	0.05	0.04	0.03	0.08	0.05
F	2.75	4.16	2.9	4.51	4.79	5.26	5.34	5.21	5.3	4.33	3.92	3.24	3	4.56	5.26	4.74	5.19	4.95	3.02	3.14	3.06	3.14
SUBTOTAL	102.57	102.69	101.9	102.52	102.23	103.7	103.73	102.15	102.08	100.9	100.66	102.34	102.06	101.63	102.84	101.8	102.49	104.12	103.58	103.92	101.41	103.57
O=Cl,F	-1.223	-1.849	-1.284	-1.915	-2.035	-2.229	-2.258	-2.207	-2.245	-1.839	-1.664	-1.378	-1.27	-1.936	-2.224	-2.01	-2.201	-2.096	-1.281	-1.329	-1.307	-1.334
TOTAL	**101.346**	**100.841**	**100.616**	**100.605**	**100.195**	**101.471**	**101.472**	**99.943**	**99.835**	**99.061**	**98.996**	**100.962**	**100.79**	**99.694**	**100.616**	**99.79**	**100.289**	**102.024**	**102.299**	**102.591**	**100.103**	**102.237**
#Fe+2	-	0.007	0.010	-	-	-	-	-	-	-	-	0.011	-	-	0.008	0.013	0.008	-	-	-	-	-
#Mg+2	-	0.007	-	-	-	0.009	0.014	-	-	-	-	-	-	-	-	-	0.011	-	0.013	-	-	-
#Ca+2	4.985	4.978	4.970	4.985	4.996	4.987	4.946	4.996	5.000	5.003	5.015	5.026	5.001	5.014	5.000	4.993	4.977	4.975	5.011	5.011	5.032	5.019
#Na+1	-	0.026	-	0.016	-	0.027	0.040	-	-	0.020	0.023	-	0.016	-	-	0.036	0.020	0.019	-	0.020	-	-
#P+5	3.015	2.982	3.020	2.999	3.004	2.977	3.000	3.004	3.000	2.978	2.962	2.963	2.983	2.986	2.992	2.957	2.984	3.006	2.975	2.969	2.968	2.981
# cations	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Cl	0.041	0.061	0.040	0.010	0.011	0.008	0.006	0.009	0.009	0.010	0.009	0.008	0.004	0.010	0.006	0.009	0.010	0.007	0.006	0.004	0.011	0.007
#F	0.718	1.099	0.763	1.195	1.278	1.385	1.406	1.397	1.423	1.163	1.050	0.849	0.786	1.220	1.400	1.265	1.384	1.296	0.779	0.808	0.808	0.812
#OH	0.242	-	0.197	-	-	-	-	-	-	-	-	0.143	0.210	-	-	-	-	-	0.215	0.188	0.181	0.181
X(Cl-ap)	0.041	0.053	0.040	0.008	0.009	0.006	0.004	0.006	0.006	0.009	0.008	0.008	0.004	0.008	0.004	0.007	0.007	0.005	0.006	0.004	0.011	0.007
X(F-ap)	0.717	0.947	0.763	0.992	0.991	0.994	0.996	0.994	0.994	0.991	0.992	0.849	0.786	0.992	0.996	0.993	0.993	0.995	0.779	0.808	0.808	0.812
X(OH-ap)	0.242	-	0.197	-	-	-	-	-	-	-	-	0.143	0.210	-	-	-	-	-	0.215	0.188	0.181	0.181

TABLE D8: Apatite (continued)

	27238 /2/14	**27238 /2/15**	**27238 /2/16**	**27238 /2/17**	**27238 /2/18**	**27277 /3/1**	**27277 /3/2**	**27277 /3/3**	**27277 /3/4**	**27277 /3/5**	**27277 /3/6**	**27277 /3/7**	**27277 /3/8**	**27277 /3/9**	**27277 /3/10**	**27277 /3/11**	**27277 /3/12**	**27277 /3/13**	**27277 /3/14**	**27277 /3/15**	**27277 /3/16**	**27278 /2/1**
FeO	-	0.12	-	-	-	0.19	-	0.09	0.17	-	-	0.17	-	0.16	-	-	0.1	-	-	-	-	-
MgO	0.06	-	-	-	-	0.15	0.13	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	0.08
CaO	55.07	54.73	57.43	56.69	57.24	54.24	53.86	55.03	54.46	55.14	53.54	53.71	54.49	53.98	54.18	55.4	54.94	55	54.4	55.67	56.72	54.21
Na_2O	-	0.23	-	0.12	-	-	0.21	-	0.16	-	-	-	-	0.16	0.11	-	0.1	-	-	-	0.14	-
P_2O_5	42.14	41.26	43.03	42.84	43.69	42.18	41.49	42.52	41.5	41.6	41.54	41.8	42.22	41.65	41.51	42.28	42.43	42.4	41.54	41.17	40.99	41.6
Cl	-	0.1	0.05	0.03	0.04	0.12	0.123	0.24	0.1	0.16	0.14	0.11	0.08	0.25	0.05	0.23	0.11	0.13	0.24	0.23	0.22	0.64
F	5.57	4.52	3.38	4.25	4.49	4.18	4.62	3.68	4.61	4.68	4.8	5.09	4.7	4.34	4.53	4.44	4.56	4.07	4.41	3.29	2.95	3.26
SUBTOTAL	102.84	100.96	103.89	103.93	105.46	101.06	100.433	101.56	101.14	101.58	100.02	100.88	101.49	100.54	100.38	102.35	102.24	101.6	100.59	100.36	101.02	99.79
O=Cl,F	-2.346	-1.926	-1.435	-1.796	-1.9	-1.787	-1.973	-1.604	-1.964	-2.007	-2.053	-2.168	-1.997	-1.884	-1.919	-1.922	-1.945	-1.743	-1.911	-1.437	-1.292	-1.517
TOTAL	**100.494**	**99.034**	**102.455**	**102.134**	**103.56**	**99.273**	**98.46**	**99.956**	**99.176**	**99.573**	**97.967**	**98.712**	**99.493**	**98.656**	**98.461**	**100.428**	**100.295**	**99.857**	**98.679**	**98.923**	**99.728**	**98.273**
#Fe+2	-	0.009	-	-	-	0.013	-	0.006	0.012	-	-	0.012	-	0.011	-	-	0.007	-	-	-	-	-
#Mg+2	0.008	-	-	-	-	0.019	0.017	-	0.018	-	-	-	-	-	-	-	-	-	-	-	-	0.010
#Ca+2	4.981	4.984	5.025	4.997	4.990	4.935	4.941	4.963	4.958	5.012	4.960	4.946	4.962	4.946	4.972	4.991	4.954	4.972	4.989	5.049	5.078	4.974
#Na+1	-	0.038	-	0.019	-	-	0.035	-	0.026	-	-	-	-	0.027	0.018	-	0.016	-	-	-	0.023	-
#P+5	3.012	2.969	2.975	2.984	3.010	3.032	3.008	3.030	2.986	2.988	3.040	3.042	3.038	3.016	3.010	3.009	3.023	3.028	3.011	2.951	2.900	3.016
# cations	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Cl	-	0.014	0.007	0.004	0.006	0.017	0.018	0.034	0.014	0.023	0.021	0.016	0.012	0.036	0.007	0.033	0.016	0.019	0.035	0.033	0.031	0.093
#F	1.487	1.215	0.873	1.106	1.155	1.123	1.251	0.980	1.239	1.256	1.312	1.384	1.263	1.174	1.227	1.181	1.214	1.086	1.194	0.881	0.780	0.883
#OH	-	-	0.120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.086	0.189	0.024
X(Cl-ap)	-	0.011	0.007	0.004	0.005	0.015	0.014	0.034	0.011	0.018	0.016	0.011	0.009	0.030	0.006	0.027	0.013	0.017	0.028	0.033	0.031	0.093
X(F-ap)	1.000	0.989	0.873	0.996	0.995	0.985	0.986	0.966	0.989	0.982	0.984	0.989	0.991	0.970	0.994	0.973	0.987	0.983	0.972	0.881	0.780	0.883
X(OH-ap)	-	-	0.120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.086	0.189	0.024

TABLE D8: Apatite (continued)

