DEPARTMENT OF THE INTERIOR

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Data tables for microprobe analyses of garnets from skarns at Copper Basin in the Battle Mountain Mining District, Lander County, Nevada

by

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

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Introduction

Microprobe data for garnets from seven discrete bodies of skarn and/or skarnoid in the Copper Basin area at Battle Mountain, Lander County, Nevada were acquired as part of a study of the mineral chemistry of skarns from north-central Nevada. The study area lies along the eastern edge of the Antler Peak quadrangle, northeast of the areas of extensive mining at Copper Canyon and east of the Buckingham porphyry molybdenum system (Theodore and McKee, 1983). Roberts (1964) mapped the Antler Peak quadrangle and discussed the stratigraphy and structure; Roberts and Arnold (1965) summarized the geology of the ore deposits. Theodore (1982) mapped the Buckingham Camp - Copper Basin area at a scale of 1:4800 and delineated the skarn bodies studied in this report. Skarns occur in metasedimentary rocks of the Upper Cambrian Harmony, Middle Pennsylvanian Battle, and Upper Pennsylvanian and Lower Permian Antler Peak Formations. This report is a tabulation of garnet data for 42 samples from seven separately mapped skarn bodies, mostly in the Harmony and Battle Formations. Analyses are grouped by skarn and by sample. Sample localities and individual skarns, arbitrarily labeled A (westernmost) through G (easternmost), are shown on a geologic sketch map in figure 1.

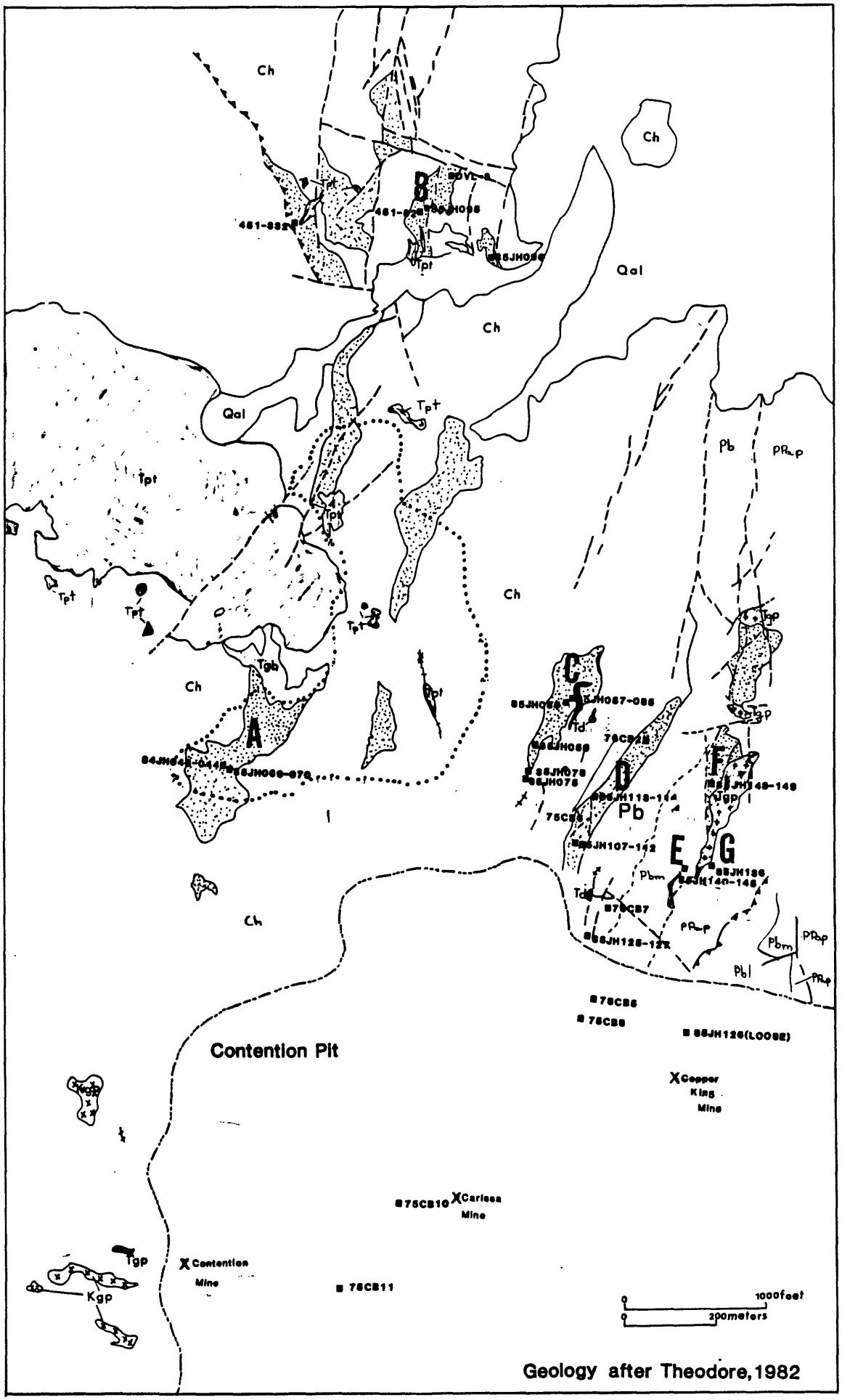
Acknowledgements

The author would like to thank Lisa Perry of the Santa Fe Mining Company for providing 3 samples from the skarn B area. Pat Wotruba, Rob Benson and Kirk Schmidt of the Battle Mountain Gold Company provided access to the area and guided sampling. They also provided drill core samples from the Surprise area (east of skarn E) and from the Fortitude deposit. Ted Theodore directed sample collection and provided the 76CB traverse.

Description of samples

The samples all represent surface samples typical of the skarn in the outcrop area. Skarn A is a bedded skarnoid in hornfels of the Harmony Formation. The rocks in the area exhibit various degrees of calcsilicate encroachment, largely as veins, on hornfels. Potassium feldspar and pyroxene precede garnet paragenetically. Quartz veins are ubiquitous within the mapped area of stockworks (fig. 1). Some rocks, such as 84JH044, are composed entirely of veins of quartz and reddish garnet. The garnets are isotropic and appear reddish to pink in thin section. Skarn B consists of a group of mostly fault-segmented skarn bodies within the Harmony Formation. The rocks are red or green spongy garnetites, with pyroxene and epidote. The garnets are mainly colorless to pale yellow and anisotropic, but some crystals have isotropic yellow cores which are generally andradite-rich (e.g., OVL-3, GA5-1). The B group of skarns has been termed the Overlook Property by Santa Fe Mining Company. Skarn C also lies entirely within the Harmony Formation and consists of finely laminated and veined red and green calcsilicate rock and hornfels which is cut by a diorite dike in

Figure 1. Geologic sketch map showing skarns (stippled pattern) at Copper Basin, Lander County, Nevada. Geology is taken from the northeastern part of a geologic map of the Buckingham Camp - Copper Basin area by Theodore (1982). Sample localities for garnet analyses included in this study are plotted and skarn bodies (A through G) are labeled. Major faults are shown as dashed lines; dotted line marks limit of abundant quartz stockworks. Dashed line marks 1982 outer limit of Duval Copper Basin copper ore mining of the Contention Pit. Map units are as follows: Ch, Harmony Formation; Pbl, lower member of Battle Formation; Pbm, middle member of Battle Formation; PPap, Antler Peak limestone; Kgp, porpyhritic granite of Buckingham Camp complex; Tgb, granitic rocks of the Bluff area; Tgp, granodiorite porphyry; Tpt, porphyritic tonalite; Td, diorite; Qal, includes alluvium, slopewash and fanglomerate deposits.


Ch
Ch
Ch
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Ch
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Qal
Qal
Tpt
Tpt
Tpt
Tpt
Tpt
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Tgb
Tgp
Tgp
Tgp
Kgp
Pb
Pb
Pbm
Pbm
Pbl
PR-p
PR-p
PR-p
PR-p
Td
A
B
C
D
E
F
G
Contention Pit
X Contention Mine
X Carissa Mine
X Copper King Mine
B 75CB10
B 75CB11
B 75CB8
B 75CB9
B 86JH126(LOOSE)
0 1000feet
0 200meters
Geology after Theodore, 1982

which some endoskarn has formed. As many as nine or more discrete subparallel layers of varying texture and modal mineralogy occur across the 2-cm width of some thin sections, such as 85JH078, from this body of skarn. Abundant clay-size material obscures precise determinations of garnet optical properties. In some rocks, all garnets are colorless and anisotropic whereas others have reddish, isotropic garnets or garnets with isotropic cores and fine-scale alternating isotropic to anisotropic rims. Garnets tend to occur in patches with partly developed euhedral rims or as poorly defined veins. Skarn D occurs along the unconformity between the Harmony and Battle Formations. Samples from skarn D include rocks along a traverse from north (sample 76CB2) to south (sample 7CB11) into the Contention Pit of the Copper Basin Mine. The samples exhibit increasing degrees of retrograde alteration along the traverse towards the south; the southernmost samples contain sulfide minerals in veins and filling interstitial areas among garnet crystals. The rocks are predominantly garnetites, with two generations of garnet. Distinctions between the two generations are clearest in sample 76CB2 in which a mat of fine-grained (averaging 0.4 mm in diameter), paragenetically early, amber-colored garnets is cut by veins of very coarse (as much as 4mm across), darker-colored red-brown garnets. In thin section, the early garnets appear colorless and anisotropic whereas the late garnets have distinctive yellow isotropic cores surrounded by rims that are colorless and anisotropic or that exhibit fine-scale bands of alternating color and isotropism. Samples 76CB3, 76CB4, and 85JH107 contain chromite rather than the altered, possibly hydrated, iron oxide-iron silicate mixture that typically occurs as the opaque mineral in the other samples. Some of the garnets near chromite are distinctly green and have high, but variable Cr contents. Skarn E includes massive spongy garnetite in contact with silicified fossiliferous limestone in the Battle Formation. Garnets in skarn E samples are all anisotropic. Skarn F is in the middle unit of the Battle Formation; the two samples studied are garnetites with extensive retrograde alteration. Most garnets are colorless, euhedral, and anisotropic with sector zones and prominent growth zones, but some have isotropic cores. Skarn G lies east of a large body of granodiorite porphyry in an outcrop of Antler Peak limestone cut by a diorite (Td) dike; garnets occur as colorless, anisotropic pods in a clastic calcite-rich rock.

In addition, data are included for two samples from drill cores from mineralized areas for comparison. Sample BMG 2400A 214-215 is from the area of the Surprise Mine, east of skarn G (Mining Activity Digest, 1986). Sample BMG 1998 314' is from the Antler Peak Formation at the Fortitude deposit at Copper Canyon (Wotruba and others,1986).

Analytical technique

All data were acquired with an ARL-SEMQ 9-channel microprobe at U.S. Geological Survey laboratories in Reston, VA. The microprobe was operated at 15 kv with a beam current of 0.10 microamps. Natural and synthetic minerals were used as primary

standards; working standards used to check accuracy include natural andradite, pyrope, and almandine garnets. The analytical packages used to acquire the data are summarized in Appendix A, along with a listing of detection limits and an estimate of precision for each element. Data were reduced on-line using the program $ANBA (McGee, 1983) which uses a Bence-Albee (1968) correction scheme with alpha factors tabulated by Albee and Ray (1970). Counting times for each element were 20 seconds or more; backgrounds were fit using an automatic interpolation method based on average atomic number (McGee, 1985). Due to the fine-scale zoning present in many of the garnets, many single spot analyses are presented. Some analyses represent averages of several closely spaced spots from one part of a garnet grain.

Explanation of tables

Data tables are grouped by skarn, A to G. Each page of analyses represents garnet analyses for a single sample. The sample number is given in the upper left corner of the page.

Column headers

Each garnet crystal (or vein) is reported as a separate grain, GA1,GA2,etc.. Multiple analysis points within the same grain are designated -1, -2, etc.. "Point" is a code to describe the nature of the point analysed. The code explanations are as follows:

(n)	analysis represents an average of n closely spaced points
n	distance, in microns, along a traverse within a single grain from some reference point designated as 0
/X	point analysed is at the rim of the grain against mineral X; X may be numbered if it was analysed
[X]	garnet is completely enclosed by mineral X
c	core; oc outer core
r	rim; ir inner rim
m	midway between core and rim
v	vein, as opposed to discrete garnet crystal
band	optically distinct narrow band or growth zone within a crystal or a vein; usually yellow and occurs in outer third of the grain

mineral codes:

AM	- amphibole	I	- interstitial clay or other
CC	- calcite	KF	- potassium feldspar
CH	- chlorite	OP	- opaque mineral
CR	- chromite	PG	- plagioclase
EP	- epidote	PX	- clinopyroxene
FS	- feldspar	PY	- pyrite
GA	- garnet	Q	- quartz

"Optics" refers to the isotropism (I) or anisotropism (A) of the point analysed and to the color as observed in thin section in plane polarized transmitted light. A slash (/) separates the isotropism code from the color code, which is given as a lower case letter: y (yellow), yb (brownish yellow), c (colorless), r (red, but actually describes a range of colors from reddish to

pinkish brown to amber), o (orange), g (green). The color determinations are quite subjective; the "r" code is especially variable but is distinct from the clear yellow color coded as "y". Although the "r" color may have a yellowish tint, it always looks brownish or pink in a field of view containing typical yellow-green epidote. The color varies depending on the intensity of the light and on the thickness of the section. Nevertheless, changes in color usually correspond directly with changes in composition. Most yellow cores and zones are iron-rich relative to colorless or reddish rims or zones. In some cases, an area that appears to be yellow and isotropic is less iron-rich than the surrounding colorless areas. This may reflect small-scale zoning within the grain where the beam strikes an area too small to be resolved optically. Garnets do not fluoresce under the electron beam, so there is always the chance that the point analysed is off of the desired spot. However, the electron beam commonly produces a contamination spot on the surface of the grain which can be checked later with a microscope to ascertain the exact location. In cases where colors or zones could not be resolved, the code is left blank or the zoning is indicated in the tables.

Oxide list

The microprobe analysis for each point (or average of several closely spaced points) is listed below the column heading. Total iron is reported as FeO. An entry of "0.00" means that the element was analysed for but not detected whereas an entry of "n.d." means that an element was not determined. The analytical package always includes the major garnet constituents Si, Al, Fe, Mg, Ca, Ti, Mn as well as Na. Cr was included in many analyses and K, F, Cl, Zn and S were included for some analyses. The major garnet constituents are summed below the oxide list and any additional constituents are tabulated below the sum but are not included in it.

Ferric iron estimate and formula calculation

The chemistry of garnets from the skarns indicates that they are largely solid solutions between andradite, $Ca_3Fe_2^{+3}Si_3O_{12}$, and grossular, $Ca_3Al_2Si_3O_{12}$ and many analyses approach pure end-member andradite compositions. Ferric iron contents were estimated by assuming ideal garnet stoichiometry with 8 cations and 12 oxygen anions. This assumption may not be valid if a hydrogarnet component is present. F, Cl, K_2O and SO_3 contents are usually near or below detection limits. These elements were not included in the formula calculations. Significant quantities of halogens are occasionally encountered in the tables, e.g., sample 85JH079, GA3-1. However, compositions for closely spaced points are not always reproducible (see repeat analysis, point GA3-1') due to the heterogeneity of the garnets. High values for halogens are not consistent throughout single grains or for particular garnet compositions. These high values may represent the beam striking a salt-bearing fluid inclusion in the garnet crystal or a minute grain of some halogen-bearing alteration product. The method of calculation follows that described by Robinson (1980, p.421-422) for recalculating microprobe analyses for pyroxenes and a worked example is given in Appendix B. If

enough iron is available for partitioning between Fe^{+3} and Fe^{+2}, then the amounts of FeO and Fe_2O_3 are computed and listed in the table followed by (c). If the total iron available is insufficient to make the calculation, total iron is converted to Fe_2O_3. The oxide sum for the analysis is then adjusted to reflect the calculated iron values. Cation values listed in the tables are normalized to 8 and the cations are partitioned into sites according to the ideal garnet formula $X_3Y_2Z_3O_{12}$, where X = Ca,Mg,Mn,Na,Fe^{+2}, Y = Al,Fe^{+3},Ti,Cr, and Z = Si,Al. Deviations from ideal stoichiometry reflect analytical error, which is probably most severe for Si, as well as errors in ferric iron estimates and failure to include water. Most analyses approach the ideal formula within $\pm$ 0.05 for each site. Several inferior analyses, which deviate from the ideal formula by more than 0.05 cations in each site and have adjusted sums less than 98% or greater than 102%, are included in order to preserve the data recorded in a traverse or the trend of rim to core compositional variations of a particular garnet crystal.

Garnet end-member calculation

The last six entries in each column represent calculated garnet end-member molecules based on the normalized cation values. The end-members are computed as follows:

Ad andradite $Ca_3Fe_2^{+3}Si_3O_{12}$
$100*[(Fe^{+3}+1.5Fe^{+3})/(Ca+Mg+Al+Mn+Fe^{+2}+Fe^{+3}+Cr)]$

Uv uvarovite $Ca_3Cr_2Si_3O_{12}$
$100*[(Cr+1.5Cr)/(Ca+Mg+Al+Mn+Fe^{+2}+Fe^{+3}+Cr)]$

Py pyrope $Mg_3Al_2Si_3O_{12}$
$100*[(Mg+0.67Mg)/(Ca+Mg+Al+Mn+Fe^{+2}+Fe^{+3}+Cr)]$

Al almandine $Fe_3^{+2}Al_2Si_3O_{12}$
$100*[(Fe^{+2}+0.67Fe^{+2})/(Ca+Mg+Al+Mn+Fe^{+2}+Fe^{+3}+Cr)]$

Sp spessartine $Mn_3Al_2Si_3O_{12}$
$100*[(Mn+0.67Mn)/(Ca+Mg+Al+Mn+Fe^{+2}+Fe^{+3}+Cr)]$

Gr grossular $Ca_3Al_2Si_3O_{12}$
$100*[(Ca+Al-0.67Mn-0.67Fe^{+2}-0.67Mg-1.5Cr-1.5Fe^{+3})/(Ca+Mg+Al+Mn+Fe^{+2}+Fe^{+3}+Cr)]$

A few analyses approach pure andradite compositions with virtually no Al resulting in negative Gr components; these analyses were normalized to 100% using only the positive end-member components. This method of calculation gives the same results for end-member garnet components as given by Deer, Howie and Zussman (1962).

Skarn A samples

84JH043

84JH044

85JH069

85JH070

84JH043 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA2-1	GA2-2	GA2-3	GA2-4	GA3-1
Point	(3)r	(3)m	(2)m			(4)vr/PG	(3)vr/PX	(3)vc	(3)vr/Q	
Optics	<					I/r				>
SiO2	36.12	35.54	35.12	35.28	35.14	37.92	37.09	36.97	37.36	36.64
Al2O3	1.46	0.22	0.60	0.35	2.55	4.05	4.38	3.50	4.05	3.24
FeO(T)	26.48	28.00	28.78	27.42	25.72	23.39	22.90	24.15	23.80	24.48
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	33.96	33.41	32.18	33.64	33.15	33.36	33.16	33.20	33.18	32.25
Na2O	0.01	0.00	0.02	0.01	0.00	0.01	0.00	0.01	0.01	0.01
TiO2	0.15	0.05	0.02	0.01	0.19	0.58	0.57	0.82	0.57	0.61
MnO	0.38	0.30	0.61	0.23	0.56	0.39	0.52	0.35	0.44	0.49
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.56	97.52	97.33	96.94	97.31	99.70	98.62	99.00	99.41	97.72
K2O	0.01	0.02	0.02	0.03	0.03	0.02	0.04	0.03	0.02	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	29.42	31.11	31.90	30.46	28.57	23.01	23.39	24.60	24.02	24.42
FeO(c)	0.00	0.00	0.07	0.00	0.00	2.68	1.85	2.01	2.18	2.50
Sum(adj)	101.50	100.63	100.52	99.98	100.16	102.00	100.96	101.46	101.81	100.16
Si	2.98	2.98	2.96	2.97	2.93	3.07	3.03	3.02	3.04	3.04
Al	0.02	0.02	0.04	0.03	0.07	0.00	0.00	0.00	0.00	0.00
Z	3.00	3.00	3.00	3.00	3.00	3.07	3.03	3.02	3.04	3.04
Al	0.13	0.01	0.02	0.01	0.19	0.46	0.46	0.36	0.43	0.36
Fe+3	1.83	1.97	2.02	1.93	1.80	1.40	1.44	1.51	1.47	1.53
Ti	0.01	0.00	0.00	0.00	0.01	0.04	0.04	0.05	0.03	0.04
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.97	1.98	2.04	1.94	2.00	1.90	1.94	1.92	1.93	1.93
Fe+2	0.00	0.00	0.01	0.00	0.00	0.18	0.13	0.14	0.15	0.17
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	3.01	3.01	2.91	3.04	2.97	2.89	2.91	2.91	2.89	2.87
Mn	0.03	0.02	0.04	0.02	0.04	0.03	0.04	0.02	0.03	0.03
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.04	3.03	2.96	3.06	3.01	3.10	3.08	3.07	3.07	3.07
Ad	91.38	97.99	98.42	96.20	88.85	71.67	73.00	76.92	74.58	77.55
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.00	0.00	0.16	0.00	0.00	6.20	4.29	4.65	5.03	5.89
Sp	0.89	0.71	1.41	0.55	1.31	0.91	1.22	0.82	1.03	1.17
Gr	7.74	1.29	0.00	3.26	9.84	21.22	21.49	17.61	19.36	15.39

B4JH0043 Garnet analyses

Grain	GA3-2	GA3-3	GA4
Point			(3)
Optics	<	I/r	>
SiO2	36.41	37.03	37.19
Al2O3	0.66	1.64	3.43
FeO(T)	27.92	26.88	24.05
MgO	0.00	0.00	0.00
CaO	32.56	32.69	32.77
Na2O	0.00	0.00	0.01
TiO2	0.07	0.11	0.08
MnO	0.52	0.56	0.50
Cr2O3	n.d.	n.d.	n.d.
Sum	98.14	98.91	98.83
K2O	0.01	0.00	0.02

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	29.51	27.72	23.70
FeO(c)	1.36	1.93	2.72
Sum(adj)	101.09	101.68	101.20
Si	3.04	3.05	3.05
Al	0.00	0.00	0.00
Z	3.04	3.05	3.05
Al	0.10	0.21	0.38
Fe+3	1.65	1.72	1.46
Ti	0.00	0.01	0.05
Cr	0.00	0.00	0.00
Y	1.95	1.94	1.89
Fe+2	0.09	0.13	0.19
Mg	0.00	0.00	0.00
Ca	2.91	2.89	2.88
Mn	0.04	0.04	0.03
Na	0.00	0.00	0.00
X	3.04	3.06	3.10
Ad	93.41	87.08	74.70
Uv	0.00	0.00	0.00
Py	0.00	0.00	0.00
Al	3.19	4.49	6.37
Sp	1.24	1.32	1.18
Gr	2.16	7.11	17.74

84JH044 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA2-6	GA1-7	GA1-8	GA1-9	GA1-10
Point	r	m	m	m	band	c	c	c	m	m
Optics	<					I/r				>
SiO2	37.23	37.09	37.24	36.75	35.99	36.79	36.72	36.94	35.46	36.85
Al2O3	1.46	2.02	1.10	0.03	0.20	2.41	1.97	2.29	0.32	0.30
FeO(T)	27.64	27.11	28.44	29.49	28.90	27.26	26.76	26.76	28.66	28.85
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	31.17	32.10	32.90	32.72	32.30	32.19	32.58	32.74	32.34	32.61
Na2O	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.16	0.25	0.02	0.04	0.02	0.09	0.05	0.03	0.03	0.04
MnO	0.64	0.73	0.56	0.47	0.57	0.71	0.64	0.69	0.63	0.60
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.30	99.30	100.27	99.50	97.99	99.45	98.72	99.45	97.44	99.25
K2O	0.02	0.02	0.03	0.05	0.01	0.03	0.03	0.00	0.01	0.02

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	26.18	27.11	29.62	31.01	30.90	27.94	28.00	28.01	31.45	30.15
FeO(c)	4.08	2.71	1.78	1.58	1.09	2.11	1.56	1.55	0.35	1.71
Sum(adj)	100.92	102.01	103.33	102.60	101.07	102.24	101.52	102.25	100.58	102.26
Si	3.10	3.05	3.04	3.03	3.01	3.02	3.03	3.02	2.99	3.05
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Z	3.10	3.05	3.04	3.03	3.01	3.02	3.03	3.02	3.00	3.05
Al	0.24	0.24	0.14	0.04	0.03	0.25	0.22	0.25	0.02	0.07
Fe+3	1.64	1.68	1.82	1.93	1.95	1.72	1.74	1.73	1.99	1.88
Ti	0.01	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.89	1.94	1.96	1.96	1.98	1.98	1.97	1.97	2.01	1.95
Fe+2	0.28	0.19	0.12	0.11	0.08	0.14	0.11	0.11	0.02	0.12
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	2.78	2.83	2.88	2.89	2.90	2.83	2.88	2.87	2.92	2.89
Mn	0.05	0.05	0.04	0.03	0.04	0.05	0.04	0.05	0.04	0.04
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.11	3.06	3.04	3.04	3.02	3.02	3.03	3.03	2.99	3.05
Ad	83.82	84.94	91.66	95.31	96.15	86.58	87.58	86.77	97.71	94.60
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	9.69	6.30	4.09	3.61	2.52	4.85	3.63	3.57	0.82	3.98
Sp	1.54	1.72	1.30	1.09	1.33	1.65	1.51	1.61	1.47	1.42
Gr	4.96	7.05	2.94	0.00	0.00	6.91	7.29	8.06	0.00	0.00

B4JH044 Garnet analyses

Grain	GA1-11	GA1-12	GA1-13	GA1-14	GA2	GA3	GA4	GA5-1	GA5-2	GA6-1
Point	band		band	r/0	[0]	[0]	[0]	(3)vc	v	vr/0
Optics	<					I/r				>
SiO2	36.90	35.96	36.45	36.66	36.40	36.30	36.57	36.68	36.16	36.60
Al2O3	2.13	0.08	2.14	2.32	0.83	2.56	1.16	1.68	1.61	1.24
FeO(T)	26.77	29.35	26.27	26.51	28.45	25.34	28.26	28.06	27.51	28.26
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	32.20	32.30	32.45	31.91	31.53	33.20	30.61	31.59	32.05	32.17
Na2O	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.08	0.02	0.07	0.21	0.07	0.08	0.16	0.12	0.15	0.04
MnO	0.62	0.61	0.57	0.66	0.84	0.30	1.13	0.70	0.55	0.54
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.70	98.33	97.96	98.28	98.12	97.78	97.89	98.83	98.03	98.85
K2O	0.00	0.01	0.00	0.03	0.01	0.04	0.02	0.03	0.02	0.02