	27278 /2/2	**27278 /2/3**	**27278 /2/4**	**27278 /2/5**	**27278 /2/6**	**27278 /2/7**	**27278 /2/8**	**27278 /2/9**	**27278 /2/10**	**27278 /3/1**	**27278 /3/2**	**27278 /3/3**	**27278 /3/4**	**27278 /3/5**	**27278 /3/6**	**27278 /3/7**	**27278 /3/8**	**27284 /1/1**	**27284 /1/2**	**27284 /1/3**	**27284 /1/4**	**27284 /1/5**
FeO	0.27	-	0.11	0.19	0.43	0.27	-	0.11	0.16	-	0.15	-	-	0.28	-	0.21	-	-	0.13	0.19	-	-
MgO	-	0.1	-	-	-	-	0.06	0.17	0.12	-	0.09	-	-	0.12	-	-	-	-	-	-	-	-
CaO	53.84	54.46	54.12	54.2	54.86	55.24	54.81	54.66	54.59	55.7	53	55.04	53.82	55.72	54.6	53.74	54.58	55.4	55.55	55.17	55.15	55.51
Na_2O	0.15	0.09	-	0.13	0.11	-	-	-	-	-	0.09	-	-	0.16	-	-	-	-	0.16	-	-	-
P_2O_5	42.07	41.9	41.45	41.24	41.65	41.64	42.04	42.12	42.25	42.54	40.14	42.42	41.56	41.19	42.36	41.54	42.17	42.13	42.6	42.32	42.4	42.49
Cl	0.37	0.57	0.5	0.56	0.34	0.3	0.49	0.52	0.58	0.49	0.49	0.57	0.84	0.63	0.54	0.69	0.6	0.18	0.06	0.08	0.1	0.11
F	3.96	3.09	3.04	3.37	4.92	3.13	3.13	2.94	3.68	2.49	2.45	2.66	3.79	3.71	2.62	3.93	3.72	3.52	3.68	4.03	4.38	4.32
SUBTOTAL	100.66	100.21	99.22	99.69	102.31	100.58	100.53	100.52	101.38	101.22	96.41	100.69	100.01	101.81	100.12	100.11	101.07	101.23	102.18	101.79	102.03	102.43
O=Cl,F	-1.751	-1.43	-1.393	-1.545	-2.149	-1.386	-1.429	-1.355	-1.681	-1.159	-1.142	-1.249	-1.786	-1.704	-1.225	-1.811	-1.702	-1.523	-1.563	-1.715	-1.867	-1.844
TOTAL	**98.909**	**98.78**	**97.827**	**98.145**	**100.161**	**99.194**	**99.101**	**99.165**	**99.699**	**100.061**	**95.268**	**99.441**	**98.224**	**100.105**	**98.895**	**98.299**	**99.368**	**99.707**	**100.617**	**100.075**	**100.163**	**100.586**
#Fe+2	0.019	-	0.008	0.014	0.030	0.019	-	0.008	0.011	-	0.011	-	-	0.020	-	0.015	-	-	0.009	0.013	-	-
#Mg+2	-	0.013	-	-	-	-	0.008	0.021	0.015	-	0.012	-	-	0.015	-	-	-	-	-	-	-	-
#Ca+2	4.919	4.958	4.979	4.974	4.970	5.002	4.976	4.954	4.948	4.989	4.981	4.972	4.968	5.012	4.960	4.957	4.967	4.997	4.960	4.973	4.977	4.985
#Na+1	0.025	0.015	-	0.022	0.018	-	-	-	-	-	0.015	-	-	0.026	-	-	-	-	0.026	-	-	-
#P+5	3.037	3.014	3.013	2.991	2.982	2.979	3.016	3.017	3.026	3.011	2.981	3.028	3.032	2.927	3.040	3.028	3.033	3.003	3.005	3.014	3.023	3.015
# cations	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Cl	0.053	0.082	0.073	0.081	0.049	0.043	0.070	0.075	0.083	0.069	0.073	0.081	0.123	0.090	0.078	0.101	0.086	0.026	0.008	0.011	0.014	0.016
#F	1.068	0.830	0.826	0.913	1.316	0.837	0.839	0.787	0.985	0.658	0.680	0.709	1.033	0.985	0.702	1.070	0.999	0.937	0.970	1.072	1.167	1.145
#OH	-	0.087	0.102	0.006	-	0.120	0.091	0.139	-	0.272	0.247	0.209	-	-	0.220	-	-	0.037	0.022	-	-	-
X(Cl-ap)	0.047	0.082	0.073	0.081	0.036	0.043	0.070	0.075	0.078	0.069	0.073	0.081	0.106	0.084	0.078	0.086	0.079	0.026	0.008	0.010	0.012	0.014
X(F-ap)	0.953	0.831	0.825	0.913	0.964	0.837	0.839	0.786	0.922	0.659	0.680	0.710	0.894	0.916	0.702	0.914	0.921	0.937	0.970	0.990	0.988	0.986
X(OH-ap)	-	0.087	0.102	0.006	-	0.120	0.091	0.139	-	0.272	0.247	0.209	-	-	0.220	-	-	0.037	0.022	-	-	-

TABLE D8: Apatite (continued)

	27284 /1/6	27284 /1/7	27284 /1/8	27284 /1/9	27284 /1/10	27284 /1/11	27284 /1/12	27284 /1/13	27284 /1/14
FeO	0.14	0.16	0.16	-	0.24	-	0.1	-	-
MgO	-	-	0.07	-	0.08	-	-	-	-
CaO	55.17	55.09	55.52	54.57	55.33	54.94	55.15	55.25	55.53
Na_2O	-	-	-	0.15	-	-	-	-	0.11
P_2O_5	41.8	42.96	42.15	42.45	41.93	42.49	42.35	42.58	42.55
Cl	0.09	0.06	0.09	0.1	0.09	0.13	0.13	0.17	0.11
F	3.36	3.12	4.1	4.69	5.04	4.36	4.09	4	4.61
SUBTOTAL	100.56	101.39	102.09	101.96	102.71	101.92	101.82	102	102.91
O=Cl,F	-1.435	-1.327	-1.747	-1.998	-2.143	-1.865	-1.752	-1.723	-1.966
TOTAL	**99.125**	**100.063**	**100.343**	**99.962**	**100.567**	**100.055**	**100.068**	**100.277**	**100.944**
#Fe+2	0.010	0.011	0.011	-	0.017	-	0.007	-	-
#Mg+2	-	-	0.009	-	0.010	-	-	-	-
#Ca+2	4.998	4.943	4.988	4.939	4.987	4.966	4.975	4.972	4.972
#Na+1	-	-	-	0.025	-	-	-	-	0.018
#P+5	2.992	3.046	2.992	3.036	2.986	3.034	3.018	3.028	3.010
# cations	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Cl	0.013	0.009	0.013	0.014	0.013	0.019	0.019	0.024	0.016
#F	0.898	0.826	1.087	1.253	1.341	1.163	1.089	1.063	1.218
#OH	0.089	0.165	-	-	-	-	-	-	-
X(Cl-ap)	0.013	0.009	0.012	0.011	0.010	0.016	0.017	0.022	0.013
X(F-ap)	0.898	0.826	0.988	0.989	0.990	0.984	0.983	0.978	0.987
X(OH-ap)	0.089	0.165	-	-	-	-	-	-	-

TABLE D9: Complete compositional data for biotite at Mount Dore. Structural formulae have been calculated on the basis of 24(O+OH+Cl), using the MICA.EXE subroutine in MINFILE (Afifi and Essene, 1988). Chloritization of biotites analysed ranges from negligible to heavy. The latter is characterized by relatively high Mg^{2+} and low Fe^{2+}. Samples with the prefix 59- are from the data set of Ophel (1980); localities and brief descriptions are given in Table D2.

TABLE D9: Biotite

	27097 /1/1	27097 /1/2	27097 /1/3	27097 /1/4	27099 /3/1	27099 /3/2	27099 /3/3	27099 /4/1	27099 /4/2	27099 /4/3	27130 /3/2	27140 /1/1	27140 /1/2	27140 /1/4	27140 /2/1	27140 /2/2	27140 /3/1	27140 /3/2	27141 /1/1	27141 /1/2	27141 /1/3
SiO_2	39.94	34.09	36.17	39.27	48.07	43.78	39.02	39.9	38.16	39.67	46.78	39.36	39.34	38.88	38.69	41.49	39.32	38.71	40.15	37.97	39.26
TiO_2	0.88	1.16	1.8	1.09	-	0.2	0.15	0.73	0.35	0.72	-	1.04	0.92	1.17	1.22	0.09	1.28	1.01	0.9	0.95	0.26
Al_2O_3	18.28	15.27	15.27	18.36	22.34	21.21	15.39	14.56	15.86	15.8	25.36	14.17	14.57	14.2	14.67	12.14	13.91	14	15.4	14.81	11.74
Cr_2O_3	-	-	-	-	-	-	-	-	-	0.12	0.18	0.11	-	0.19	-	-	-	-	-	-	-
FeO	11.33	14.27	15.43	10.52	5.83	6.99	11.65	12.84	13.76	12.85	3.52	10.13	10.07	10.86	10.63	8.25	10.04	10.47	5.02	8.23	10
MnO	-	-	-	-	-	-	0.23	-	-	0.11	0.29	-	0.15	-	-	-	-	-	0.08	-	-
MgO	15.37	19.49	15.88	14.23	9.55	14.27	19.16	18.57	19.72	17.96	11.99	19.97	20.28	19.61	19.74	22.57	20.32	19.84	24.2	22.62	24.43
CaO	0.05	0.28	0.13	0.07	0.22	0.28	0.14	0.16	0.2	0.06	0.23	0.08	0.13	0.18	0.07	0.17	0.1	0.13	0.15	0.16	-
Na_2O	-	-	-	0.2	-	0.08	-	0.2	0.11	0.13	-	0.2	0.17	-	-	-	-	-	-	-	-
K_2O	5.27	6.04	10.1	7.35	6.41	3.86	8.74	9.74	7.35	9.87	5.27	9.89	9.97	9.92	9.81	9.77	10.04	10.49	10.35	9.63	8.22
H_2O	4.18	4.04	3.91	4.17	4.43	4.45	4.01	3.95	3.97	3.96	4.53	4.04	4.06	4.06	4.07	4.11	4.09	4.03	4.22	4.14	4.11
Cl	0.31	0.2	0.36	0.21	0.18	0.04	0.44	0.53	0.54	0.49	0.03	0.35	0.26	0.21	0.19	0.28	0.15	0.29	0.04	0.09	0.2
O=Cl	-0.07	-0.05	-0.08	-0.05	-0.04	-0.01	-0.1	-0.12	-0.12	-0.11	-0.01	-0.08	-0.06	-0.05	-0.04	-0.06	-0.03	-0.07	-0.01	-0.02	-0.05
TOTAL	**95.54**	**94.79**	**98.96**	**95.42**	**96.99**	**95.15**	**98.83**	**101.06**	**99.9**	**101.63**	**98.17**	**99.26**	**99.86**	**99.23**	**99.05**	**98.8**	**99.22**	**98.9**	**100.5**	**98.58**	**98.17**
#Si IV	5.884	5.279	5.480	5.853	6.648	6.201	5.735	5.789	5.567	5.719	6.303	5.761	5.722	5.714	5.682	6.023	5.753	5.721	5.663	5.552	5.770
#Al IV	2.116	2.721	2.520	2.147	1.352	1.798	2.265	2.211	2.433	2.281	1.697	2.239	2.278	2.286	2.318	1.977	2.247	2.279	2.337	2.448	2.034
#Ti IV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.029
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**7.832**
#Al VI	1.059	0.066	0.207	1.078	2.290	1.742	0.400	0.278	0.294	0.404	2.330	0.206	0.219	0.174	0.221	0.101	0.152	0.160	0.223	0.104	-
#Ti VI	0.097	0.135	0.205	0.122	-	0.021	0.017	0.080	0.038	0.078	-	0.114	0.101	0.129	0.135	0.010	0.141	0.112	0.095	0.104	-
#Cr	-	-	-	-	-	-	-	-	-	0.014	0.019	0.013	-	0.022	-	-	-	-	-	-	-
#Fe +2	1.396	1.848	1.955	1.311	0.674	0.828	1.432	1.558	1.679	1.549	0.397	1.240	1.225	1.335	1.306	1.002	1.229	1.294	0.592	1.006	1.229
#Mn +2	-	-	-	-	-	-	0.028	-	-	0.013	0.033	-	0.018	-	-	-	-	-	0.010	-	-
#Mg	3.376	4.500	3.587	3.162	1.969	3.013	4.198	4.016	4.289	3.860	2.408	4.358	4.397	4.297	4.322	4.885	4.432	4.371	5.088	4.930	5.353
O site	**5.928**	**6.549**	**5.954**	**5.673**	**4.933**	**5.605**	**6.075**	**5.932**	**6.300**	**5.918**	**5.188**	**5.931**	**5.960**	**5.957**	**5.984**	**5.997**	**5.954**	**5.938**	**6.008**	**6.145**	**6.582**
#Ca	0.008	0.046	0.021	0.011	0.033	0.042	0.022	0.025	0.031	0.009	0.033	0.013	0.020	0.028	0.011	0.026	0.016	0.021	0.023	0.025	-
#Na	-	-	-	0.058	-	0.022	-	5.626	0.031	0.036	-	0.057	0.048	-	-	-	-	-	-	-	-
#K	0.991	1.193	1.952	1.398	1.131	0.698	1.639	1.803	1.368	1.815	0.906	1.847	1.850	1.860	1.838	1.809	1.874	1.978	1.862	1.796	1.541
A site	**0.999**	**1.240**	**1.973**	**1.467**	**1.164**	**0.762**	**1.661**	**1.884**	**1.430**	**1.861**	**0.939**	**1.916**	**1.918**	**1.888**	**1.849**	**1.836**	**1.890**	**1.998**	**1.885**	**1.821**	**1.541**
#O	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
#OH	3.923	3.948	3.908	3.947	3.958	3.990	3.890	3.870	3.866	3.880	3.993	3.913	3.936	3.948	3.953	3.931	3.963	3.927	3.990	3.978	3.950
#Cl	0.077	0.052	0.092	0.053	0.042	0.010	0.110	0.130	0.134	0.120	0.007	0.087	0.064	0.052	0.047	0.069	0.037	0.073	0.010	0.022	0.050
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.707	0.709	0.647	0.707	0.745	0.784	0.746	0.721	0.719	0.714	0.859	0.778	0.782	0.763	0.768	0.830	0.783	0.772	0.896	0.830	0.813
$Si/(Si+Al_{tet})$	0.736	0.660	0.685	0.732	0.831	0.775	0.717	0.724	0.696	0.715	0.788	0.720	0.715	0.714	0.710	0.753	0.719	0.715	0.708	0.694	0.739