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	27.17	31.53	27.58	26.76	29.01	27.45	27.50	28.08	28.62	29.14
FeO(c)	2.31	0.97	1.45	2.43	2.34	0.64	3.51	2.78	1.75	2.04
Sum(adj)	101.41	101.48	100.72	100.95	101.02	100.52	100.64	101.64	100.89	101.76
Si	3.05	3.00	3.03	3.04	3.04	3.01	3.07	3.04	3.01	3.03
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z	3.05	3.00	3.03	3.04	3.04	3.01	3.07	3.04	3.01	3.03
Al	0.25	0.01	0.24	0.27	0.12	0.26	0.18	0.20	0.17	0.15
Fe+3	1.69	1.99	1.73	1.67	1.83	1.71	1.73	1.75	1.80	1.82
Ti	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	1.99	1.97	1.95	1.95	1.97	1.92	1.96	1.98	1.97
Fe+2	0.16	0.07	0.10	0.17	0.16	0.04	0.25	0.19	0.12	0.14
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	2.85	2.89	2.89	2.83	2.82	2.95	2.75	2.80	2.86	2.85
Mn	0.04	0.04	0.04	0.05	0.06	0.02	0.08	0.05	0.04	0.04
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.00	3.03	3.05	3.04	3.01	3.08	3.04	3.02	3.03
Ad	85.34	96.40	86.87	84.41	92.11	86.03	88.07	88.24	90.19	91.35
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	5.39	2.20	3.38	5.68	5.51	1.48	9.34	6.49	4.10	4.74
Sp	1.46	1.40	1.35	1.56	2.00	0.71	2.72	1.65	1.30	1.27
Gr	7.81	0.00	8.40	8.35	0.37	11.78	0.87	3.61	4.41	2.64

84JH044 Garnet analyses

Grain	GA6-2	GA6-3	GA6-4	GA7-1	GA7-2
Point	vc	vc	vr/0	vc	vr/0
Optics	<		I/r		>
SiO2	35.65	35.65	37.23	36.44	37.01
Al2O3	1.09	0.96	0.47	2.28	1.90
FeO(T)	28.09	28.18	28.24	26.17	26.41
MgO	0.00	0.00	0.00	0.00	0.00
CaO	32.04	32.00	32.94	33.44	33.44
Na2O	0.00	0.00	0.00	0.01	0.00
TiO2	0.05	0.07	0.06	0.09	0.07
MnO	0.65	0.65	0.27	0.19	0.25
Cr2O3	0.00	0.00	0.00	0.00	0.00
Sum	97.57	97.51	99.21	98.62	99.08
K2O	0.01	0.00	0.06	0.02	0.03

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	30.14	30.16	29.05	28.44	27.99
FeO(c)	0.96	1.03	2.09	0.57	1.22
Sum(adj)	100.58	100.52	102.11	101.46	101.88
Si	2.99	2.99	3.07	3.00	3.04
Al	0.01	0.01	0.00	0.00	0.00
Z	3.00	3.00	3.07	3.00	3.04
Al	0.10	0.09	0.12	0.22	0.22
Fe+3	1.90	1.91	1.80	1.76	1.73
Ti	0.00	0.00	0.00	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00
Y	2.00	2.00	1.92	1.99	1.95
Fe+2	0.07	0.07	0.14	0.04	0.08
Mg	0.00	0.00	0.00	0.00	0.00
Ca	2.88	2.88	2.91	2.95	2.94
Mn	0.05	0.05	0.02	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00
X	3.00	3.00	3.07	3.00	3.04
Ad	95.07	95.33	91.58	88.37	87.24
Uv	0.00	0.00	0.00	0.00	0.00
Py	0.00	0.00	0.00	0.00	0.00
Al	2.26	2.42	4.90	1.31	2.82
Sp	1.54	1.54	0.64	0.44	0.59
Gr	1.14	0.70	2.89	9.87	9.35

B5JH069 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA2-1	GA2-2	GA2-3
Point	(2)v/Q	(2)mv	(2)v/PX5	(2)v/PX3	v/Q	mv	v/PX
Optics	<			I/r			>
SiO2	35.92	36.48	36.03	35.24	36.43	36.19	35.87
Al2O3	1.77	1.90	1.91	2.82	2.40	2.01	1.96
FeO(T)	27.03	26.91	27.25	25.74	26.60	26.69	26.94
MgO	0.20	0.20	0.18	0.17	0.19	0.19	0.22
CaO	32.81	33.11	32.83	32.86	32.25	32.88	32.90
Na2O	0.01	0.02	0.03	0.01	0.00	0.01	0.02
TiO2	0.10	0.22	0.13	0.29	0.16	0.15	0.33
MnO	0.28	0.23	0.41	0.50	0.27	0.20	0.32
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.12	99.07	98.97	97.63	98.30	98.32	98.56

Formula basis = 8 cations, 12 oxygens

Fe2O2(c)	29.68	29.10	30.21	28.60	27.58	28.88	29.68
FeO(c)	0.32	0.71	0.06	0.00	1.77	0.69	0.23
Sum(adj)	101.09	101.98	101.99	100.49	101.06	101.21	101.53
Si	2.98	3.00	2.97	2.93	3.01	2.99	2.96
Al	0.02	0.00	0.03	0.07	0.00	0.01	0.04
Z	3.00	3.00	3.00	3.00	3.01	3.00	3.00
Al	0.15	0.18	0.15	0.21	0.25	0.19	0.15
Fe+3	1.85	1.80	1.87	1.79	1.72	1.80	1.85
Ti	0.01	0.01	0.01	0.02	0.01	0.01	0.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.01	1.99	2.03	2.02	1.98	2.00	2.02
Fe+2	0.02	0.05	0.00	0.00	0.12	0.05	0.02
Mg	0.02	0.02	0.02	0.02	0.02	0.02	0.03
Ca	2.92	2.91	2.90	2.93	2.86	2.91	2.91
Mn	0.02	0.02	0.04	0.04	0.02	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.98	3.00	2.96	2.99	3.02	2.99	2.98
Ad	92.49	90.21	93.19	88.59	86.31	90.03	92.03
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.82	0.82	0.73	0.70	0.79	0.78	0.90
Al	0.73	1.64	0.13	0.00	4.12	1.61	0.52
Sp	0.66	0.54	1.41	1.16	0.64	0.47	0.75
Gr	5.29	6.79	4.52	9.55	8.15	7.12	5.80

B5JH070 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA1-6	GA1-7	GA2-1	GA2-2	GA3-1
Point	(3)v/0	mv	mv	mv	v/PX1	v/PX1	v/PX1	r/FS	c	r/PX
Optics	<					I/r				>
SiO2	35.74	35.52	35.52	35.16	35.50	36.29	35.73	36.03	35.86	35.26
Al2O3	2.65	2.67	1.13	2.90	3.14	5.34	3.58	4.09	3.45	3.76
FeO(T)	25.68	26.55	28.01	25.76	24.49	21.44	24.68	23.44	25.47	23.72
MgO	0.18	0.18	0.17	0.17	0.20	0.19	0.21	0.19	0.22	0.17
CaO	33.05	32.71	32.80	32.41	33.32	33.78	33.21	32.84	32.40	34.11
Na2O	0.01	0.01	0.02	0.00	0.02	0.00	0.02	0.02	0.00	0.00
TiO2	0.07	0.18	0.03	0.46	0.18	0.71	0.31	0.50	0.22	0.02
MnO	0.29	0.62	0.32	0.73	0.45	0.25	0.37	0.50	0.58	0.22
Cr2O3	0.00	0.00	0.02	0.02	0.00	0.01	0.00	0.00	0.00	0.01
Sum	97.67	98.44	98.02	97.61	97.30	98.01	98.11	97.61	98.20	97.27
K2O	0.01	0.02	0.07	0.06	0.02	0.00	0.05	0.06	0.04	0.09
F	0.00	0.00	0.35	0.00	0.00	0.19	0.00	0.00	0.00	0.00
Cl	0.02	0.02	0.20	0.00	0.06	0.00	0.00	0.00	0.05	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	28.53	29.50	31.12	28.62	27.21	23.64	27.42	25.47	27.65	26.35
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.52	0.59	0.00
Sum(adj)	100.52	101.39	101.13	100.47	100.02	100.37	100.85	100.15	100.96	99.90
Si	2.97	2.93	2.96	2.93	2.95	2.97	2.94	2.98	2.96	2.92
Al	0.03	0.07	0.04	0.07	0.05	0.03	0.06	0.02	0.04	0.08
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.23	0.19	0.07	0.21	0.26	0.49	0.29	0.38	0.30	0.29
Fe+2	1.78	1.83	1.95	1.79	1.70	1.46	1.70	1.58	1.72	1.64
Ti	0.00	0.01	0.00	0.03	0.01	0.04	0.02	0.03	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.01	2.04	2.02	2.04	1.97	1.99	2.01	1.99	2.03	1.93
Fe+2	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.04	0.00
Mg	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.02
Ca	2.94	2.89	2.93	2.89	2.97	2.96	2.93	2.91	2.87	3.03
Mn	0.02	0.04	0.02	0.05	0.03	0.02	0.03	0.04	0.04	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.99	2.96	2.98	2.96	3.03	3.01	2.99	3.01	2.97	3.07
Ad	88.69	90.69	96.87	88.89	84.53	73.03	84.48	79.45	85.43	80.93
Uv	0.00	0.00	0.07	0.07	0.00	0.03	0.00	0.00	0.00	0.03
Py	0.74	0.73	0.70	0.70	0.82	0.78	0.86	0.78	0.90	0.69
Al	0.00	0.00	0.00	0.00	0.00	0.37	0.00	1.20	1.34	0.00
Sp	0.68	1.43	0.75	1.70	1.05	0.58	0.86	1.17	1.35	0.51
Gr	9.89	7.14	1.61	8.64	13.60	25.21	13.81	17.39	10.98	17.84

85JH070 Garnet analyses

Slide a		Slide b						
Grain	GA3-2	GA1-1	GA1-2	GA1-3	GA2	GA3	GA4	GA5
Point	m	c	m	r				(2)
Optics	⟨			I/r				⟩
SiO2	35.64	36.05	36.02	35.63	36.46	36.79	36.37	35.84
Al2O3	4.54	4.00	4.19	3.18	6.41	6.33	7.46	3.46
FeO(T)	22.98	24.07	25.10	24.47	20.57	21.14	21.57	24.22
MgO	0.25	0.22	0.21	0.24	0.27	0.19	0.54	0.23
CaO	33.24	32.82	32.17	33.35	33.50	34.12	31.73	33.42
Na2O	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.02
TiO2	0.63	0.25	0.69	0.13	0.98	0.38	0.72	0.59
MnO	0.45	0.48	0.62	0.41	0.47	0.30	0.29	0.35
Cr2O3	0.02	0.00	0.00	0.01	0.06	0.00	0.03	0.01
Sum	97.76	97.89	99.01	97.42	98.73	99.25	98.71	98.14
K2O	0.06	0.06	0.06	0.00	0.02	0.01	0.22	0.03
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.00	0.04	0.00	0.03	0.00	0.07	0.05	0.03

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	25.53	26.29	26.30	27.19	22.24	23.49	21.49	26.91
FeO(c)	0.00	0.40	1.42	0.00	0.55	0.00	2.23	0.00
Sum(adj)	100.31	100.52	101.64	100.14	100.95	101.60	100.86	100.83
Si	2.94	2.97	2.95	2.96	2.95	2.96	2.94	2.95
Al	0.06	0.03	0.05	0.04	0.05	0.04	0.06	0.05
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.38	0.36	0.35	0.27	0.57	0.56	0.66	0.29
Fe+3	1.58	1.63	1.62	1.70	1.36	1.42	1.31	1.67
Ti	0.04	0.02	0.04	0.01	0.06	0.02	0.04	0.04
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.00	2.01	2.01	1.98	1.99	2.01	2.01	1.99
Fe+2	0.00	0.03	0.10	0.00	0.04	0.00	0.15	0.00
Mg	0.03	0.03	0.03	0.03	0.03	0.02	0.07	0.03
Ca	2.93	2.90	2.82	2.97	2.91	2.95	2.75	2.95
Mn	0.03	0.03	0.04	0.03	0.03	0.02	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.00	2.99	2.99	3.02	3.01	2.99	2.99	3.01
Ad	78.80	81.46	90.83	84.32	68.05	71.00	65.33	83.28
Uv	0.06	0.00	0.00	0.03	0.19	0.00	0.10	0.03
Pv	1.02	0.90	0.85	0.98	1.09	0.76	2.17	0.94
Al	0.00	0.93	3.35	0.00	1.26	0.00	5.02	0.00
Sp	1.04	1.12	1.43	0.96	1.09	0.69	0.66	0.81
Gr	19.07	15.60	13.63	13.70	28.33	27.56	26.72	14.93

Skarn B samples

85JH096

85JH098

451-82*

OVL-3*

451-332*

* These 3 samples are from Santa Fe Mining Company's Overlook Property, courtesy of Lisa Perry.