TABLE D9: Biotite (continued)

	27145 /4/1	**27145 /4/2**	**27145 /4/3**	**27160 /1/1**	**27160 /1/2**	**27160 /1/3**	**27160 /1/4**	**27202 /2/1**	**27202 /2/2**	**27202 /4/1**	**27202 /4/6**	**27227 /3/1**	**27227 /3/2**	**27227 /3/3**	**27231 /1/1**	**27231 /1/2**	**27231 /1/3**	**27231 /5/1**	**27231 /5/2**	**27231 /5/3**	**27281 /2/2**
SiO_2	37.05	39.42	39.41	44.51	33.47	35.74	38.93	40.67	40.51	40.12	39.36	38.4	38.8	38.55	38.62	39.42	38.59	38.63	39.19	38.12	41.36
TiO_2	1.19	1.06	1.75	0.33	0.64	1.45	0.12	0.29	0.55	0.11	0.09	2.29	2.71	5	1.83	1.6	1.95	2.25	1.85	2.14	0.88
Al_2O_3	13.42	12.72	13.09	20.85	18.17	17.81	20.17	13.21	12.73	12.62	12.75	13.98	14.83	12.66	14.31	13.14	13.44	13.97	13.68	13.21	12.2
Cr_2O_3	-	0.08	-	0.1	-	-	-	0.12	-	-	0.1	-	-	0.07	-	0.07	-	-	-	0.1	-
FeO	12.11	11.18	11.55	11.61	17.8	14.46	15.1	11.25	11.65	11.93	12.49	13.43	13.73	11.45	14.98	13.19	14.79	14.17	13.19	14.68	5.18
MnO	0.21	0.17	0.13	0.14	0.35	0.51	0.21	-	0.08	-	0.11	-	-	-	-	0.1	-	0.13	-	0.13	0.08
MgO	21.09	20.66	19.25	10.37	16.74	17.48	12.03	20.17	19.9	20.26	19.34	15.71	14.67	14.92	15.54	16.79	15.43	15.49	16.91	15.56	23.89
CaO	0.16	0.16	0.15	0.07	0.06	0.12	0.14	0.08	0.17	0.15	0.17	0.1	-	2.65	-	0.13	0.06	0.21	0.06	0.14	0.07
Na_2O	0.12	-	0.2	0.09	-	-	-	-	0.12	0.16	0.3	-	-	0.14	0.23	0.13	-	0.12	0.16	0.11	0.08
K_2O	6.92	8.37	9.63	4.89	2.26	4.67	3.82	9.97	9.69	9.04	9.63	10.46	10.54	9.11	10.6	10.61	10.59	10.68	10.83	10.63	10.73
H_2O	4.05	4.05	4	4.35	4.08	4.07	4.22	4.03	4.03	4	3.96	3.99	3.98	4.01	3.94	3.97	3.95	3.94	3.99	3.96	4.17
Cl	0.28	0.33	0.37	-	0.19	0.31	0.05	0.33	0.32	0.42	0.44	0.24	0.3	0.26	0.3	0.32	0.29	0.34	0.22	0.21	0.15
O=Cl	-0.06	-0.07	-0.08	-	-0.04	-0.07	-0.01	-0.07	-0.07	-0.09	-0.1	-0.05	-0.07	-0.06	-0.07	-0.07	-0.07	-0.08	-0.05	-0.05	-0.03
TOTAL	**96.54**	**98.12**	**99.45**	**97.31**	**93.72**	**96.55**	**94.78**	**100.05**	**99.67**	**98.72**	**98.64**	**98.54**	**99.49**	**98.76**	**100.28**	**99.4**	**99.02**	**99.85**	**100.03**	**98.94**	**98.76**
#Si IV	5.581	5.827	5.797	6.315	5.198	5.355	5.825	5.918	5.929	5.925	5.871	5.771	5.769	5.743	5.742	5.870	5.812	5.760	5.798	5.762	5.962
#Al IV	2.382	2.173	2.203	1.685	2.802	2.645	2.175	2.082	2.071	2.075	2.129	2.229	2.231	2.223	2.258	2.130	2.188	2.240	2.202	2.238	2.038
#Ti IV	0.037	-	-	-	-	-	-	-	-	-	-	-	-	0.035	-	-	-	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.001**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Al VI	-	0.044	0.067	1.801	0.523	0.500	1.382	0.183	0.125	0.121	0.112	0.247	0.367	-	0.250	0.176	0.198	0.215	0.183	0.115	0.035
#Ti VI	0.098	0.118	0.194	0.035	0.075	0.163	0.014	0.032	0.060	0.012	0.010	0.259	0.303	0.525	0.205	0.179	0.221	0.252	0.206	0.243	0.095
#Cr	-	0.009	-	0.011	-	-	-	0.014	-	-	0.012	-	-	0.008	-	0.008	-	-	-	0.012	-
#Fe +2	1.525	1.382	1.421	1.378	2.312	1.812	1.890	1.369	1.426	1.473	1.558	1.688	1.707	1.426	1.863	1.643	1.863	1.767	1.632	1.856	0.624
#Mn +2	0.027	0.021	0.016	0.017	0.046	0.065	0.027	-	0.010	-	0.014	-	-	-	-	0.013	-	0.016	-	0.017	0.010
#Mg	4.736	4.553	4.221	2.193	3.875	3.904	2.684	4.375	4.342	4.460	4.300	3.520	3.252	3.313	3.444	3.727	3.465	3.443	3.729	3.506	5.134
O site	**6.385**	**6.127**	**5.919**	**5.435**	**6.831**	**6.444**	**5.996**	**5.973**	**5.964**	**6.067**	**6.006**	**5.713**	**5.629**	**5.273**	**5.761**	**5.746**	**5.747**	**5.694**	**5.750**	**5.749**	**5.898**
#Ca	0.026	0.025	0.024	0.011	0.010	0.019	0.022	0.012	0.027	0.024	0.027	0.016	-	0.423	-	0.021	0.010	0.034	0.010	0.023	0.011
#Na	0.035	-	0.057	0.025	-	-	-	-	0.034	0.046	0.087	-	-	0.040	0.066	0.038	-	0.035	0.046	0.032	0.022
#K	1.330	1.579	1.807	0.885	0.448	0.893	0.729	1.851	1.809	1.703	1.832	2.005	1.999	1.731	2.011	2.016	2.035	2.032	2.044	2.050	1.973
A site	1.391	1.604	1.888	0.920	0.458	0.912	0.752	1.863	1.870	1.773	1.946	2.022	1.999	2.195	2.077	2.074	2.045	2.100	2.099	2.105	2.006
#O	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**	**20.000**
#OH	3.929	3.917	3.908	4.000	3.950	3.921	3.987	3.919	3.920	3.895	3.889	3.939	3.924	3.934	3.924	3.919	3.926	3.914	3.945	3.946	3.963
#Cl	0.071	0.083	0.092	-	0.050	0.079	0.013	0.081	0.079	0.105	0.111	0.061	0.076	0.066	0.076	0.081	0.074	0.086	0.055	0.054	0.037
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.756	0.767	0.748	0.614	0.626	0.683	0.587	0.762	0.753	0.752	0.734	0.676	0.656	0.699	0.649	0.694	0.650	0.661	0.696	0.654	0.892
$Si/(Si+Al_{tet})$	0.701	0.728	0.725	0.789	0.650	0.669	0.728	0.740	0.741	0.741	0.734	0.721	0.721	0.721	0.718	0.734	0.727	0.720	0.725	0.720	0.745

TABLE D9: Biotite (continued)