85JH096 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA2-3	GA2-4	GA2-5	GA2-6	GA3-1	GA3-2
Point	c(3)	r(3)	c	r	c	r	c	r	r	c
Optics	<				A/c					>
SiO2	37.05	38.58	38.53	38.88	37.89	38.57	37.86	38.86	38.08	37.01
Al2O3	13.53	14.11	13.72	14.91	14.56	14.56	12.52	15.11	13.19	13.21
FeO(T)	10.95	12.13	11.11	11.54	10.13	10.73	12.37	10.36	12.66	11.49
MgO	0.25	0.19	0.24	0.17	0.25	0.16	0.22	0.17	0.17	0.29
CaO	36.35	36.20	35.96	36.41	36.59	36.30	36.33	36.43	35.61	35.94
Na2O	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.01	0.01	0.00
TiO2	1.91	0.32	1.78	0.10	1.74	0.24	1.60	0.06	0.46	1.78
MnO	0.19	0.25	0.21	0.21	0.26	0.27	0.18	0.29	0.40	0.13
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	100.23	101.78	101.56	102.24	101.43	100.83	101.08	101.29	100.58	99.85
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00
F	0.38	0.00	0.20	0.00	0.03	0.00	0.07	0.00	0.35	0.52
Cl	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	12.17	13.48	11.33	12.82	11.25	11.92	13.74	11.51	14.07	12.77
FeO(c)	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.45	103.13	102.69	103.52	102.55	102.02	102.45	102.44	101.99	101.13
Si	2.88	2.94	2.95	2.94	2.90	2.96	2.92	2.96	2.95	2.89
Al	0.12	0.06	0.05	0.06	0.10	0.04	0.08	0.04	0.05	0.11
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	1.11	1.21	1.19	1.27	1.21	1.28	1.06	1.32	1.15	1.10
Fe+3	0.71	0.77	0.65	0.73	0.65	0.69	0.80	0.66	0.82	0.75
Ti	0.11	0.02	0.10	0.01	0.10	0.01	0.09	0.00	0.03	0.10
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	2.00	1.95	2.01	1.96	1.98	1.96	1.98	2.00	1.95
Fe+2	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.02	0.03
Ca	3.02	2.96	2.95	2.95	3.00	2.98	3.01	2.98	2.95	3.00
Mn	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.02	0.03	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.06	3.00	3.05	2.99	3.04	3.02	3.04	3.02	3.00	3.05
Ad	35.44	38.38	33.04	36.18	32.36	34.24	40.08	32.80	40.78	37.39
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.96	0.72	0.93	0.63	0.95	0.61	0.85	0.64	0.65	1.12
Al	0.00	0.00	1.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.42	0.54	0.46	0.45	0.56	0.58	0.39	0.62	0.87	0.29
Gr	63.18	60.37	63.60	62.74	66.13	64.57	58.68	65.93	57.69	61.20

85JH096 Garnet analyses

Grain	GA3-3	GA4-1	GA4-2	GA5-1	GA5-2	GA5-3	GA5-4	GA5-5	GA5-6	GA5-7
Point	r	r	c	r						c
Optics	A/c	< A/c >		A/c	traverse across zoned rim towards core			I/y	I/y	I/y
SiO2	39.10	38.02	37.81	37.62	38.22	36.98	35.91	35.49	35.35	35.71
Al2O3	17.77	13.87	12.24	8.04	11.59	5.70	0.62	0.28	0.01	0.00
FeO(T)	7.15	10.28	12.06	19.00	14.83	21.81	28.07	28.98	29.46	29.31
MgO	0.17	0.24	0.24	0.18	0.21	0.22	0.23	0.18	0.22	0.22
CaO	36.33	35.96	36.22	35.01	35.68	35.11	33.95	33.58	33.61	33.60
Na2O	0.01	0.02	0.00	0.01	0.01	0.02	0.03	0.02	0.01	0.02
TiO2	0.12	1.77	1.70	0.04	0.03	0.22	0.00	0.00	0.01	0.00
MnO	0.44	0.25	0.17	0.23	0.26	0.19	0.15	0.15	0.22	0.20
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	101.09	100.41	100.44	100.13	100.83	100.25	98.96	98.68	98.89	99.06
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.02	0.01
F	0.16	0.14	0.32	0.00	0.00	0.00	0.18	0.07	0.09	0.06
Cl	0.00	0.00	0.00	0.05	0.08	0.00	0.03	0.07	0.09	0.05
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	7.94	11.19	13.40	21.11	16.48	24.23	31.19	32.20	32.73	32.56
FeO(c)	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.88	101.53	101.78	102.24	102.48	102.67	102.08	101.90	102.16	102.31
Si	2.96	2.94	2.94	2.98	2.97	2.95	2.96	2.94	2.93	2.95
Al	0.04	0.06	0.06	0.02	0.03	0.05	0.04	0.03	0.00	0.00
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.97	2.93	2.95
Al	1.55	1.21	1.06	0.73	1.03	0.49	0.02	0.00	0.00	0.00
Fe+3	0.45	0.65	0.78	1.26	0.96	1.46	1.94	2.01	2.04	2.03
Ti	0.01	0.10	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.00	1.96	1.94	1.99	1.99	1.96	1.96	2.01	2.04	2.03
Fe+2	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.03	0.03	0.02	0.02	0.03	0.03	0.02	0.03	0.03
Ca	2.95	2.98	3.02	2.97	2.97	3.00	3.00	2.98	2.98	2.98
Mn	0.03	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.00	3.04	3.06	3.01	3.01	3.04	3.04	3.02	3.03	3.02
Ad	22.48	32.88	39.49	62.70	47.82	72.29	96.11	98.92	98.62	98.66
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.64	0.93	0.94	0.71	0.81	0.87	0.94	0.73	0.88	0.88
Al	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.94	0.55	0.38	0.51	0.57	0.43	0.35	0.35	0.50	0.46
Gr	75.95	65.18	59.19	36.08	50.81	26.42	2.61	0.00	0.00	0.00

85JH096 Garnet analyses

Grain	GA6-1	GA6-2	GA7-1	GA7-2
Point	c	r	c	r
Optics	A/c	A/c	I/y	A/c
SiO2	37.48	38.44	35.67	37.72
Al2O3	12.85	14.20	0.22	9.71
FeO(T)	10.93	10.50	29.31	17.19
MgO	0.28	0.18	0.21	0.20
CaO	36.08	36.30	33.76	34.88
Na2O	0.00	0.00	0.01	0.02
TiO2	1.90	0.17	0.01	0.08
MnO	0.16	0.29	0.16	0.25
Cr2O3	n.d.	n.d.	n.d.	n.d.
Sum	99.68	100.08	99.35	100.05
K2O	0.00	0.00	0.06	0.00
F	0.49	0.00	0.13	0.00
Cl	0.00	0.00	0.00	0.0

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	12.14	11.67	32.56	19.10
FeO(c)	0.00	0.00	0.00	0.00
Sum(Adj)	100.89	101.25	102.60	101.96
Si	2.93	2.97	2.94	2.97
Al	0.07	0.03	0.02	0.03
Z	3.00	3.00	2.96	3.00
Al	1.11	1.27	0.00	0.87
Fe+3	0.71	0.68	2.02	1.13
Ti	0.11	0.01	0.00	0.00
Cr	0.00	0.00	0.00	0.00
Y	1.94	1.95	2.02	2.01
Fe+2	0.00	0.00	0.00	0.00
Mg	0.03	0.02	0.03	0.02
Ca	3.02	3.01	2.98	2.95
Mn	0.01	0.02	0.01	0.02
Na	0.00	0.00	0.00	0.00
X	3.06	3.05	3.02	2.99
Ad	35.98	33.80	98.79	56.40
Uv	0.00	0.00	0.00	0.00
Py	1.10	0.69	0.84	0.78
Al	0.00	0.00	0.00	0.00
Sp	0.36	0.63	0.36	0.56
Gr	62.57	64.88	0.00	42.26

85JH098 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA2-1	GA3-1	GA4-1	GA4-2	GA5-1	GA5-2
Point	c	oc	ir	or	r/Q	r/Q	r/OP	c	c	(3)r
Optics	<	A/c		>	A/c	A/c	<	A/c >	I/y	A/c
SiO2	37.57	38.45	37.34	37.30	37.93	37.26	37.43	37.06	35.32	37.15
Al2O3	11.69	14.31	9.16	8.51	12.38	9.49	8.62	8.98	0.43	12.61
FeO(T)	12.95	9.56	16.36	17.38	11.76	16.04	17.20	16.34	28.27	11.62
MgO	0.19	0.19	0.21	0.19	0.19	0.19	0.19	0.20	0.20	0.20
CaO	34.57	35.25	34.92	34.40	35.49	34.34	34.37	34.33	32.89	34.94
Na2O	0.02	0.01	0.00	0.01	0.02	0.01	0.00	0.02	0.02	0.01
TiO2	0.09	0.11	0.14	0.06	0.08	0.13	0.01	0.08	0.00	0.59
MnO	0.32	0.32	0.19	0.28	0.39	0.36	0.23	0.36	0.20	0.37
Cr2O3	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Sum	97.43	98.23	98.34	98.14	98.24	97.82	98.05	97.38	97.33	97.49
K2O	0.00	0.02	0.00	0.03	0.03	0.04	0.00	0.05	0.03	0.00
F	0.01	0.10	0.01	0.09	0.06	0.11	0.02	0.09	0.02	0.55
Cl	0.01	0.05	0.00	0.02	0.00	0.09	0.00	0.07	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	14.39	10.40	18.18	19.31	13.07	17.82	18.93	18.15	31.41	12.91
FeO(c)	0.00	0.20	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00
Sum(Adj)	98.87	99.27	100.16	100.07	99.55	99.60	99.94	99.19	100.47	98.78
Si	3.01	3.02	2.99	3.00	3.00	3.00	3.02	3.00	2.97	2.96
Al	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.04
Z	3.01	3.02	3.00	3.00	3.00	3.00	3.02	3.00	3.00	3.00
Al	1.10	1.33	0.86	0.81	1.15	0.90	0.82	0.86	0.01	1.15
Fe+3	0.87	0.62	1.10	1.17	0.78	1.08	1.15	1.11	1.99	0.78
Ti	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.98	1.95	1.96	1.98	1.94	1.99	1.97	1.97	2.00	1.96
Fe+2	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Mg	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Ca	2.97	2.97	3.00	2.97	3.01	2.96	2.97	2.98	2.96	2.99
Mn	0.02	0.02	0.01	0.02	0.03	0.02	0.02	0.02	0.01	0.03
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.01	3.03	3.04	3.01	3.06	3.01	3.02	3.03	3.00	3.04
Ad	43.50	30.95	54.81	58.64	38.97	54.09	57.61	55.40	98.70	38.78
Uv	0.10	0.09	0.06	0.03	0.00	0.00	0.00	0.03	0.00	0.00
Py	0.76	0.75	0.84	0.76	0.75	0.76	0.76	0.81	0.83	0.79
Al	0.00	0.45	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00
Sp	0.73	0.72	0.43	0.64	0.87	0.82	0.53	0.83	0.47	0.84
Gr	54.92	67.04	43.85	39.93	59.40	44.33	40.75	42.93	0.00	59.59

85JH098 Garnet analyses

Grain	GA6-1	GA6-2	GA7-1	GA8-1
Point	c	r	c	r/EP1
Optics	<	A/c		>
SiO2	37.69	38.12	37.16	36.44
Al2O3	12.74	11.34	8.78	9.28
FeO(T)	10.43	13.18	17.26	16.30
MgO	0.22	0.18	0.20	0.20
CaO	35.15	35.18	34.40	34.93
Na2O	0.03	0.01	0.01	0.01
TiO2	2.08	0.01	0.07	0.06
MnO	0.35	0.39	0.27	0.25
Cr2O3	0.05	0.02	0.02	0.02
Sum	98.74	98.43	98.17	97.49
K2O	0.02	0.01	0.05	0.02
F	0.58	0.20	0.00	0.06
Cl	0.39	0.00	0.00	0.03

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	10.46	14.64	19.18	18.11
FeO(c)	1.02	0.00	0.00	0.00
Sum(Adj)	99.78	99.89	100.09	99.30
Si	2.97	3.02	2.99	2.94
Al	0.03	0.00	0.01	0.06
Z	3.00	3.02	3.00	3.00
Al	1.16	1.06	0.82	0.83
Fe+3	0.62	0.87	1.16	1.10
Ti	0.12	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00
Y	1.91	1.94	1.99	1.93
Fe+2	0.07	0.00	0.00	0.00
Mg	0.03	0.02	0.02	0.02
Ca	2.97	2.99	2.97	3.02
Mn	0.02	0.03	0.02	0.02
Na	0.00	0.00	0.00	0.00
X	3.09	3.04	3.01	3.07
Ad	31.71	43.94	58.02	54.49
Uv	0.16	0.06	0.06	0.06
Py	0.88	0.71	0.80	0.80
Al	2.29	0.00	0.00	0.00
Sp	0.80	0.88	0.61	0.57
Gr	64.16	54.40	40.51	44.08

451-82 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2
Area	A		B	
Optics	<		A/c	>
SiO2	36.91	36.38	36.10	37.03
Al2O3	13.95	6.56	9.87	10.66
FeO(T)	10.00	20.11	16.14	15.67
MgO	0.23	0.20	0.19	0.22
CaO	34.50	33.69	33.71	33.84
Na2O	0.02	0.01	0.01	0.00
TiO2	1.97	0.05	0.09	0.13
MnO	0.32	0.16	0.20	0.24
Cr2O3	0.01	0.00	0.02	0.00
Sum	97.91	97.16	96.33	97.79
K2O	0.01	0.00	0.06	0.02
F	0.56	0.00	0.00	0.12
Cl	0.07	0.00	0.03	0.01

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	10.14	22.34	17.93	16.96
FeO(c)	0.88	0.00	0.00	0.40
Sum(Adj)	98.92	99.39	98.12	99.48
Si	2.93	2.98	2.95	2.97
Al	0.07	0.02	0.05	0.03
Z	3.00	3.00	3.00	3.00
Al	1.23	0.62	0.90	0.98
Fe+3	0.61	1.38	1.10	1.03
Ti	0.12	0.00	0.01	0.01
Cr	0.00	0.00	0.00	0.00
Y	1.96	2.00	2.01	2.02
Fe+2	0.06	0.00	0.00	0.03
Mg	0.03	0.02	0.02	0.03
Ca	2.93	2.96	2.95	2.91
Mn	0.02	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00
X	3.04	3.00	2.99	2.98
Ad	30.57	68.82	54.66	51.10
Uv	0.03	0.00	0.06	0.00
Py	0.92	0.81	0.77	0.88
Al	1.96	0.00	0.00	0.90
Sp	0.73	0.37	0.46	0.54
Gr	65.79	30.00	44.05	46.58

OVL-3 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA2-3	GA2-4	GA3-1	GA3-2	GA4-1	GA4-2
Point	(3)	(3)	(3)c	(3)oc	(3)ir	(3)or	(3)c	(3)r	(3)c	(3)r/0
Optics	<			A/c				>	I/y	A/c
SiO2	37.42	37.67	37.81	37.93	37.71	38.34	38.38	37.67	38.57	37.02
Al2O3	10.19	8.89	14.34	12.23	10.17	11.05	14.74	11.57	13.88	8.22
FeO(T)	16.08	18.17	10.40	13.66	16.28	16.02	10.02	14.72	11.96	18.86
MgO	0.18	0.19	0.19	0.20	0.20	0.21	0.20	0.19	0.20	0.21
CaO	34.98	34.98	35.37	35.49	35.08	34.75	35.09	34.97	35.07	34.43
Na2O	0.02	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
TiO2	0.08	0.02	1.36	0.42	0.15	0.08	1.49	0.17	0.99	0.03
MnO	0.24	0.20	0.40	0.24	0.22	0.33	0.39	0.33	0.37	0.27
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	99.19	100.12	99.88	100.18	99.82	100.78	100.32	99.63	101.05	99.05