	27283 /2/1	**27283 /2/3**	**27284 /2/2**	**27284 /2/3**	**27284 /3/1**	**27284 /3/2**	**27284 /3/5**	**59288 /42**	**59288 /43**	**59288 /44**	**59299 /75**	**59299 /76**	**59299 /77**	**59299 /78**	**59299 /79**	**59299 /80**
SiO_2	38.25	40.69	34.46	36.72	41.35	39.76	38.57	38.1	39.25	38.84	36.72	34.8	37.88	38.29	42.14	42.38
TiO_2	1.28	0.85	0.39	0.6	0.88	0.49	0.8	0.61	0.61	0.64	0.61	1.8	-	-	1.61	2.08
Al_2O_3	13.5	12.82	15.76	14.14	12.67	14.29	12.97	12.93	13.49	12.99	15.6	15.37	12.7	12.99	13.89	13.18
Cr_2O_3	-	0.08	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-
FeO	7.83	6.16	11.39	8.57	6.09	8.17	6.62	9.84	10.14	9.52	13.79	19.66	15.27	15.15	15.6	14.89
MnO	-	-	0.18	-	-	-	-	0.1	0.09	0.11	0.2	0.26	0.08	0.04	0.09	0.06
MgO	21.09	23.58	22.47	23.92	23.37	21.07	21.53	23.67	24.03	24.13	16.84	15.32	16.3	16.69	19.48	17.75
CaO	0.4	0.12	-	0.08	0.13	0.12	0.08	-	0.01	0.05	0.03	0.01	-	0.04	-	-
Na_2O	0.11	0.18	-	0.27	-	-	-	0.08	0.04	0.11	0.14	-	0.02	0.05	-	-
K_2O	6.07	10.16	3.45	5.96	10.33	10.11	10.19	5.31	6.77	6.38	7.77	10.28	10	10.14	6.57	8.84
H_2O	4.24	4.16	4.2	4.19	4.16	4.12	4.14	4.24	4.13	4.15	4.02	3.91	3.78	3.8	4.14	4.11
Cl	0.09	0.15	0.08	0.13	0.19	0.2	0.17	-	0.25	0.23	0.27	-	0.83	0.78	-	-
O=Cl	-0.02	-0.03	-0.02	-0.03	-0.04	-0.05	-0.04	-	-0.06	-0.05	-0.06	-	0.19	-0.18	-	-
TOTAL	**92.84**	**98.92**	**92.37**	**94.55**	**99.13**	**98.28**	**95.03**	**94.87**	**98.75**	**97.1**	**95.98**	**101.41**	**96.67**	**97.79**	**103.52**	**103.29**
#Si IV	5.816	5.870	5.311	5.521	5.943	5.818	5.832	5.700	5.680	5.702	5.613	5.260	5.879	5.863	5.882	5.985
#Al IV	2.184	2.130	2.689	2.479	2.057	2.182	2.168	2.280	2.301	2.247	2.387	2.738	2.121	2.137	2.118	2.015
#Ti IV	-	-	-	-	-	-	-	0.020	0.019	0.051	-	0.002	-	-	-	-
T site	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**	**8.000**
#Al VI	0.235	0.049	0.174	0.027	0.089	0.283	0.144	-	-	-	0.423	-	0.202	0.207	0.167	0.178
#Ti VI	0.146	0.092	0.045	0.068	0.095	0.054	0.091	0.049	0.048	0.020	0.070	0.203	-	-	0.169	0.221
#Cr	-	0.009	-	-	-	-	-	-	-	-	0.006	-	-	-	-	-
#Fe +2	0.996	0.743	1.468	1.078	0.732	1.000	0.837	1.231	1.227	1.169	1.763	2.485	1.982	1.940	1.821	1.758
#Mn +2	-	-	0.023	-	-	-	-	0.013	0.011	0.014	0.026	0.033	0.011	0.005	0.011	0.007
#Mg	4.781	5.071	5.162	5.362	5.007	4.596	4.853	5.279	5.184	5.281	3.837	3.452	3.771	3.809	4.054	3.737
O site	**6.158**	**5.965**	**6.873**	**6.534**	**5.922**	**5.933**	**5.925**	**6.573**	**6.471**	**6.483**	**6.126**	**6.173**	**5.966**	**5.961**	**6.221**	**5.901**
#Ca	0.065	0.019	-	0.013	0.020	0.019	0.013	-	0.002	0.008	0.005	0.002	-	0.007	-	-
#Na	0.032	0.050	-	0.079	-	-	-	0.023	0.011	0.031	0.041	-	0.006	0.015	-	-
#K	1.177	1.870	0.678	1.143	1.894	1.887	1.966	1.014	1.250	1.195	1.515	1.982	1.980	1.981	1.170	1.593
A site	**1.275**	**1.939**	**0.678**	**1.235**	**1.914**	**1.906**	**1.979**	**1.037**	**1.263**	**1.234**	**1.562**	**1.984**	**1.986**	**2.002**	**1.170**	**1.593**
#O	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
#OH	3.977	3.963	3.979	3.967	3.954	3.950	3.956	4.000	3.939	3.943	3.930	4.000	3.782	3.798	4.000	4.000
#Cl	0.023	0.037	0.021	0.033	0.046	0.050	0.044	-	0.061	0.057	0.070	-	0.218	0.202	-	-
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.828	0.872	0.779	0.833	0.872	0.821	0.853	0.811	0.809	0.819	0.685	0.581	0.656	0.663	0.690	0.680
$Si/(Si+Al_{tet})$	0.727	0.734	0.664	0.690	0.743	0.727	0.729	0.714	0.712	0.717	0.702	0.658	0.735	0.733	0.735	0.748

TABLE D10: Complete compositional data for carbonates at Mount Dore. Structural formulae have been calculated on the basis of six oxygen atoms per formula unit, using the CARBONAT.EXE subroutine in MINFILE (Afifi and Essene, 1988). Samples with the prefix 59- are from the data set of Ophel (1980); localities and brief descriptions are given in Table D2.

TABLE D10: Carbonates

	27097 /2/1	27097 /2/2	27097 /2/3	27097 /2/4	27097 /2/5	27097 /2/6	27102 /4/1	27102 /4/2	27102 /4/3	27102 /4/4	27102 /4/5	27102 /4/6	27124 /5/1	27124 /5/2	27124 /5/3	27124 /5/4	27124 /5/5	27124 /5/6	27130 /2/1	27130 /2/2	27130 /2/3	27130 /2/4	27133 /4/1
CaO	33.23	30.39	33.08	33.49	33.14	32.53	33.9	32.49	33.7	32.62	32.6	33.24	60.63	59.64	60.18	59.14	58.43	60.05	58.37	58.12	62.82	61.1	58.87
MgO	26.04	22.4	24.91	23.99	25.05	23.66	26.01	25.86	26.68	24.39	24.93	24.66	-	-	0.09	0.08	0.13	-	-	-	-	0.06	-
FeO	0.87	0.76	0.83	1.06	0.98	1.01	0.15	1.31	0.37	0.31	0.3	0.31	-	0.13	0.32	-	-	-	-	0.1	0.13	-	0.09
MnO	0.8	0.56	0.75	0.81	0.73	0.74	0.55	0.95	0.63	0.53	0.54	0.47	0.45	0.81	0.5	0.08	0.69	0.49	0.78	0.49	0.92	0.61	-
CO_2	55.54	49.12	54.13	53.63	54.41	52.44	55.44	55.13	56.2	52.75	53.32	53.49	47.86	47.39	47.83	46.55	46.42	47.43	46.29	45.98	49.95	48.39	46.25
TOTAL	**116.48**	**103.23**	**113.7**	**112.98**	**114.31**	**110.38**	**116.05**	**115.74**	**117.58**	**110.6**	**111.69**	**112.17**	**108.94**	**107.97**	**108.92**	**105.85**	**105.67**	**107.97**	**105.44**	**104.69**	**113.82**	**110.16**	**105.21**
#Ca	0.939	0.971	0.959	0.980	0.956	0.974	0.960	0.925	0.941	0.971	0.960	0.975	1.988	1.975	1.975	1.994	1.975	1.987	1.979	1.984	1.974	1.982	1.998
#Mg	1.024	0.996	1.005	0.977	1.005	0.985	1.025	1.024	1.037	1.010	1.021	1.007	-	-	0.004	0.004	0.006	-	-	-	-	0.003	-
#Fe	0.019	0.019	0.019	0.024	0.022	0.024	0.003	0.029	0.008	0.007	0.007	0.007	-	0.003	0.008	-	-	-	-	0.003	0.003	-	0.002
#Mn	0.018	0.014	0.017	0.019	0.017	0.018	0.012	0.021	0.014	0.012	0.013	0.011	0.012	0.021	0.013	0.002	0.018	0.013	0.021	0.013	0.023	0.016	-
$\#CO_3$	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000

	27133 /4/2	27133 /4/3	27133 /4/4	27133 /4/5	27133 /4/6	27140 /2/1	27140 /2/2	27140 /2/3	27146 /1/1	27146 /1/2	27146 /1/3	27146 /1/4	27158 /2/1	27158 /2/2	27158 /2/3	27211 /2/1	27211 /2/2	27211 /2/3	27220 /1/1	27220 /1/2	27220 /1/3	27220 /1/4	27238 /2/1
CaO	58.84	58.96	59.27	59.89	61.75	59.64	60.33	60.84	29.08	29.18	29.03	29.54	29.11	29.39	29.39	27.27	27.22	27.79	29.06	28.75	29.09	29.42	54.57
MgO	-	-	0.2	0.07	-	0.12	-	0.09	22.11	22.6	22.22	22.52	22.35	21.81	22.59	22.1	22.08	22.07	22.37	22.21	22.4	22.28	0.09
FeO	0.1	-	-	-	-	-	0.12	0.14	0.25	0.17	0.16	0.23	-	0.77	0.24	0.26	0.42	0.37	0.5	0.43	0.61	0.54	0.13
MnO	-	-	-	0.13	1.14	0.4	0.38	0.44	0.7	0.66	0.59	0.66	0.77	0.96	0.65	0.37	0.52	0.48	0.36	0.35	0.34	0.37	0.4
CO_2	46.24	46.27	46.73	47.16	49.17	47.18	47.65	48.2	47.55	48.09	47.51	48.32	47.73	47.95	48.28	45.92	46.05	46.43	47.76	47.29	47.87	47.98	43.25
TOTAL	**105.18**	**105.23**	**106.2**	**107.25**	**112.06**	**107.34**	**108.48**	**109.71**	**99.69**	**100.7**	**99.51**	**101.27**	**99.96**	**100.88**	**101.15**	**95.92**	**96.29**	**97.14**	**100.05**	**99.03**	**100.31**	**100.59**	**98.44**
#Ca	1.997	2.000	1.991	1.993	1.971	1.984	1.987	1.981	0.960	0.952	0.959	0.959	0.957	0.962	0.955	0.932	0.928	0.939	0.955	0.954	0.954	0.962	1.980
#Mg	-	-	0.009	0.003	-	0.006	-	0.004	1.015	1.026	1.021	1.018	1.023	0.993	1.022	1.051	1.047	1.038	1.023	1.026	1.022	1.014	0.005
#Fe	0.003	-	-	-	-	-	0.003	0.004	0.006	0.004	0.004	0.006	-	0.020	0.006	0.007	0.011	0.010	0.013	0.011	0.016	0.014	0.004
#Mn	-	-	-	0.003	0.029	0.011	0.010	0.011	0.018	0.017	0.015	0.017	0.020	0.025	0.017	0.010	0.014	0.013	0.009	0.009	0.009	0.010	0.011
$\#CO_3$	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000