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	17.86	20.19	11.19	15.18	18.09	17.04	9.49	16.35	11.84	20.95
FeO(c)	0.00	0.00	0.33	0.00	0.00	0.68	1.48	0.00	1.30	0.00
Sum(Adj)	100.97	102.14	101.00	101.70	101.63	102.48	101.27	101.26	102.23	101.14
Si	2.97	2.98	2.94	2.96	2.97	2.99	2.97	2.96	2.97	2.96
Al	0.03	0.02	0.06	0.04	0.03	0.01	0.03	0.04	0.03	0.04
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.92	0.80	1.25	1.08	0.92	1.00	1.31	1.03	1.23	0.74
Fe+3	1.07	1.20	0.65	0.89	1.07	1.00	0.55	0.97	0.69	1.26
Ti	0.00	0.00	0.08	0.02	0.01	0.00	0.09	0.01	0.06	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.99	2.00	1.98	2.00	2.00	2.01	1.95	2.01	1.97	2.00
Fe+2	0.00	0.00	0.02	0.00	0.00	0.04	0.10	0.00	0.08	0.00
Mg	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03
Ca	2.97	2.96	2.94	2.96	2.96	2.90	2.91	2.94	2.89	2.95
Mn	0.02	0.01	0.03	0.02	0.01	0.02	0.03	0.02	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.01	3.00	3.02	3.00	3.00	2.99	3.05	2.99	3.03	3.00
Ad	53.00	59.71	32.85	44.36	53.44	49.90	27.92	48.09	34.53	62.68
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.71	0.74	0.74	0.77	0.78	0.81	0.78	0.74	0.77	0.83
Al	0.00	0.00	0.71	0.00	0.00	1.49	3.22	0.00	2.81	0.00
Sp	0.54	0.44	0.88	0.53	0.49	0.73	0.86	0.73	0.81	0.61
Gr	45.75	39.10	64.82	54.34	45.29	47.07	67.22	50.44	61.08	35.88

OVL-3 Garnet analyses

Grain	GA5-1	GA5-2	GA6-1	GA6-2	GA7-1	GA7-2
Point	(3)c	(3)r	c	r/EP1	r/EP1	c
Optics	I/y	A/c	<		A/c	>
SiO2	34.83	37.43	38.25	37.56	36.86	37.12
Al2O3	0.03	9.02	12.20	9.78	9.31	11.19
FeO(T)	28.88	17.90	13.42	17.11	17.05	13.97
MgO	0.21	0.20	0.19	0.21	0.21	0.22
CaO	33.17	34.82	34.87	34.09	34.66	34.52
Na2O	0.00	0.02	0.01	0.00	0.00	0.00
TiO2	0.01	0.08	0.33	0.07	0.09	1.38
MnO	0.24	0.25	0.20	0.25	0.22	0.36
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.37	99.72	99.47	99.07	98.40	98.76

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	32.09	19.89	14.05	18.26	18.94	14.81
FeO(c)	0.00	0.00	0.77	0.67	0.00	0.64
Sum(Adj)	100.58	101.71	100.87	100.89	100.29	100.24
Si	2.93	2.97	3.00	2.99	2.95	2.95
Al	0.00	0.03	0.00	0.01	0.05	0.05
Z	2.93	3.00	3.00	3.00	3.00	3.00
Al	0.00	0.81	1.13	0.91	0.83	1.00
Fe+3	2.03	1.19	0.83	1.09	1.14	0.89
Ti	0.00	0.00	0.02	0.00	0.01	0.08
Cr	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.03	2.00	1.98	2.01	1.98	1.97
Fe+2	0.00	0.00	0.05	0.04	0.00	0.04
Mg	0.03	0.02	0.02	0.02	0.03	0.03
Ca	2.99	2.96	2.93	2.91	2.98	2.94
Mn	0.02	0.02	0.01	0.02	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.00	3.02	2.99	3.02	3.03
Ad	98.59	58.99	41.70	54.65	56.69	44.59
Uv	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.85	0.78	0.75	0.83	0.83	0.88
Al	0.00	0.00	1.69	1.49	0.00	1.43
Sp	0.55	0.56	0.45	0.56	0.50	0.81
Gr	0.00	39.66	55.41	42.46	41.99	52.29

451-332 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA3-1	GA3-2	GA3-3	GA3-4	GA4-1	GA4-2	GA4-3
Point	(3)c	(3)r/EP1	r/EP1	r/I1	r	ir	c	r	ir	oc
Optics	A/c	A/c	A/c	A/c	I/c	A/c	I/c	A/c	I/c	A/c
SiO2	37.50	37.58	37.40	37.22	38.00	38.18	37.38	37.28	38.14	38.06
Al2O3	14.60	9.82	10.30	8.34	11.38	12.46	15.43	9.29	12.95	12.70
FeO(T)	9.75	17.26	16.52	19.01	14.70	14.05	9.34	17.97	13.16	13.30
MgO	0.46	0.23	0.22	0.18	0.33	0.25	0.35	0.24	0.26	0.22
CaO	36.05	34.86	34.89	34.42	34.90	35.31	36.46	34.21	35.42	35.36
Na2O	0.01	0.01	0.01	0.02	0.00	0.01	0.00	0.01	0.00	0.00
TiO2	1.38	0.18	0.22	0.31	0.98	0.10	0.32	0.20	0.27	0.05
MnO	0.27	0.28	0.24	0.27	0.37	0.26	0.31	0.29	0.50	0.19
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	100.02	100.22	99.80	99.77	100.66	100.62	99.59	99.49	100.70	99.88

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	10.83	19.18	18.35	21.12	15.62	15.61	10.38	19.79	14.62	14.78
FeO(c)	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.16	0.00	0.00
Sum(Adj)	101.10	102.14	101.63	101.88	102.22	102.18	100.63	101.47	102.16	101.36
Si	2.90	2.96	2.95	2.96	2.96	2.96	2.89	2.96	2.95	2.97
Al	0.10	0.04	0.05	0.04	0.04	0.04	0.11	0.04	0.05	0.03
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	1.23	0.87	0.91	0.74	1.01	1.10	1.30	0.83	1.13	1.14
Fe+3	0.63	1.14	1.09	1.26	0.92	0.91	0.60	1.18	0.85	0.87
Ti	0.08	0.01	0.01	0.02	0.06	0.01	0.02	0.01	0.02	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	2.01	2.01	2.02	1.98	2.02	1.92	2.03	2.00	2.01
Fe+2	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00	0.00
Mg	0.05	0.03	0.03	0.02	0.04	0.03	0.04	0.03	0.03	0.03
Ca	2.99	2.94	2.95	2.93	2.91	2.93	3.02	2.91	2.94	2.96
Mn	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.06	2.99	2.99	2.98	3.02	2.98	3.08	2.97	3.00	2.99
Ad	31.40	56.42	54.06	62.97	45.99	45.27	29.65	58.89	42.30	43.12
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	1.76	0.90	0.86	0.71	1.29	0.96	1.32	0.94	1.00	0.85
Al	0.00	0.00	0.00	0.00	1.40	0.00	0.00	0.35	0.00	0.00
Sp	0.59	0.62	0.53	0.61	0.82	0.57	0.67	0.65	1.09	0.42
Gr	66.25	42.06	44.55	35.72	50.50	53.20	68.37	39.17	55.62	55.61

451-332 Garnet analyses

Grain	GA4-4	GA5-1	GA5-2	GA5-3	GA6-2	GA6-3	GA7-1	GA7-2
Point	c	c	ir	or	/EP3	c	c	r
Optics	I/c	A/c	I/c	A/c	A/c	A/c	I/c	A/c
SiO2	37.38	37.91	37.70	38.05	38.68	38.34	37.11	37.87
Al2O3	15.02	14.80	12.48	13.11	14.27	14.67	16.18	12.50
FeO(T)	9.14	9.26	12.77	13.02	11.43	10.15	8.83	11.01
MgO	0.46	0.45	0.30	0.20	0.31	0.29	0.42	0.41
CaO	35.90	35.58	35.48	35.35	35.63	36.12	36.11	35.57
Na2O	0.00	0.00	0.00	0.03	0.02	0.02	0.01	0.01
TiO2	1.95	2.15	0.67	0.31	0.40	0.84	0.47	2.64
MnO	0.29	0.29	0.43	0.29	0.39	0.22	0.28	0.24
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	100.14	100.44	99.83	100.36	101.13	100.65	99.41	100.25

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	10.15	9.64	14.19	14.47	12.70	11.28	9.81	11.05
FeO(c)	0.00	0.58	0.00	0.00	0.00	0.00	0.00	1.06
Sum(Adj)	101.15	101.40	101.25	101.81	102.40	101.78	100.39	101.35
Si	2.89	2.92	2.94	2.95	2.96	2.95	2.87	2.95
Al	0.11	0.08	0.06	0.05	0.04	0.05	0.13	0.05
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	1.25	1.27	1.09	1.15	1.25	1.27	1.34	1.10
Fe+3	0.59	0.56	0.83	0.84	0.73	0.65	0.57	0.65
Ti	0.11	0.12	0.04	0.02	0.02	0.05	0.03	0.15
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.96	1.95	1.97	2.01	2.01	1.98	1.94	1.90
Fe+2	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.07
Mg	0.05	0.05	0.03	0.02	0.04	0.03	0.05	0.05
Ca	2.97	2.94	2.97	2.94	2.93	2.97	2.99	2.97
Mn	0.02	0.02	0.03	0.02	0.03	0.01	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.04	3.05	3.03	2.99	2.99	3.02	3.06	3.10
Ad	29.51	28.25	41.56	42.02	36.56	32.59	27.96	33.08
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	1.77	1.74	1.16	0.77	1.18	1.11	1.58	1.62
Al	0.00	1.26	0.00	0.00	0.00	0.00	0.00	2.36
Sp	0.63	0.64	0.95	0.63	0.84	0.48	0.60	0.54
Gr	68.09	68.10	56.33	56.58	61.42	65.83	69.86	62.40

Skarn C samples

85JH078

85JH079

85JH080

85JH086

85JH087

85JH088

85JH078 Garnet analyses

Grain	GA1	GA2	GA3-1	GA3-2	GA3-3	GA3-4	GA4-1	GA4-2	GA5	GA6
Point	(2)	(2)	c	m	m	r		c	(2)	
Notes	I/r	I/r	<		I-A zoning/r	>	I/r	I/r	/c	A/v
SiO2	36.50	37.44	37.36	36.70	37.27	37.62	37.47	36.58	35.41	36.01
Al2O3	8.32	11.22	11.92	7.96	9.17	11.34	11.29	8.40	0.22	7.48
FeO(T)	17.06	14.65	13.72	19.12	17.35	15.43	14.42	18.04	28.14	19.29
MgO	0.03	0.18	0.03	0.03	0.05	0.06	0.05	0.01	0.00	0.00
CaO	34.34	34.69	34.96	34.45	34.51	34.45	35.14	34.42	33.09	34.96
Na2O	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	1.70	0.56	0.60	0.00	0.70	0.16	1.06	0.39	0.00	0.54
MnO	0.22	0.25	0.22	0.16	0.15	0.20	0.23	0.19	0.16	0.23
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.20	99.00	98.83	98.42	99.20	99.26	99.66	98.03	97.02	98.41

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	18.03	16.05	15.11	21.24	18.46	16.39	15.56	20.04	31.26	21.43
FeO(c)	0.85	0.21	0.12	0.00	0.74	0.68	0.41	0.00	0.00	0.00
Sum(Adj)	100.00	100.60	100.34	100.54	101.04	100.90	101.21	100.03	100.14	100.55
Si	2.95	2.97	2.96	2.96	2.97	2.97	2.95	2.96	2.99	2.91
Al	0.05	0.03	0.04	0.04	0.03	0.03	0.05	0.04	0.01	0.09
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.75	1.01	1.07	0.72	0.84	1.03	1.00	0.76	0.01	0.63
Fe+3	1.10	0.96	0.90	1.29	1.11	0.98	0.92	1.22	1.99	1.30
Ti	0.10	0.03	0.04	0.00	0.04	0.01	0.06	0.02	0.00	0.03
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.95	2.00	2.01	2.01	1.99	2.02	1.99	2.00	2.00	1.96
Fe+2	0.06	0.01	0.01	0.00	0.05	0.04	0.03	0.00	0.00	0.00
Mg	0.00	0.02	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Ca	2.98	2.94	2.97	2.98	2.95	2.92	2.97	2.98	2.99	3.02
Mn	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.00	2.99	2.99	3.01	2.98	3.01	3.00	3.00	3.04
Ad	55.51	47.84	44.97	63.98	55.57	48.61	46.27	60.78	99.06	64.52
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.12	0.71	0.12	0.12	0.20	0.24	0.20	0.04	0.00	0.00
Al	1.95	0.45	0.26	0.00	1.65	1.50	0.91	0.00	0.00	2.00
Sp	0.51	0.56	0.49	0.36	0.34	0.45	0.51	0.43	0.38	0.52
Gr	41.91	50.44	54.16	35.54	42.24	49.21	52.11	38.75	0.56	34.96

85JH078 Garnet analyses

Grain	GA7	GA8	GA9-1	GA9-2
Point		r/GA7	r	c
Optics	<	A/y		>
SiO2	37.12	36.59	36.64	37.38
Al2O3	8.72	4.71	7.37	10.09
FeO(T)	17.91	22.35	19.76	16.31
MgO	0.00	0.00	0.00	0.00
CaO	34.64	34.16	34.19	34.71
Na2O	0.01	0.00	0.02	0.00
TiO2	0.29	0.16	0.20	0.20
MnO	0.28	0.29	0.38	0.32
Cr2O3	n.d.	n.d.	n.d.	n.d.
Sum	98.97	98.26	98.56	99.01

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	19.90	24.83	21.95	18.03
FeO(c)	0.00	0.00	0.00	0.00
Sum(Adj)	100.96	100.74	100.75	100.81
Si	2.97	2.99	2.96	2.97
Al	0.03	0.01	0.04	0.03
Z	3.00	3.00	3.00	3.00
Al	0.79	0.45	0.66	0.92
Fe+3	1.20	1.53	1.34	1.08
Ti	0.02	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00
Y	2.01	1.99	2.01	2.01
Fe+2	0.00	0.00	0.00	0.01
Mg	0.00	0.00	0.00	0.00
Ca	2.97	2.99	2.96	2.96
Mn	0.02	0.02	0.03	0.02
Na	0.00	0.00	0.00	0.00
X	2.99	3.01	2.99	2.99
Ad	59.79	76.47	66.44	53.86
Uv	0.00	0.00	0.00	0.00
Py	0.00	0.00	0.00	0.00
Al	0.00	0.00	0.00	0.18
Sp	0.63	0.67	0.86	0.72
Gr	39.58	22.86	32.70	45.24

85JH079 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA2	GA3-1	GA3-1'	GA3-2	GA3-3	GA3-4
Point					(2)					
Optics	<					A/c				>
SiO2	35.62	34.77	36.89	36.38	35.71	38.03	36.97	37.25	37.37	37.88
Al2O3	4.75	3.67	7.26	7.02	4.43	12.93	8.29	11.53	11.81	12.59
FeO(T)	21.06	21.18	18.30	20.05	22.32	13.48	18.43	14.67	14.52	13.62
MgO	0.21	0.20	0.21	0.22	0.28	0.19	0.17	0.18	0.18	0.19
CaO	33.78	33.36	33.86	33.57	33.06	35.01	34.63	35.24	34.98	34.84
Na2O	0.02	0.32	0.02	0.01	0.02	0.03	0.01	0.01	0.00	0.00
TiO2	1.12	1.95	2.23	1.70	2.24	0.18	0.11	0.18	0.14	0.13
MnO	0.29	0.24	0.32	0.44	0.56	0.56	0.33	0.45	0.50	0.53
Cr2O3	0.08	0.07	0.02	0.07	0.02	0.08	0.00	0.00	0.00	0.00
Sum	96.93	95.76	99.11	99.46	98.64	100.49	98.94	99.51	99.50	99.79
K2O	0.06	0.13	0.06	0.05	0.04	0.04	0.01	0.02	0.06	0.00
F	0.04	0.03	0.04	0.00	0.00	0.83	0.00	0.01	0.12	0.06
Cl	0.08	1.98	0.00	0.03	0.04	0.92	0.01	0.00	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	23.40	23.53	18.17	21.02	23.47	14.98	20.48	16.30	16.13	15.14
FeO(c)	0.00	0.00	1.94	1.13	1.20	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	99.27	98.11	100.93	101.56	100.98	101.99	100.99	101.14	101.11	101.30
Si	2.95	2.92	2.97	2.93	2.93	2.95	2.96	2.93	2.94	2.96
Al	0.05	0.08	0.03	0.07	0.07	0.05	0.04	0.07	0.06	0.04
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.42	0.29	0.66	0.59	0.35	1.13	0.74	1.00	1.03	1.12
Fe+3	1.46	1.49	1.10	1.27	1.45	0.87	1.23	0.97	0.95	0.89
Ti	0.07	0.12	0.14	0.10	0.14	0.01	0.01	0.01	0.01	0.01
Cr	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.95	1.90	1.90	1.97	1.94	2.03	1.98	1.98	2.00	2.02
Fe+2	0.00	0.00	0.13	0.08	0.08	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Ca	3.00	3.00	2.92	2.89	2.90	2.91	2.97	2.97	2.95	2.92
Mn	0.02	0.02	0.02	0.03	0.04	0.04	0.02	0.03	0.03	0.04
Na	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.10	3.10	3.03	3.06	2.97	3.02	3.02	3.00	2.98
Ad	73.33	75.89	56.30	64.03	73.34	43.45	61.32	47.71	47.25	44.31
Uv	0.26	0.24	0.07	0.22	0.07	0.24	0.00	0.00	0.00	0.00
Py	0.87	0.85	0.86	0.89	1.16	0.73	0.67	0.70	0.70	0.74
Al	0.00	0.00	4.47	2.56	2.78	0.00	0.00	0.00	0.00	0.00
Sp	0.68	0.58	0.75	1.01	1.32	1.22	0.74	0.99	1.10	1.17
Gr	24.85	22.44	37.56	31.29	21.35	54.36	37.26	50.60	50.95	53.79

B5JH079 Garnet analyses

Grain	GA3-5	GA3-6	GA3-7	GA3-8	GA3-9	GA3-10	GA4-1	GA4-2	GA5-1	GA5-2
Point					r	r	r/GA3-10	m	vr/0	vc
Optics	I/y	A/c	A/c	A/v	A/v	A/y	I/y	A/c	I/r	I/y
SiO2	35.02	37.19	36.82	36.66	37.29	35.53	35.34	37.05	34.62	35.13
Al2O3	0.01	10.43	9.93	5.39	10.24	5.18	0.00	10.55	0.01	0.00
FeO(T)	28.56	16.01	16.36	22.13	16.56	22.02	28.50	14.22	27.71	28.44
MgO	0.19	0.24	0.20	0.24	0.19	0.21	0.17	0.19	0.18	0.18
CaO	33.08	34.70	34.93	33.61	34.47	33.33	32.85	34.80	33.09	33.37
Na2O	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.01	0.01	0.01
TiO2	0.00	0.08	0.02	0.69	0.34	1.33	0.00	0.33	0.05	0.01
MnO	0.17	0.35	0.35	0.34	0.42	0.38	0.25	0.39	0.14	0.13
Cr2O3	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Sum	97.06	99.82	98.64	99.07	99.51	98.00	97.12	97.54	95.81	97.27
K2O	0.02	0.08	0.02	0.00	0.02	0.02	0.07	0.06	0.04	0.05
F	0.00	0.14	0.36	0.05	0.08	0.13	0.00	0.19	0.03	0.00
Cl	0.03	0.07	0.00	0.10	0.00	0.14	0.04	0.04	0.05	0.00
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	31.73	17.79	19.18	23.90	18.40	24.27	31.66	15.80	30.79	31.60
FeO(c)	0.00	0.00	0.00	0.62	0.00	0.17	0.00	0.00	0.00	0.00
Sum(Adj)	100.23	101.60	100.46	101.46	101.35	100.43	100.28	99.12	98.89	100.43
Si	2.96	2.93	2.94	2.97	2.95	2.92	2.98	2.98	2.96	2.96
Al	0.00	0.07	0.06	0.03	0.05	0.08	0.00	0.02	0.00	0.00
Z	2.96	3.00	3.00	3.00	3.00	3.00	2.98	3.00	2.96	2.96
Al	0.00	0.90	0.87	0.49	0.91	0.42	0.00	0.98	0.00	0.00
Fe+3	2.01	1.06	1.09	1.46	1.10	1.50	2.01	0.96	1.98	2.00
Ti	0.00	0.05	0.00	0.04	0.02	0.08	0.00	0.02	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.02	2.01	1.96	1.99	2.02	2.00	2.01	1.95	1.98	2.00
Fe+2	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.00
Mg	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02
Ca	2.99	2.93	2.99	2.92	2.92	2.93	2.97	3.00	3.03	3.01
Mn	0.01	0.02	0.02	0.02	0.03	0.03	0.02	0.03	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	2.99	3.04	3.01	2.98	3.00	3.01	3.05	3.06	3.04
Ad	98.79	52.68	53.92	73.09	54.52	75.04	98.71	47.76	98.13	98.95
Uv	0.03	0.00	0.03	0.03	0.00	0.03	0.00	0.00	0.00	0.00
Py	0.78	0.94	0.78	0.97	0.74	0.86	0.70	0.76	0.76	0.75
Al	0.00	0.00	0.00	1.41	0.00	0.39	0.00	0.00	0.00	0.00
Sp	0.40	0.78	0.76	0.78	0.94	0.88	0.59	0.89	0.34	0.31
Gr	0.00	45.60	44.48	23.72	43.80	22.80	0.00	50.59	0.78	0.00

85JH079 Garnet analyses

Grain	GA5-3	GA5-4	GA5-5	GA6-1	GA6-2	GA6-3	GA7-1	GA7-2	GA7-3	GA8-1
Point	vr	orange	vr/Q	vr/KF	vc	vr/Q	vc		r	
Optics	<	I/r	>	<			I/y			>
SiO2	34.88	35.69	36.63	35.30	35.32	35.68	35.22	35.30	36.54	35.72
Al2O3	0.00	2.88	5.79	0.08	0.00	0.00	0.00	0.00	5.06	3.97
FeO(T)	28.29	25.35	21.07	28.37	27.63	28.17	28.67	28.01	21.16	21.50
MgO	0.16	0.19	0.15	0.20	0.21	0.18	0.15	0.18	0.20	0.24
CaO	33.25	33.37	33.65	32.86	33.31	33.39	32.93	32.88	33.43	32.97
Na2O	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.01
TiO2	0.01	0.00	0.10	0.02	0.02	0.00	0.01	0.00	0.04	1.10
MnO	0.12	0.21	0.41	0.45	0.18	0.11	0.36	0.20	0.43	0.34
Cr2O3	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.04
Sum	96.72	97.68	97.81	97.28	96.68	97.53	97.34	96.57	96.90	95.89
K2O	0.00	0.07	0.00	0.05	0.03	0.03	0.00	0.00	0.09	0.07
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.32
Cl	0.06	0.04	0.00	0.04	0.07	0.00	0.00	0.02	0.04	0.38
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	31.43	28.16	23.36	31.52	30.70	31.30	31.85	31.12	23.50	23.18
FeO(c)	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.64
Sum(Adj)	99.86	100.49	100.14	100.43	99.75	100.66	100.52	99.68	99.25	98.21
Si	2.95	2.96	3.00	2.97	2.99	2.99	2.97	2.99	3.02	3.00
Al	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Z	2.95	3.00	3.00	2.98	2.99	2.99	2.97	2.99	3.02	3.00
Al	0.00	0.24	0.55	0.02	0.00	0.00	0.00	0.00	0.50	0.39
Fe+3	2.00	1.76	1.44	2.00	1.95	1.98	2.02	1.98	1.46	1.47
Ti	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.00	2.00	2.00	2.00	1.96	1.98	2.02	1.98	1.96	1.93
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Mg	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.03
Ca	3.02	2.96	2.95	2.96	3.02	3.00	2.97	2.99	2.96	2.97
Mn	0.01	0.01	0.03	0.03	0.01	0.01	0.03	0.01	0.03	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.00	3.00	3.02	3.06	3.03	3.02	3.02	3.02	3.07
Ad	99.05	87.16	71.97	98.12	97.44	98.64	98.55	98.77	73.49	74.34
Uv	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.13
Py	0.67	0.74	0.61	0.82	0.88	0.75	0.61	0.76	0.83	1.02
Al	0.00	0.00	2.11	0.00	0.00	0.00	0.00	0.00	0.03	1.52
Sp	0.28	0.49	0.95	1.05	0.43	0.26	0.84	0.48	1.01	0.82
Gr	0.00	11.62	26.36	0.00	1.21	0.35	0.00	0.00	24.65	22.16

B5JH280 Garnet analyses

Grain	GA1	GA2-1	GA2-2	GA3-1	GA3-2	GA3-3	GA4-1	GA4-2	GA5-1	GA5-2
Point	(2)	r/KF(2)	c(2)	vr/KF		vr/KF	r/KF		r/CC	c
Optics	A/c	A/c	I/c	< fine-scale zoning of A and I bands/color obscure, tends to red or amber>						
SiO2	36.18	36.63	35.50	36.32	36.88	36.55	38.13	38.65	36.38	37.11
Al2O3	5.87	7.65	0.10	7.71	6.69	9.22	19.25	18.65	7.41	11.45
FeO(T)	28.94	18.11	28.03	18.26	19.19	14.58	3.86	5.16	19.05	13.44
MgO	0.06	0.03	0.00	0.05	0.08	0.05	0.06	0.04	0.05	0.00
CaO	33.80	34.48	33.18	34.72	34.44	35.59	36.78	36.59	34.66	35.77
Na2O	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.01
TiO2	0.70	0.98	0.00	0.89	0.89	1.28	0.68	0.72	0.95	1.03
MnO	0.25	0.35	0.21	0.32	0.42	0.28	0.69	0.49	0.45	0.26
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.80	98.23	97.02	98.28	98.60	97.48	99.45	100.30	98.95	99.07
K2O	n.d.	n.d.	n.d.	0.02	0.02	0.03	0.11	0.04	0.00	0.01
F	n.d.	n.d.	n.d.	0.05	0.01	0.38	0.75	0.63	0.00	0.31
Cl	n.d.	n.d.	n.d.	0.01	0.00	0.00	0.00	0.00	0.00	0.04
SO3	n.d.	n.d.	n.d.	0.00	0.00	0.00	0.00	0.09	0.05	0.08
Formula basis = 5 cations										
Fe2O3(c)	27.01	20.01	31.14	20.29	21.18	16.11	4.29	5.73	21.16	14.93
FeO(c)	0.23	0.10	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.10	100.23	100.13	100.31	100.72	99.09	99.88	100.87	101.06	100.56
Si	2.96	2.97	3.00	2.94	2.98	2.95	2.91	2.94	2.93	2.93
Al	0.04	0.03	0.00	0.06	0.02	0.05	0.09	0.06	0.07	0.07
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.53	0.70	0.01	0.67	0.62	0.83	1.65	1.61	0.63	1.00
Fe+3	1.42	1.22	1.98	1.23	1.29	0.98	0.25	0.33	1.28	0.89
Ti	0.04	0.06	0.00	0.05	0.05	0.08	0.04	0.04	0.06	0.06
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.99	1.97	1.98	1.96	1.97	1.89	1.94	1.98	1.97	1.95
Fe+2	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.00
Ca	2.97	2.99	3.00	3.01	2.99	3.08	3.01	2.98	2.99	3.03
Mn	0.02	0.02	0.02	0.02	0.03	0.02	0.04	0.03	0.03	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.01	3.03	3.02	3.04	3.03	3.11	3.06	3.02	3.03	3.05
Ad	71.06	61.29	98.83	61.65	65.03	49.33	12.22	16.35	63.96	44.39
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.25	0.12	0.00	0.20	0.32	0.20	0.23	0.15	0.20	0.00
Al	0.52	0.22	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00
Sp	0.58	0.81	0.50	0.73	0.97	0.64	1.48	1.05	1.02	0.58
Gr	27.60	37.56	0.67	37.41	33.42	49.82	86.07	82.45	34.82	55.03