TABLE D10: Carbonates (continued)

	27238 /2/2	**27238 /2/3**	**27238 /2/4**	**27238 /4/1**	**27238 /4/2**	**27238 /4/3**	**27238 /4/4**	**27238 /4/5**	**27238 /4/6**	**27238 /4/7**	**27242 /1/1**	**27242 /1/2**
CaO	56.48	55.62	54.78	55.95	51.93	50.05	48.01	46.16	53.43	53.51	29.52	29.57
MgO	0.17	0.27	0.52	0.17	3.73	3.98	5.29	7.73	1.27	0.9	22.62	22.74
FeO	-	-	0.42	0.32	0.63	0.42	0.44	0.56	0.36	0.28	0.32	0.3
MnO	0.61	0.41	0.62	0.48	0.43	0.43	0.76	0.53	0.53	0.44	0.3	0.31
CO_2	44.89	44.2	44.2	44.59	45.48	44.15	44.19	45.34	43.87	43.42	48.25	48.41
TOTAL	**102.15**	**100.5**	**100.54**	**101.51**	**102.2**	**99.03**	**98.69**	**100.32**	**99.46**	**98.55**	**101.01**	**101.33**
#Ca	1.975	1.975	1.945	1.970	1.792	1.779	1.705	1.598	1.912	1.934	0.960	0.959
#Mg	0.008	0.013	0.016	0.008	0.179	0.197	0.261	0.372	0.063	0.045	1.024	1.026
#Fe	-	-	0.012	0.009	0.017	0.012	0.012	0.015	0.010	0.008	0.008	0.008
#Mn	0.017	0.012	0.017	0.013	0.012	0.012	0.021	0.015	0.015	0.013	0.008	0.008
$\#CO_3$	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000

	27242 /1/3	**27242 /1/4**	**27278 /1/1**	**27278 /1/2**	**27278 /1/3**	**27278 /1/4**	**27281 /1/1**	**27281 /1/2**	**27281 /1/3**	**27287 /1/1**	**27287 /1/2**
CaO	29.02	29.31	28.93	28.93	29.07	28.78	29.06	29.09	28.99	29.33	29.49
MgO	22.09	21.54	21.05	21.5	21	21.52	22.23	22.34	21.9	21.91	21.69
FeO	0.29	0.23	1.2	1.39	1.35	2.03	0.56	0.28	0.61	1.05	0.96
MnO	0.22	0.26	0.44	0.59	0.5	0.55	0.59	0.74	0.57	0.48	0.56
CO_2	47.21	46.82	46.7	47.4	46.88	47.67	47.79	47.85	47.39	47.88	47.76
TOTAL	**98.83**	**98.16**	**98.32**	**99.81**	**98.8**	**100.55**	**100.23**	**100.3**	**99.46**	**100.65**	**100.46**
#Ca	0.965	0.982	0.972	0.958	0.973	0.948	0.954	0.954	0.960	0.961	0.969
#Mg	1.022	1.005	0.984	0.991	0.978	0.986	1.016	1.020	1.009	0.999	0.992
#Fe	0.008	0.006	0.031	0.036	0.035	0.052	0.014	0.007	0.016	0.027	0.025
#Mn	0.006	0.007	0.012	0.015	0.013	0.014	0.015	0.019	0.015	0.012	0.015
$\#CO_3$	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000

	27287 /1/3	**27287 /1/4**	**59288 /104**	**59288 /105**	**59288 /106**
CaO	29.42	30.95	32.2	27.57	30.17
MgO	21.65	20.51	21.26	21.58	21.89
FeO	0.86	0.8	0.76	0.53	0.76
MnO	0.4	0.56	0.27	0.27	0.25
CO_2	47.5	47.52	49.12	45.69	48.12
TOTAL	**99.83**	**100.34**	**103.61**	**95.64**	**101.27**
#Ca	0.972	1.022	1.029	0.947	0.982
#Mg	0.995	0.943	0.945	1.031	0.992
#Fe	0.022	0.021	0.019	0.014	0.019
#Mn	0.010	0.015	0.007	0.007	0.006
$\#CO_3$	2.000	2.000	2.000	2.000	2.000

TABLE D11: Complete compositional data for chlorites at Mount Dore. Structural formulae have been calculated on the basis of 18(O+OH+Cl) per formula unit, using the CHLORITE.EXE subroutine in MINFILE (Afifi and Essene, 1988). Samples with the prefix 59- are from the data set of Ophel (1980); localities and brief descriptions are given in Table D2.

TABLE D11: Chlorites

	27077 /2/3	27077 /2/4	27102 /3/1	27102 /3/2	27102 /3/3	27124 /4/1	27124 /4/2	27124 /4/3	27124 /5/1
SiO_2	28.27	21.06	29.84	28.55	30.01	25.47	25.77	25.41	25.87
TiO_2	-	-	-	-	-	-	-	-	-
Al_2O_3	23.59	17.34	17.61	6.9	17.74	19	19.95	19.38	19.52
FeO	22.33	21.36	12.72	19.94	16.98	29.52	27.95	30.57	29.17
MnO	0.3	0.19	0.35	0.5	0.4	1.69	1.68	1.64	1.87
MgO	13.81	12.17	24.95	19.55	22.65	11.37	11.8	10.86	11.13
CaO	-	0.05	-	0.06	0.07	-	0.09	-	0.19
Na_2O	-	0.11	-	-	0.13	0.18	-	-	-
K_2O	0.5	-	0.05	0.05	-	0.11	-	0.11	-
H_2O	11.74	11.45	12.2	11.58	11.98	11.14	11.24	11.08	11.19
Cl	0.05	-	0.06	0.03	0.03	-	0.08	0.09	-
O=Cl	-0.01	-	-0.01	-0.01	-0.01	-	-0.02	-0.02	-
TOTAL	**100.58**	**83.73**	**97.77**	**87.15**	**99.98**	**98.48**	**98.54**	**99.12**	**98.94**
#Si IV	2.866	2.702	3.006	3.456	3.003	2.789	2.790	2.773	2.807
#Al IV	1.134	1.298	0.994	0.544	0.997	1.211	1.210	1.227	1.193
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	1.685	1.325	1.097	0.441	1.096	1.241	1.336	1.265	1.303
#Ti	-	-	-	-	-	-	-	-	-
#Fe +2	1.893	2.292	1.072	2.019	1.421	2.703	2.531	2.790	2.647
#Mn +2	0.026	0.021	0.030	0.051	0.034	0.157	0.154	0.152	0.172
#Mg	2.087	2.328	3.747	3.528	3.379	1.856	1.905	1.767	1.800
#Ca	-	0.007	-	0.008	0.008	-	0.010	-	0.022
#Na	-	0.027	-	-	0.025	0.038	-	-	-
#K	0.065	-	0.006	0.008	-	0.015	-	0.015	-
O site	**5.757**	**6.000**	**5.952**	**6.055**	**5.963**	**6.011**	**5.937**	**5.989**	**5.945**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	7.991	8.000	7.990	7.994	7.995	8.000	7.985	7.983	8.000
#Cl	0.009	0.000	0.010	0.006	0.005	-	0.015	0.017	-
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.524	0.504	0.778	0.636	0.704	0.407	0.429	0.388	0.405

	27124 /5/2	27130 /2/1	27130 /2/2	27130 /2/3	27130 /2/4	27130 /2/5	27130 /2/6	27130 /3/1	27130 /3/3
SiO_2	25.92	32.13	31.45	26.89	27.73	32.52	27.03	31.72	34.16
TiO_2	-	-	-	-	-	-	-	0.08	-
Al_2O_3	19.6	14.02	14.52	16.67	16.97	14.59	17.35	15.04	14.8
FeO	28.4	10.95	11.6	28.9	27.51	10.97	27.17	11.99	12.63
MnO	1.78	0.36	1.5	1.99	1.7	0.7	2.12	1.13	0.56
MgO	12.14	25.7	25.42	12.02	14.38	26.51	12.52	25.56	24.15
CaO	0.05	0.38	0.2	0.09	0.16	0.24	0.17	0.05	0.21
Na_2O	0.1	8.39	1.64	-	0.26	2.94	0.16	0.16	-
K_2O	-	0.04	-	-	-	0.06	-	-	0.23
H_2O	11.23	11.9	12.13	11.17	11.29	12.15	11.25	12.23	12.28
Cl	-	0.07	0.04	-	-	0.06	0.05	-	0.04
O=Cl	-	-0.002	-0.01	-	-	-0.01	-0.01	-	-0.01
TOTAL	**99.22**	**103.93**	**98.49**	**97.73**	**100**	**100.73**	**97.81**	**97.96**	**99.05**
#Si IV	2.791	3.094	3.162	2.961	2.946	3.178	2.951	3.185	3.370
#Al IV	1.209	0.906	0.838	1.039	1.054	0.822	1.049	0.815	0.630
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	1.279	0.685	0.883	1.125	1.071	0.858	1.183	0.964	1.091
#Ti	-	-	-	-	-	-	-	0.006	-
#Fe +2	2.558	0.882	0.975	2.662	2.444	0.896	2.480	1.007	1.042
#Mn +2	0.162	0.029	0.128	0.186	0.153	0.058	0.196	0.096	0.047
#Mg	1.949	3.689	3.810	1.973	2.278	3.862	2.037	3.826	3.552
#Ca	0.006	0.039	0.022	0.011	0.018	0.025	0.020	0.005	0.022
#Na	0.021	1.566	0.320	-	0.054	0.557	0.034	0.031	-
#K	-	0.005	-	-	-	0.007	-	-	0.029
O site	**5.975**	**6.896**	**6.137**	**5.957**	**6.018**	**6.264**	**5.950**	**5.935**	**5.784**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	8.000	7.989	7.993	8.000	8.000	7.990	7.991	8.000	7.993
#Cl	-	0.011	0.007	-	-	0.010	0.009	-	0.007
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.432	0.807	0.796	0.426	0.482	0.812	0.451	0.792	0.773