85JH086 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA2-3	GA3
Point	r/GA2	c	r/GA1	c		(2)[8]
Optics	‹			I/r		›
SiO2	36.44	36.30	34.80	35.02	34.92	34.89
Al2O3	7.27	10.20	0.51	0.08	0.08	0.08
FeO(T)	18.45	15.08	26.66	27.22	27.15	27.09
MgO	0.05	0.02	0.00	0.00	0.00	0.00
CaO	34.51	34.68	33.36	33.46	33.48	33.22
Na2O	0.00	0.00	0.00	0.01	0.01	0.01
TiO2	0.35	1.16	0.00	0.01	0.00	0.00
MnO	0.25	0.26	0.12	0.12	0.16	0.26
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	8.46	8.36	8.73	8.74	8.74	8.74
F	0.06	0.25	0.13	0.06	0.12	0.08
Cl	0.02	0.10	0.05	0.00	0.01	0.04
SO3	0.08	0.14	0.05	0.00	0.14	0.00
Formula basis = 8 cations, 12 oxygens						
Fe2O3(c)	20.50	16.75	29.62	30.24	30.16	30.10
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	99.37	99.46	98.41	98.94	98.81	98.56
Si	2.98	2.92	2.98	2.99	2.98	2.99
Al	0.02	0.08	0.02	0.01	0.01	0.01
Z	3.00	3.00	3.00	3.00	2.99	3.00
Al	0.68	0.90	0.03	0.00	0.00	0.00
Fe+3	1.26	1.02	1.91	1.94	1.94	1.94
Ti	0.02	0.07	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.96	1.99	1.94	1.94	1.94	1.94
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.00	0.00	0.00	0.00
Ca	3.02	2.99	3.06	3.06	3.06	3.05
Mn	0.02	0.02	0.01	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.01	3.07	3.07	3.07	3.07
Ad	62.95	50.72	94.87	96.75	96.51	96.69
Uv	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.20	0.08	0.00	0.00	0.00	0.00
Al	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.58	0.59	0.29	0.29	0.38	0.63
Gr	36.27	48.61	4.84	2.96	3.11	2.68

85JH087 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA2-1	GA2-2
Point				c	r
Optics	‹		I/r		›
SiO2	35.31	35.39	35.24	35.43	35.99
Al2O3	0.23	0.38	0.07	0.18	5.99
FeO(T)	27.00	27.17	27.39	27.31	19.24
MgO	0.04	0.00	0.00	0.02	0.06
CaO	33.18	33.37	33.39	33.01	34.08
Na2O	0.00	0.00	0.00	0.00	0.02
TiO2	0.01	0.00	0.00	0.03	1.00
MnO	0.11	0.12	0.10	0.14	0.27
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	95.88	96.43	96.19	96.12	96.65
F	0.09	0.12	0.10	0.11	0.08
Cl	0.01	0.09	0.07	0.00	0.00
SO3	0.00	0.16	0.00	0.19	0.00
Formula basis = 8 cations, 12 oxygens					
Fe2O3(c)	30.00	30.19	30.43	30.34	21.38
FeO(c)	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	98.88	99.45	99.23	99.15	98.79
Si	3.01	3.00	3.00	3.01	2.98
Al	0.00	0.00	0.00	0.00	0.02
Z	3.01	3.00	3.00	3.01	3.00
Al	0.02	0.04	0.00	0.02	0.56
Fe+3	1.92	1.92	1.95	1.94	1.33
Ti	0.00	0.00	0.00	0.00	0.06
Cr	0.00	0.00	0.00	0.00	0.00
Y	1.94	1.96	1.95	1.96	1.95
Fe+2	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.00	0.00	0.01
Ca	3.03	3.03	3.04	3.01	3.02
Mn	0.01	0.01	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00
X	3.05	3.04	3.05	3.02	3.05
Ad	96.39	96.22	97.29	97.47	67.04
Uv	0.00	0.00	0.00	0.00	0.00
Py	0.17	0.00	0.00	0.02	0.25
Al	2.00	0.00	0.00	0.00	0.00
Sp	0.27	0.29	0.24	0.34	0.64
Gr	3.18	3.49	2.47	2.11	32.07

85JH088 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA2
Point	c(2)	oc	r	(2)
Optics	<	I/r		>
SiO2	35.17	34.86	35.36	34.61
Al2O3	0.15	0.11	2.47	0.12
FeO(T)	26.97	27.28	23.29	26.81
MgO	0.00	0.04	0.00	0.02
CaO	33.26	33.10	33.67	33.15
Na2O	0.00	0.00	0.00	0.00
TiO2	0.00	0.01	0.00	0.01
MnO	0.21	0.18	0.19	0.27
Cr2O3	n.d.	n.d.	n.d.	n.d.
Sum	95.76	95.58	94.98	94.99
K2O	0.03	0.03	0.00	0.02
F	0.00	0.00	0.00	0.02
Cl	0.00	0.07	0.00	0.00
SO3	0.20	0.00	0.09	0.07
Formula basis = 8 cations, 12 oxygens				
Fe2O3(c)	29.96	30.31	25.88	29.79
FeO(c)	0.00	0.00	0.00	0.00
Sum(Adj)	98.75	98.61	97.57	97.97
Si	3.00	2.98	3.01	2.98
Al	0.00	0.01	0.00	0.01
Z	3.00	2.99	3.01	2.99
Al	0.02	0.00	0.25	0.00
Fe+3	1.92	1.95	1.66	1.93
Ti	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00
Y	1.94	1.95	1.91	1.93
Fe+2	0.00	0.00	0.00	0.00
Mg	0.00	0.01	0.00	0.00
Ca	3.04	3.04	3.07	3.06
Mn	0.02	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00
X	3.06	3.06	3.08	3.08
Ad	96.29	97.28	83.04	96.06
Uv	0.00	0.00	0.00	0.00
Py	0.00	0.17	0.00	0.09
Al	0.00	0.00	0.00	0.00
Sp	0.51	0.43	0.46	0.65
Gr	3.20	2.12	16.50	3.20

Skarn D samples

CB traverse	other samples
76CB2[1] (N end)	85JH107
76CB3	85JH112
76CB4	85JH113
76CB5	85JH114
76CB6	85JH125
76CB7[2]	85JH126
76CB8	85JH127
76CB9	85JH129[3]
76CB10[4]	
76CB11 (S end in Contention Pit)	

[1] Three sections studied for two samples, 76CB2 and 76CB2C; FI slides were subsequently used by Theodore for fluid inclusion studies; FI slides are thicker than others therefore colors and anisotropism may not be accurate

[2] Two samples studied: a and b

[3] Sample represents a loose block of mineralized skarn from the Contention Pit

[4] Three samples studied: a,b,c

76CB2 (FI section) Garnet analyses

Grain	GA1	GA2	GA3	GA4-1	GA4-2	GA4-3	GA4-4
Point	c	c	c	r	r	ir	oc
Optics	A/c	A/c	A/c	A/c	A/c	A/c	I/y
	(GA1,2,3 = early)			(GA4 = late)			
SiO2	36.39	36.34	36.73	36.73	37.27	36.77	35.34
Al2O3	5.83	6.21	5.45	6.34	7.57	7.12	0.06
FeO(T)	21.63	21.38	22.25	21.48	19.96	20.35	29.23
MgO	0.04	0.07	0.03	0.06	0.03	0.06	0.09
CaO	34.35	34.52	34.64	34.48	35.30	34.79	33.87
Na2O	0.02	0.02	0.02	0.01	0.01	0.01	0.00
TiO2	0.16	0.11	0.03	0.05	0.12	0.23	0.02
MnO	0.21	0.27	0.16	0.23	0.21	0.25	0.19
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.63	98.92	99.31	99.38	100.47	99.58	98.80

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	24.03	23.75	24.72	23.86	22.18	22.61	32.47
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.03	101.29	101.78	101.76	102.69	101.84	102.04
Si	2.95	2.94	2.96	2.95	2.95	2.94	2.93
Al	0.05	0.06	0.04	0.05	0.05	0.06	0.01
Z	3.00	3.00	3.00	3.00	3.00	3.00	2.94
Al	0.51	0.53	0.48	0.56	0.66	0.61	0.00
Fe+3	1.47	1.44	1.50	1.44	1.32	1.36	2.03
Ti	0.01	0.01	0.00	0.00	0.01	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.99	1.98	1.99	2.00	1.99	1.99	2.03
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.01	0.00	0.01	0.00	0.01	0.01
Ca	2.99	2.99	3.00	2.97	2.99	2.98	3.01
Mn	0.01	0.02	0.01	0.02	0.01	0.02	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.01	3.02	3.01	3.00	3.01	3.01	3.03
Ad	72.92	71.48	74.62	71.65	65.54	67.53	99.20
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.16	0.28	0.12	0.24	0.12	0.24	0.36
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.48	0.61	0.36	0.52	0.47	0.56	0.44
Gr	26.44	27.63	24.90	27.59	33.88	31.67	0.00

76CB2 (FI section) Garnet analyses

Grain	GA5-1	GA5-2	GA5-3	GA5-4	GA5-5	GA5-6	GA5-7	GA5-8	GA5-9	GA5-10
Point	0 r	20	40	60	80	100	120	140	160	180
Optics	<					I/y				>
		(GA5 = late)								
SiO2	35.50	35.18	35.08	35.17	35.12	35.50	35.34	35.23	35.55	35.27
Al2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FeO(T)	28.91	29.13	29.02	29.14	28.96	29.12	29.19	29.44	29.20	29.61
MgO	0.04	0.04	0.05	0.05	0.03	0.04	0.04	0.04	0.06	0.01
CaO	33.93	33.82	33.71	33.83	33.67	33.84	33.98	33.73	33.82	33.84
Na2O	0.00	0.01	0.02	0.00	0.02	0.00	0.01	0.01	0.02	0.00
TiO2	0.02	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.02	0.03
MnO	0.15	0.11	0.11	0.16	0.09	0.10	0.09	0.14	0.12	0.12
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.55	98.29	98.00	98.37	97.89	98.60	98.65	98.59	98.79	98.88

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	32.12	32.36	32.24	32.37	32.17	32.35	32.43	32.71	32.44	32.90
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.76	101.52	101.22	101.60	101.10	101.83	101.89	101.86	102.03	102.17
Si	2.95	2.93	2.93	2.93	2.94	2.95	2.94	2.93	2.95	2.93
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z	2.95	2.93	2.93	2.93	2.94	2.95	2.94	2.93	2.95	2.93
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe+3	2.01	2.03	2.03	2.03	2.03	2.02	2.03	2.05	2.03	2.05
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.01	2.03	2.03	2.03	2.03	2.02	2.03	2.05	2.03	2.06
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00
Ca	3.02	3.02	3.02	3.02	3.02	3.01	3.02	3.01	3.01	3.01
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.04	3.04	3.04	3.04	3.03	3.03	3.04	3.02	3.02	3.02
Ad	99.49	99.58	99.54	99.43	99.67	99.61	99.63	99.52	99.48	99.69
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.16	0.16	0.20	0.20	0.12	0.16	0.16	0.16	0.24	0.04
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.35	0.25	0.26	0.37	0.21	0.23	0.21	0.32	0.28	0.27
Gr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

76CB2 (FI section) Garnet analyses

Grain	GA5-11	GA5-12	GA5-13	GA5-14	GA5-15	GA5-16	GA5-17	GA5-18	GA5-19	GA5-20
Point	200	220	240	260	280	300	320	340	360	440
Optics	I/y	boundary	<	zoned area/c	>	boundary	<	zoned area/oy		>
SiO2	35.40	35.76	37.41	37.18	36.95	37.47	36.80	37.32	36.22	36.00
Al2O3	0.00	3.43	9.33	8.46	9.03	9.14	7.28	8.80	7.96	5.24
FeO(T)	29.07	24.27	17.08	18.05	17.34	16.58	19.49	17.93	18.46	22.94
MgO	0.02	0.04	0.06	0.05	0.06	0.05	0.07	0.06	0.06	0.05
CaO	33.73	34.53	35.61	35.12	35.56	35.80	35.08	34.56	34.82	34.34
Na2O	0.01	0.01	0.02	0.01	0.02	0.02	0.00	0.02	0.01	0.01
TiO2	0.00	0.06	0.07	0.03	0.04	0.03	0.03	0.19	0.17	0.08
MnO	0.14	0.15	0.18	0.15	0.25	0.20	0.19	0.34	0.31	0.24
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.37	98.25	99.76	99.05	99.25	99.29	98.94	99.22	98.81	98.90