TABLE D11: Chlorites (continued)

	27130 /3/4	27140 /1/3	27146 /4/1	27146 /4/2	27146 /4/3	27158 /1/1	27158 /1/2	27158 /1/3	27181 /5/2	27181 /5/3	27181 /5/4	27202 /1/1	27202 /1/2	27202 /1/3	27202 /2/3	27202 /4/2	27202 /4/5	27227 /2/1
SiO_2	35.1	30.81	28.34	27.65	28.57	25.52	25.69	25.98	25.16	31.02	24.86	37.16	41.07	37.71	38.53	34.76	29.73	26.03
TiO_2	-	0.06	-	-	-	-	0.08	0.08	-	0.07	-	-	-	0.07	-	0.47	0.34	0.19
Al_2O_3	15.87	17.58	16.42	16.92	14.91	22.93	22.26	22.37	17.76	20.86	17.47	16.66	16.99	13.54	16.3	12.38	13.93	20.37
FeO	9.62	10.15	25.52	31.4	25.34	20.77	20.86	21.6	37.2	30.56	39.63	6.28	6.81	5.6	11.06	14.71	21.97	23.15
MnO	0.92	0.19	0.44	0.46	0.32	0.14	0.18	0.3	0.86	0.38	0.55	-	-	-	-	-	-	1.12
MgO	25.35	27.93	15.89	12.27	15.33	17.71	17.67	17.17	6.7	5.88	5.25	27.24	22.58	28.97	24.01	17.88	17.64	14.93
CaO	0.2	0.4	0.11	0.09	0.18	0.07	-	0.04	-	0.06	0.08	0.26	0.52	0.36	0.53	0.13	0.1	-
Na_2O	0.29	0.21	-	0.13	-	-	-	-	0.2	-	0.2	0.32	0.41	0.28	0.27	0.31	0.64	-
K_2O	0.51	0.05	-	-	0.05	-	-	-	-	2.25	0.09	0.16	0.52	0.1	0.15	6.47	0.28	-
H_2O	12.44	12.35	11.48	11.16	11.47	11.76	11.72	11.69	10.76	11.26	10.63	12.72	12.84	12.76	12.51	11.63	11.53	11.55
Cl	-	-	-	-	-	-	0.09	0.08	-	0.05	-	0.11	-	0.04	0.05	0.41	0.33	0.03
O=Cl	-	-	-	-	-	-	-0.02	-0.02	-	-0.01	-	-0.02	-	-0.01	-0.01	-0.09	-0.07	-0.01
TOTAL	**100.3**	**99.73**	**98.2**	**100.08**	**96.17**	**98.9**	**98.53**	**99.29**	**98.64**	**102.38**	**98.76**	**100.88**	**101.74**	**99.42**	**103.4**	**99.05**	**96.41**	**97.36**
#Si IV	3.373	3.001	3.023	2.969	3.124	2.636	2.668	2.683	2.847	3.213	2.844	3.461	3.762	3.566	3.552	3.588	3.197	2.783
#Al IV	0.627	0.999	0.977	1.031	0.876	1.364	1.332	1.317	1.153	0.787	1.156	0.539	0.238	0.434	0.448	0.412	0.803	1.217
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	1.170	1.019	1.088	1.110	1.045	1.427	1.393	1.405	1.215	1.759	1.200	1.289	1.597	1.075	1.324	1.094	0.963	1.351
#Ti	-	0.004	-	-	-	-	0.006	0.006	-	0.005	-	-	-	0.005	-	0.036	0.027	0.015
#Fe +2	0.773	0.827	2.277	2.820	2.317	1.794	1.812	1.865	3.520	2.647	3.792	0.489	0.522	0.443	0.853	1.270	1.976	2.070
#Mn +2	0.075	0.016	0.040	0.042	0.030	0.012	0.016	0.026	0.082	0.033	0.053	-	-	-	-	-	-	0.101
#Mg	3.631	4.055	2.527	1.964	2.499	2.727	2.736	2.643	1.130	0.908	0.895	3.782	3.084	4.084	3.300	2.751	2.828	2.380
#Ca	0.021	0.042	0.013	0.010	0.021	0.008	-	0.004	-	0.067	0.010	0.026	0.051	0.036	0.052	0.014	0.012	-
#Na	0.054	0.040	-	0.027	-	-	-	-	0.044	-	0.044	0.058	0.073	0.051	0.048	0.062	0.133	-
#K	0.063	0.006	-	-	0.007	-	-	-	-	0.297	0.013	0.019	0.061	0.012	0.018	0.852	0.038	-
O site	**5.787**	**6.009**	**5.944**	**5.974**	**5.919**	**5.968**	**5.963**	**5.950**	**5.991**	**5.657**	**6.007**	**5.663**	**5.387**	**5.706**	**5.595**	**6.080**	**5.978**	**5.918**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	8.000	8.000	8.000	8.000	8.000	8.000	7.984	7.986	8.000	7.991	8.000	7.983	8.000	7.994	7.992	7.928	7.940	7.995
#Cl	-	-	-	-	-	-	0.016	0.014	-	0.009	-	0.017	-	0.006	0.008	0.072	0.060	0.005
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.824	0.831	0.526	0.411	0.519	0.603	0.602	0.586	0.243	0.255	0.191	0.885	0.855	0.902	0.795	0.684	0.589	0.535

TABLE D11: Chlorites (continued)

	27227 /2/2	**27227 /2/3**	**27231 /4/1**	**27231 /4/2**	**27231 /4/3**	**27238 /1/1**	**27238 /1/2**	**27238 /1/3**	**27238 /3/4**	**27238 /3/5**	**27243 /2/1**	**27243 /2/2**	**27243 /2/3**	**27243 /4/1**	**27243 /4/2**	**27243 /4/3**	**27277 /1/1**	**27277 /1/2**
SiO_2	26.28	26.05	26.57	26.51	26.12	24.33	27.87	29.64	31.51	27.32	27.47	26.5	26.84	26.88	26.15	25.87	29.55	29.34
TiO_2	0.16	-	-	-	0.14	-	-	-	-	0.07	0.1	-	0.16	0.1	0.11	-	-	-
Al_2O_3	20.76	20.89	20.54	20.42	20.02	19.64	16.9	18.31	18.01	17.54	20.17	21.13	20.51	20.66	21.15	19.36	15.44	15.25
FeO	23.8	22.02	22.75	22.34	22.25	38.39	15.48	14.1	18.4	25.79	19.88	21.05	19.43	20.22	20.15	18.93	22.07	23.14
MnO	1.02	0.7	0.53	0.24	0.43	0.19	-	-	-	0.14	0.56	0.65	0.48	0.38	0.64	0.53	0.1	0.28
MgO	15	16.22	16.51	16.98	16.95	3.36	18.14	22.43	19.24	15.72	18.53	16.3	18.37	18.95	17.67	18.59	19.23	17.21
CaO	0.2	0.06	-	0.05	-	0.21	0.41	0.64	0.36	-	-	-	0.05	-	0.04	-	-	0.1
Na_2O	0.13	0.27	0.33	-	0.1	0.2	0.16	-	0.25	-	0.47	0.17	-	-	0.31	0.24	0.23	-
K_2O	-	-	-	-	-	-	-	0.06	1.09	0.06	-	-	-	0.05	-	0.04	0.28	0.04
H_2O	11.53	11.64	11.62	11.66	11.61	10.73	12.02	12.16	11.91	11.45	11.76	11.72	11.79	11.78	11.74	11.75	11.65	11.6
Cl	0.03	-	-	-	0.07	-	0.05	-	-	0.04	0.06	-	0.07	-	-	0.08	0.06	0.07
O=Cl	-0.01	-	-	-	-0.02	-	-0.01	-	-	-0.01	-0.01	-	-0.02	-	-	-0.02	-0.01	-0.02
TOTAL	**98.9**	**97.85**	**98.85**	**98.2**	**97.67**	**97.05**	**91.02**	**97.34**	**100.77**	**98.12**	**98.99**	**97.52**	**97.69**	**99.02**	**97.96**	**95.37**	**98.59**	**97.01**
#Si IV	2.767	2.752	2.779	2.783	2.767	2.813	3.092	3.016	3.145	2.922	2.829	2.790	2.798	2.768	2.733	2.781	3.087	3.135
#Al IV	1.233	1.248	1.221	1.217	1.233	1.187	0.908	0.984	0.855	1.078	1.171	1.210	1.202	1.232	1.267	1.219	0.913	0.865
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	1.343	1.352	1.311	1.309	1.266	1.490	1.301	1.211	1.264	1.132	1.278	1.412	1.319	1.276	1.339	1.234	0.988	1.056
#Ti	0.013	-	-	-	0.011	-	-	-	-	0.006	0.008	-	0.013	0.008	0.009	-	-	-
#Fe +2	2.096	1.945	1.990	1.961	1.971	3.712	1.436	1.200	1.536	2.306	1.712	1.853	1.694	1.741	1.761	1.702	1.928	2.068
#Mn +2	0.091	0.063	0.047	0.021	0.039	0.019	-	-	-	0.013	0.049	0.058	0.042	0.033	0.057	0.048	0.009	0.025
#Mg	2.354	2.554	2.574	2.657	2.676	0.579	3.000	3.402	2.863	2.506	2.845	2.558	2.855	2.909	2.753	2.980	2.995	2.742
#Ca	0.023	0.007	-	0.006	-	0.026	0.049	0.070	0.039	-	-	-	0.006	-	0.004	-	-	0.011
#Na	0.027	0.055	0.067	-	0.021	0.045	0.034	-	0.048	-	0.094	0.035	-	-	0.063	0.050	0.047	-
#K	-	-	-	-	-	-	-	0.008	0.139	0.008	-	-	-	0.007	-	0.005	0.037	0.005
O site	**5.946**	**5.976**	**5.989**	**5.954**	**5.983**	**5.871**	**5.821**	**5.890**	**5.889**	**5.971**	**5.986**	**5.916**	**5.929**	**5.974**	**5.987**	**6.020**	**6.004**	**5.907**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	7.995	8.000	8.000	8.000	7.987	8.000	7.991	8.000	8.000	7.993	7.990	8.000	7.988	8.000	8.000	7.985	7.989	7.987
#Cl	0.005	-	-	-	0.013	-	0.009	-	-	0.007	0.010	-	0.012	-	-	0.015	0.011	0.013
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.529	0.568	0.564	0.575	0.576	0.135	0.676	0.739	0.651	0.521	0.624	0.580	0.628	0.626	0.610	0.636	0.608	0.570

TABLE D11: Chlorites (continued)

	27277 /1/3	**27277 /1/4**	**27278 /1/1**	**27278 /1/2**	**27278 /1/3**	**27278 /1/4**	**27278 /1/5**	**27278 /2/1**	**27278 /2/2**	**27278 /2/3**	**27278 /2/4**	**27281 /1/1**	**27281 /1/2**	**27281 /1/3**	**27281 /2/4**	**27281 /2/5**	**27281 /2/6**	**27283 /1/1**
SiO_2	23.84	27.69	34.15	32.16	30.83	30.65	30.07	31.24	34	26.07	31.66	28.76	27.34	27.45	28.39	28.13	28.82	29.43
TiO_2	-	-	0.42	0.4	0.17	-	-	0.23	0.49	0.24	0.11	-	0.09	-	-	-	-	-
Al_2O_3	12.32	16.13	14.17	14.41	14.89	15.02	14.71	15.22	14.34	12.08	14.87	20.49	22.1	22.41	21.06	21.76	20.11	19.49
FeO	20.11	30.96	15.09	15.94	19.02	21.94	21.76	18.74	15.77	14.36	14.91	9.58	11.57	10.62	10.61	11.41	10.15	8.06
MnO	0.38	0.36	0.1	0.32	0.27	0.25	0.53	0.15	-	-	0.15	0.19	0.12	0.24	0.08	0.3	0.12	0.22
MgO	14.65	11.98	21.71	23.34	20.81	19.56	18.5	21.43	20.81	17.31	21.82	26.08	24.62	24.67	26	24.5	26.45	28.35
CaO	0.08	0.16	0.11	0.09	0.17	0.19	0.1	0.06	-	0.21	0.06	0.09	0.14	-	-	-	0.17	-
Na_2O	-	0.12	-	0.12	-	-	-	0.17	-	-	-	0.11	-	-	0.1	0.18	0.12	-
K_2O	0.41	-	3.3	0.96	0.74	-	0.06	0.84	3.68	1.99	2.1	-	-	0.04	-	0.04	-	0.04
H_2O	11.46	11.17	11.89	11.95	11.8	11.7	11.69	11.82	11.73	11.74	11.89	12.4	12.28	12.34	12.35	12.27	12.36	12.48
Cl	0.07	-	0.22	0.14	0.07	0.06	-	0.1	0.54	0.21	0.28	-	-	-	-	0.07	-	-
O=Cl	-0.02	-	-0.05	-0.03	-0.02	-0.01	-	-0.02	-0.12	-0.05	-0.06	-	-	-	-	-0.02	-	-
TOTAL	**83.3**	**98.57**	**101.11**	**99.8**	**98.76**	**99.36**	**97.42**	**99.98**	**101.24**	**84.16**	**97.79**	**97.7**	**98.26**	**97.77**	**98.59**	**98.64**	**98.3**	**98.07**
#Si IV	3.068	3.023	3.384	3.225	3.172	3.160	3.177	3.164	3.384	3.225	3.252	2.856	2.724	2.737	2.803	2.788	2.851	2.891
#Al IV	0.932	0.977	0.616	0.775	0.828	0.840	0.823	0.836	0.616	0.775	0.748	1.144	1.276	1.263	1.197	1.212	1.149	1.109
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	0.937	1.098	1.039	0.928	0.978	0.986	1.008	0.980	1.067	0.987	1.052	1.253	1.319	1.371	1.253	1.330	1.196	1.147
#Ti	-	-	0.031	0.030	0.013	-	-	0.018	0.037	0.022	0.008	-	0.007	-	-	-	-	-
#Fe +2	2.164	2.827	1.251	1.337	1.637	1.892	1.923	1.587	1.313	1.486	1.281	0.795	0.964	0.886	0.876	0.946	0.840	0.662
#Mn +2	0.041	0.033	0.008	0.027	0.024	0.022	0.047	0.013	-	-	0.013	0.016	0.010	0.020	0.007	0.025	0.010	0.018
#Mg	2.811	1.950	3.207	3.489	3.192	3.007	2.914	3.235	3.088	3.192	3.341	3.860	3.657	3.667	3.827	3.620	3.901	4.151
#Ca	0.011	0.019	0.012	0.010	0.019	0.021	0.011	0.065	-	0.028	0.007	0.010	0.015	-	-	-	0.018	-
#Na	-	0.025	-	0.023	-	-	-	0.033	-	-	-	0.021	-	-	0.019	0.035	0.023	-
#K	0.067	-	0.417	0.123	0.097	-	0.008	0.109	0.467	0.314	0.275	-	-	0.005	-	0.005	-	0.005
O site	**6.031**	**5.952**	**5.966**	**5.967**	**5.960**	**5.927**	**5.911**	**5.981**	**5.971**	**6.029**	**5.977**	**5.956**	**5.972**	**5.949**	**5.982**	**5.961**	**5.988**	**5.984**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	7.985	8.000	7.963	7.976	7.988	7.990	8.000	7.983	7.909	7.956	7.951	8.000	8.000	8.000	8.000	7.988	8.000	8.000
#Cl	0.015	-	0.037	0.024	0.012	0.010	-	0.017	0.091	0.044	0.049	-	-	-	-	0.012	-	-
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.565	0.408	0.719	0.723	0.661	0.614	0.602	0.671	0.702	0.682	0.723	0.829	0.791	0.805	0.814	0.793	0.823	0.862

TABLE D11: Chlorites (continued)

	27283 /1/2	27283 /1/3	27283 /1/4	27283 /3/1	27283 /3/2	27284 /2/1	27284 /3/3	27284 /3/4	27284 /5/1	27284 /5/2	27284 /5/3	27287 /2/1	27287 /2/2	27287 /2/3	27287 /2/4	27287 /2/5	27287 /2/6
SiO_2	29.56	25.68	32.72	31.77	31.39	29.95	27.41	28.59	27.47	27.05	28.4	31.32	33.96	30.83	33.85	30.36	30.51
TiO_2	-	0.1	0.27	-	-	-	-	0.07	-	-	0.1	-	-	-	-	-	-
Al_2O_3	19.73	18.86	14.85	18.32	18.21	17.53	20.81	20.09	16.26	16.4	16.47	13.63	13.61	13.56	13.96	13.3	13.95
FeO	8.03	9.05	14.59	18.24	18.17	17.05	14.44	12.24	31.55	31.99	31.03	19.4	10.96	20	11.36	20.59	21.36
MnO	0.13	0.08	-	-	0.08	0.08	0.11	0.22	0.24	0.36	0.38	0.2	0.23	0.31	-	0.27	0.23
MgO	28.97	23.77	23.81	20.98	20.91	20.65	23.43	24.71	10.71	10.85	11.95	21.48	27.11	21.03	26.69	19.75	19.54
CaO	-	-	0.09	0.19	0.2	0.14	-	0.05	0.13	0.14	-	0.12	0.26	0.05	0.43	0.6	0.63
Na_2O	0.25	0.23	-	0.12	0.12	-	0.17	0.14	0.21	0.15	0.39	-	-	0.25	-	0.09	-
K_2O	-	-	1.23	-	0.1	0.44	-	-	0.07	-	0.04	-	-	0.07	-	-	-
H_2O	12.48	12.36	12.08	12.01	11.99	11.97	12.11	12.24	11.13	11.07	11.19	11.86	12.38	11.79	12.34	11.72	11.71
Cl	-	0.03	0.05	-	-	0.04	-	-	-	0.08	-	-	-	-	0.06	0.05	-
O=Cl	-	-0.01	-0.01	-	-	-0.01	-	-	-	-0.02	-	-	-	-	-0.01	-0.01	-
TOTAL	**99.15**	**90.15**	**99.68**	**101.63**	**101.17**	**97.84**	**98.48**	**98.35**	**97.77**	**98.07**	**99.95**	**98.01**	**98.51**	**97.89**	**98.68**	**96.72**	**97.93**
#Si IV	2.869	2.806	3.256	3.115	3.099	3.073	2.763	2.854	3.037	2.991	3.045	3.241	3.347	3.214	3.334	3.224	3.198
#Al IV	1.131	1.194	0.744	0.885	0.901	0.927	1.237	1.146	0.963	1.009	0.955	0.759	0.653	0.786	0.666	0.776	0.802
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	1.126	1.234	0.998	1.232	1.218	1.193	1.236	1.217	1.156	1.128	1.127	0.904	0.928	0.879	0.955	0.888	0.922
#Ti	-	0.008	0.020	-	-	-	-	0.005	-	-	0.008	-	-	-	-	-	-
#Fe +2	0.652	0.827	1.214	1.496	1.500	1.463	1.217	1.022	2.917	2.958	2.783	1.679	0.903	1.743	0.936	1.828	1.873
#Mn +2	0.011	0.007	-	-	0.007	0.007	0.009	0.019	0.022	0.034	0.035	0.018	0.019	0.027	-	0.024	0.020
#Mg	4.191	3.871	3.532	3.067	3.078	3.159	3.521	3.677	1.765	1.788	1.910	3.314	3.984	3.268	3.919	3.126	3.054
#Ca	-	-	0.010	0.020	0.021	0.015	-	0.005	0.015	0.017	-	0.013	0.027	0.006	0.045	0.068	0.071
#Na	0.047	0.049	-	0.023	0.023	-	0.033	0.027	0.045	0.032	0.081	-	-	0.051	-	0.019	-
#K	-	-	0.156	-	0.013	0.058	-	-	0.010	-	0.005	-	-	0.009	-	-	-
O site	**6.026**	**5.996**	**5.931**	**5.838**	**5.859**	**5.895**	**6.017**	**5.973**	**5.931**	**5.957**	**5.949**	**5.927**	**5.862**	**5.983**	**5.855**	**5.953**	**5.940**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	8.000	7.994	7.992	8.000	8.000	7.993	8.000	8.000	8.000	7.985	8.000	8.000	8.000	8.000	7.990	7.991	8.000
#Cl	-	0.006	0.008	-	-	0.007	-	-	-	0.015	-	-	-	-	0.010	0.009	-
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.865	0.824	0.744	0.672	0.672	0.683	0.743	0.783	0.377	0.377	0.407	0.664	0.815	0.652	0.807	0.631	0.620

TABLE D11: Chlorites (continued)

	59278 /48	**59278 /49**	**59278 /50**	**59278 /51**	**59278 /52**	**59278 /53**	**59278 /54**	**59278 /55**	**59278 /56**	**59284 /35**	**59284 /36**	**59284 /37**	**59284 /38**	**59284 /39**	**59287 /86**	**59287 /87**	**59287 /88**	**59288 /40**
SiO_2	25.72	24.56	25.42	23.66	27.01	26.69	29.59	21.99	25.83	30.31	31.83	33.03	32.39	30.89	28.97	29.1	28.15	33.03
TiO_2	-	-	0.08	0.08	0.07	0.08	0.07	0.12	0.11	-	0.05	0.04	0.04	0.03	-	0.05	-	0.62
Al_2O_3	26.67	25.26	25.78	23.72	26.87	25.92	25.98	22.37	25.91	14.4	17.76	18.78	17.99	17.27	17.66	19.87	19.91	15.24
FeO	34.96	43.1	42.66	41.77	36.49	37.29	28.97	38.75	43.06	16.69	19.57	19.06	18.06	19.74	18.27	14.25	15.57	13.18
MnO	0.09	0.06	0.15	0.12	0.17	0.2	0.15	0.16	0.14	0.45	0.59	0.61	0.47	0.54	0.21	0.21	0.35	0.14
MgO	8.38	1.27	2.83	2.44	7.52	7.11	14.69	2.45	2.1	21.36	22.74	23.76	23.76	21.82	22.94	24.75	23.23	24.83
CaO	-	-	0.13	0.23	0.11	0.11	0.14	0.14	0.13	0.13	0.04	0.11	0.07	0.03	0.07	0.06	0.08	0.09
Na_2O	0.01	0.04	0.02	0.04	0.04	0.09	0.07	0.04	0.1	0.04	-	-	-	-	-	-	-	0.2
K_2O	-	-	0.05	0.05	0.06	0.07	0.08	0.04	0.05	0.04	-	0.06	0.02	0.01	0.06	0.01	0.02	1.38
H_2O	11.15	10.69	10.75	10.67	11.12	11.05	11.53	10.68	10.76	11.96	11.9	11.96	11.995	11.86	11.89	12.14	12.04	12.09
Cl	-	-	0.04	-	-	-	-	-	-	0.03	-	-	-	-	-	-	-	0.2
O=Cl	-	-	-0.01	-	-	-	-	-	-	-0.01	-	-	-	-	-	-	-	-0.05
TOTAL	**106.98**	**104.98**	**107.9**	**102.78**	**109.46**	**108.61**	**111.27**	**96.74**	**108.19**	**95.41**	**104.48**	**107.41**	**104.8**	**102.19**	**100.07**	**100.44**	**99.35**	**100.95**
#Si IV	2.565	2.609	2.602	2.581	2.632	2.640	2.730	2.563	2.637	3.203	3.053	3.055	3.071	3.048	2.919	2.860	2.824	3.228
#Al IV	1.435	1.391	1.398	1.419	1.368	1.360	1.270	1.437	1.363	0.797	0.947	0.945	0.929	0.952	1.081	1.140	1.176	0.772
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	1.699	1.771	1.713	1.630	1.717	1.662	1.555	1.636	1.753	0.997	1.061	1.103	1.081	1.056	1.017	1.161	1.178	0.983
#Ti	-	-	0.006	0.007	0.005	0.006	0.005	0.011	0.008	-	0.004	0.003	0.003	0.002	-	0.004	-	0.046
#Fe +2	2.915	3.829	3.652	3.810	2.973	3.085	2.235	3.777	3.676	1.475	1.570	1.474	1.432	1.629	1.540	1.171	1.306	1.077
#Mn +2	0.008	0.005	0.013	0.011	0.014	0.017	0.012	0.016	0.012	0.040	0.048	0.048	0.038	0.045	0.018	0.017	0.030	0.012
#Mg	1.246	0.201	0.432	0.397	1.092	1.048	2.021	0.426	0.320	3.365	3.252	3.276	3.358	3.210	3.446	3.626	3.474	3.617
#Ca	-	-	0.014	0.027	0.011	0.012	0.014	0.017	0.014	0.015	0.004	0.011	0.007	0.003	0.008	0.006	0.009	0.009
#Na	0.002	0.008	0.004	0.008	0.008	0.017	0.013	0.009	0.020	0.008	-	-	-	-	-	-	-	0.038
#K	-	-	0.007	0.007	0.007	0.009	0.009	0.006	0.007	0.005	-	0.007	0.002	0.001	0.008	0.001	0.003	0.172
O site	**5.869**	**5.814**	**5.841**	**5.896**	**5.828**	**5.856**	**5.863**	**5.897**	**5.810**	**5.906**	**5.939**	**5.922**	**5.922**	**5.946**	**6.036**	**5.987**	**6.000**	**5.954**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	8.000	8.000	7.993	8.000	8.000	8.000	8.000	8.000	8.000	7.995	8.000	8.000	8.000	8.000	8.000	8.000	8.000	7.967
#Cl	-	-	0.007	-	-	-	-	-	-	0.005	-	-	-	-	-	-	-	0.033
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.299	0.050	0.106	0.094	0.269	0.254	0.475	0.101	0.080	0.695	0.674	0.690	0.701	0.663	0.691	0.756	0.727	0.771

TABLE D11: Chlorites (continued)

	59288 /41	59299 /81	59299 /82	59299 /83	59306 /84	59308 /67	59308 /68	59313 /22	59313 /23	59313 /24	59314 /103	59315 /69	59315 /70	59315 /71	59315 /72	59315 /73	59315 /74
SiO_2	33.22	31.12	32.96	39.15	29.13	29.27	37.08	26.8	25.38	26.19	25.33	27.65	31.5	29.51	29.32	28.68	29.39
TiO_2	0.88	0.01	-	0.02	0.11	0.02	0.01	0.13	0.04	0.01	-	0.04	0.04	0.04	0.03	0.04	0.05
Al_2O_3	14.62	17.04	16.7	15.42	18.06	10.41	10.19	23.33	21.75	23.47	19.53	14.85	15.75	15.69	15.71	15.64	14.61
FeO	12.29	19.32	17.9	14.98	18.99	12.37	12.36	34.05	33.84	28.39	26.39	26.11	27.35	25.73	28.56	29.22	28.66
MnO	0.2	0.46	0.41	0.2	0.8	0.92	0.59	1.75	1.51	2.08	0.17	0.48	0.57	0.63	0.57	0.54	0.59
MgO	24.49	21.38	22.94	24.61	19.86	24.77	23.6	10.83	9.7	13.08	14.63	15.08	14.83	16.85	16.46	14.86	15.44
CaO	0.14	0.11	0.02	0.18	0.01	1.43	0.85	0.09	0.02	0.04	0.22	0.37	0.06	0.13	0.06	0.07	0.07
Na_2O	0.08	-	-	-	0.04	0.67	0.29	0.03	-	0.03	0.02	0.07	-	-	-	-	-
K_2O	1.94	-	0.02	1.16	0.53	0.08	0.08	-	-	-	-	0.06	0.81	0.07	0.04	0.06	0.04
H_2O	12.08	11.89	12.02	12.24	11.82	11.99	12.32	11.09	11.02	11.32	11.39	11.37	11.43	11.48	11.34	11.28	11.31
Cl	0.23	-	-	-	-	0.03	-	-	-	-	-	-	-	-	-	-	-
O=Cl	-0.05	-	-	-	-	-0.01	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**100.12**	**101.33**	**102.97**	**107.96**	**99.35**	**91.95**	**97.37**	**108.1**	**103.26**	**104.61**	**97.68**	**96.08**	**102.34**	**100.13**	**102.09**	**100.39**	**100.16**
#Si IV	3.275	3.092	3.183	3.516	2.979	3.220	3.723	2.656	2.665	2.639	2.739	3.052	3.220	3.079	3.030	3.037	3.111
#Al IV	0.725	0.908	0.817	0.484	1.021	0.780	0.277	1.344	1.335	1.361	1.261	0.948	0.780	0.921	0.970	0.963	0.889
T site	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**
#Al VI	0.973	1.087	1.083	1.147	1.155	0.570	0.928	1.381	1.357	1.425	1.228	0.984	1.118	1.009	0.944	0.988	0.933
#Ti	0.065	0.001	-	0.001	0.008	0.002	0.001	0.010	0.003	0.001	-	0.003	0.003	0.003	0.002	0.003	0.004
#Fe +2	1.013	1.605	1.445	1.125	1.624	1.138	1.038	2.822	2.972	2.392	2.387	2.410	2.338	2.245	2.469	2.587	2.537
#Mn +2	0.017	0.039	0.034	0.015	0.069	0.086	0.050	0.147	0.134	0.177	0.016	0.045	0.049	0.056	0.050	0.048	0.053
#Mg	3.599	3.167	3.302	3.294	3.028	4.062	3.532	1.600	1.518	1.964	2.358	2.481	2.260	2.621	2.536	2.345	2.436
#Ca	0.015	0.012	0.002	0.017	0.001	0.169	0.091	0.010	0.002	0.004	0.025	0.044	0.007	0.015	0.007	0.008	0.008
#Na	0.015	-	-	-	0.008	0.143	0.056	0.006	-	0.006	0.004	0.015	-	-	-	-	-
#K	0.244	-	0.002	0.133	0.069	0.011	0.010	-	-	-	-	0.008	0.106	0.009	0.005	0.008	0.005
O site	**5.941**	**5.910**	**5.868**	**5.734**	**5.963**	**6.180**	**5.707**	**5.975**	**5.986**	**5.970**	**6.018**	**5.991**	**5.881**	**5.958**	**6.013**	**5.989**	**5.977**
#O	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
#OH	7.962	8.000	8.000	8.000	8.000	7.994	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000
#Cl	0.038	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-	-
Charge	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Mg/(Mg+Fe)	0.780	0.664	0.696	0.745	0.651	0.781	0.773	0.362	0.338	0.451	0.497	0.507	0.492	0.539	0.507	0.475	0.490