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	32.30	26.96	18.98	20.05	19.26	18.42	21.65	19.92	20.51	25.49
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.60	100.94	101.66	101.05	101.17	101.13	101.10	101.21	100.06	101.45
Si	2.95	2.94	2.96	2.97	2.94	2.97	2.96	2.98	2.93	2.92
Al	0.00	0.06	0.04	0.03	0.06	0.03	0.04	0.02	0.07	0.08
Z	2.95	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.00	0.27	0.83	0.77	0.79	0.83	0.65	0.81	0.69	0.43
Fe+3	2.03	1.67	1.13	1.21	1.15	1.10	1.31	1.20	1.25	1.56
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.03	1.94	1.96	1.98	1.94	1.93	1.96	2.01	1.95	1.99
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ca	3.01	3.04	3.02	3.01	3.03	3.05	3.02	2.95	3.02	2.99
Mn	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.06	3.04	3.02	3.06	3.07	3.04	2.99	3.05	3.01
Ad	99.59	82.46	56.06	59.98	57.03	54.80	64.94	59.70	61.76	76.80
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.08	0.16	0.23	0.20	0.23	0.20	0.28	0.24	0.24	0.20
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.32	0.34	0.40	0.34	0.56	0.45	0.43	0.77	0.70	0.54
Gr	0.00	17.04	43.30	39.48	42.17	44.56	34.35	39.29	37.30	22.45

76CB2 (FI section) Garnet analyses

Grain	GA5-21	GA5-22	GA5-23	GA5-24	GA6-1	GA6-2
Point	488	588	1494	2756c	c (3)	r (3)
Optics	< zoned area/o		>	I/o	A/c	A/c
					(GA6 = early)	
SiO2	34.93	35.14	35.14	34.79	36.48	37.14
Al2O3	0.00	0.00	0.00	0.00	8.40	7.72
FeO(T)	28.70	29.00	28.73	28.83	17.01	19.53
MgO	0.05	0.04	0.07	0.02	0.13	0.04
CaO	33.41	33.33	33.45	33.58	35.32	35.16
Na2O	0.01	0.00	0.02	0.00	0.01	0.02
TiO2	0.00	0.00	0.01	0.00	2.14	0.00
MnO	0.16	0.14	0.15	0.13	0.27	0.17
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.26	97.65	97.57	97.35	99.76	99.78

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	31.89	32.22	31.92	32.03	18.90	21.70
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.45	100.87	100.76	100.55	101.65	101.95
Si	2.94	2.95	2.95	2.93	2.90	2.96
Al	0.00	0.00	0.00	0.00	0.10	0.04
Z	2.94	2.95	2.95	2.93	3.00	3.00
Al	0.00	0.00	0.00	0.00	0.69	0.68
Fe+3	2.02	2.04	2.02	2.03	1.13	1.30
Ti	0.00	0.00	0.00	0.00	0.13	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.02	2.04	2.02	2.03	1.95	1.98
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.01	0.01	0.00	0.02	0.00
Ca	3.02	3.00	3.01	3.03	3.01	3.00
Mn	0.01	0.01	0.01	0.01	0.02	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00
X	3.04	3.01	3.03	3.04	3.05	3.02
Ad	99.42	99.51	99.36	99.61	56.98	64.48
Uv	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.21	0.16	0.29	0.08	0.52	0.16
Al	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.38	0.33	0.35	0.30	0.61	0.38
Gr	0.00	0.00	0.00	0.00	41.89	34.98

76CB2C (FI section) Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA1-6	GA1-7	GA1-8	GA1-9	GA1-10
Point	0	200	400	600	800	1000	1200	1400	1600	1800
	Traverse perpendicular to growth zones across a large, late crystal									
SiO2	36.73	35.72	35.65	35.93	36.68	35.58	35.46	35.21	35.32	35.17
Al2O3	5.73	0.58	1.92	4.17	6.21	0.39	0.52	0.07	0.13	0.02
FeO(T)	22.02	27.53	25.90	23.23	21.00	27.94	28.13	28.21	28.11	28.24
MgO	0.19	0.29	0.22	0.20	0.22	0.27	0.26	0.25	0.22	0.26
CaO	33.51	32.91	33.49	33.41	33.97	32.90	32.82	32.97	33.10	32.92
Na2O	0.02	0.00	0.01	0.02	0.02	0.00	0.01	0.02	0.01	0.01
TiO2	0.02	0.02	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
MnO	0.24	0.10	0.14	0.15	0.20	0.13	0.13	0.14	0.12	0.17
Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Sum	98.46	97.15	97.33	97.11	98.42	97.21	97.33	96.88	97.01	96.79
K2O	0.04	0.02	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	24.10	30.59	28.77	25.81	23.33	31.04	31.25	31.34	31.23	31.37
FeO(c)	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.87	100.21	100.20	99.69	100.75	100.31	100.45	100.01	100.13	99.92
Si	2.99	3.00	2.97	2.98	2.98	2.99	2.98	2.97	2.98	2.97
Al	0.01	0.00	0.03	0.02	0.02	0.01	0.02	0.01	0.01	0.00
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.98	2.99	2.98
Al	0.54	0.06	0.16	0.39	0.57	0.03	0.03	0.00	0.00	0.00
Fe+3	1.48	1.93	1.81	1.61	1.42	1.96	1.97	1.99	1.98	2.00
Ti	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.01	1.99	1.97	1.99	2.00	1.99	2.00	1.99	1.98	2.00
Fe+2	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.04	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03
Ca	2.92	2.96	2.99	2.97	2.95	2.96	2.95	2.98	2.99	2.98
Mn	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.99	3.01	3.03	3.01	3.00	3.01	3.00	3.03	3.03	3.03
Ad	73.67	96.74	89.85	80.17	71.05	98.01	98.33	98.60	98.66	98.52
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Py	0.77	1.21	0.91	0.82	0.89	1.13	1.08	1.04	0.92	1.08
Al	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.55	0.24	0.33	0.35	0.46	0.31	0.31	0.33	0.29	0.40
Gr	24.27	1.81	8.91	18.65	27.60	0.55	0.28	0.00	0.13	0.00

76CB20 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA3-1	GA3-2	GA4-1	GA4-2	GA4-3	GA4-4
Point	r (3)	c (3)	r (2)	c (2)	r (2)	c (2)	r	m	m	m
Optics	A/c	A/c	A/c	A/c	A/c	I/y	A/c	A/c	A/c	A/c
SiO2	36.18	35.79	36.54	36.44	36.38	34.72	36.33	36.74	36.46	36.38
Al2O3	7.86	4.93	6.80	4.67	5.64	0.26	7.60	8.02	8.15	5.74
FeO(T)	19.24	22.76	20.94	22.81	22.16	28.52	19.70	19.22	19.24	22.33
MgO	0.21	0.27	0.20	0.34	0.22	0.35	0.19	0.19	0.20	0.21
CaO	34.93	34.33	35.11	34.28	34.22	33.52	34.75	35.22	34.79	34.53
Na2O	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
TiO2	0.02	0.17	0.07	0.24	0.00	0.00	0.02	0.01	0.03	0.05
MnO	0.17	0.21	0.20	0.25	0.16	0.17	0.20	0.24	0.24	0.18
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.61	98.46	99.86	99.03	98.79	97.54	98.80	99.64	99.11	99.42

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	21.38	25.29	23.26	25.34	24.62	31.69	21.89	21.35	21.38	24.81
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.75	100.99	102.18	101.56	101.25	100.71	100.99	101.77	101.25	101.90
Si	2.91	2.92	2.92	2.96	2.95	2.91	2.92	2.92	2.92	2.93
Al	0.09	0.08	0.08	0.04	0.05	0.03	0.08	0.08	0.08	0.07
Z	3.00	3.00	3.00	3.00	3.00	2.94	3.00	3.00	3.00	3.00
Al	0.66	0.39	0.56	0.40	0.49	0.00	0.64	0.68	0.69	0.48
Fe+3	1.29	1.55	1.40	1.55	1.50	2.02	1.32	1.28	1.29	1.50
Ti	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.95	1.95	1.96	1.96	1.99	2.00	1.97	1.96	1.98	1.98
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.03	0.02	0.04	0.03	0.04	0.02	0.02	0.02	0.03
Ca	3.01	3.00	3.00	2.98	2.97	3.01	2.99	3.00	2.98	2.98
Mn	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.05	3.04	3.04	3.01	3.07	3.01	3.04	3.02	3.01
Ad	67.59	76.48	68.80	76.87	74.34	98.15	65.04	63.82	63.36	74.20
Uv	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.87	1.25	0.79	1.36	0.88	1.43	0.75	0.74	0.78	0.83
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.38	0.49	0.44	0.57	0.36	0.40	0.45	0.53	0.53	0.40
Gr	31.20	21.97	29.97	21.20	24.42	0.02	33.57	35.71	35.32	24.56

76CB2C Garnet analyses

Grain	GA4-5	GA4-6	GA4-7	GA4-8	GA4-9	GA5-1	GA5-2	GA5-3	GA6-1	GA6-2
Point	m	m	m	m	c	c	r	r	c	r
Optics	A/c	I/v	I/v	I/v	I/v	A/c	A/c	A/c	I	I
SiO2	36.48	34.28	34.53	34.38	34.28	36.03	37.00	35.50	35.42	34.62
Al2O3	6.23	0.07	0.14	0.61	0.08	8.26	8.75	6.34	2.62	0.69
FeO(T)	21.59	29.19	29.01	28.39	29.13	19.13	18.22	21.28	25.60	28.51
MgO	0.19	0.21	0.24	0.23	0.20	0.22	0.22	0.18	0.25	0.21
CaO	34.76	33.54	33.35	33.81	33.56	33.92	35.23	34.81	33.57	33.49
Na2O	0.00	0.02	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.03
TiO2	0.00	0.01	0.02	0.01	0.01	0.34	0.03	0.05	0.43	0.02
MnO	0.20	0.16	0.14	0.18	0.14	0.26	0.19	0.19	0.20	0.18
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	99.45	97.44	97.43	97.62	97.40	98.16	99.66	98.36	98.09	97.75

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	23.99	32.43	32.23	31.54	32.36	21.25	20.24	23.64	28.44	31.67
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.85	100.68	100.45	100.77	100.63	100.28	101.68	100.72	100.93	100.91
Si	2.93	2.98	2.98	2.98	2.98	2.91	2.94	2.98	2.93	2.89
Al	0.07	0.00	0.01	0.06	0.01	0.09	0.06	0.12	0.07	0.07
Z	3.00	2.99	2.92	2.94	2.99	3.00	3.00	3.00	3.00	2.96
Al	0.52	0.00	0.02	0.00	0.00	0.70	0.75	0.49	0.18	0.00
Fe+3	1.45	2.05	2.04	1.99	2.05	1.29	1.21	1.44	1.77	1.99
Ti	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.97	2.05	2.04	1.99	2.05	2.02	1.96	1.94	1.98	1.99
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03
Ca	2.99	3.02	3.00	3.03	3.02	2.94	2.99	3.03	2.97	3.00
Mn	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.06	3.04	3.08	3.06	2.98	3.04	3.06	3.02	3.04
Ad	71.52	98.79	98.71	97.00	98.87	63.85	59.70	70.61	87.71	97.69
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.75	0.85	0.97	0.94	0.81	0.87	0.86	0.71	1.02	0.86
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.45	0.37	0.32	0.42	0.32	0.59	0.42	0.43	0.46	0.42
Gr	27.28	0.00	0.00	1.65	0.00	34.69	39.02	28.25	10.80	1.04

76CB3 Garnet analyses

Grain	GA1-1	GA2-1	GA2-2	GA2-3	GA2-4	GA3-1	GA3-2	GA4-1	GA4-1'	GA4-2
Point	r/EP1	r	r	c	c			r	r	ir(2)
Datics	<		A/c		>	A/c	A/v	<	A/c	>
SiO2	37.36	36.34	36.54	37.04	36.91	38.77	36.37	36.19	36.61	37.08
Al2O3	10.62	8.96	7.86	10.45	10.27	17.05	6.46	7.36	8.05	11.62
FeO(T)	15.88	17.40	18.84	16.32	15.52	6.90	19.74	19.46	18.25	14.30
MgO	0.21	0.19	0.23	0.20	0.21	0.53	0.45	0.23	0.23	0.21
CaO	34.67	34.49	34.64	34.77	34.69	35.95	34.82	34.83	35.24	35.15
Na2O	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01
TiO2	0.81	0.30	0.19	0.45	0.90	0.55	1.35	0.57	0.71	0.63
MnO	0.31	0.24	0.23	0.35	0.28	0.10	0.16	0.15	0.16	0.30
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	99.88	97.92	98.53	99.58	98.78	99.87	99.35	98.79	99.25	99.30

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	17.42	19.33	20.93	18.13	17.24	7.67	21.93	21.62	20.28	15.89
FeO(c)	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.62	99.85	100.62	101.39	100.50	100.64	101.54	100.95	101.28	100.89
Si	2.94	2.93	2.94	2.93	2.94	2.97	2.92	2.91	2.92	2.92
Al	0.06	0.07	0.06	0.07	0.06	0.03	0.08	0.09	0.08	0.08
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.93	0.79	0.69	0.90	0.91	1.51	0.53	0.61	0.68	1.00
Fe+3	1.03	1.17	1.27	1.08	1.03	0.44	1.33	1.31	1.22	0.94
Ti	0.05	0.02	0.01	0.03	0.05	0.03	0.08	0.03	0.04	0.04
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.01	1.98	1.97	2.01	1.99	1.98	1.94	1.96	1.94	1.98
Fe+2	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.02	0.03	0.02	0.02	0.06	0.05	0.03	0.03	0.02
Ca	2.93	2.98	2.99	2.95	2.96	2.95	3.00	3.00	3.02	2.97
Mn	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.99	3.02	3.03	2.99	3.01	3.02	3.06	3.04	3.06	3.02
Ad	51.61	58.14	62.83	53.45	51.65	22.10	66.30	64.83	60.56	46.79
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.82	0.76	0.91	0.78	0.63	2.02	1.82	0.91	0.91	0.82
Al	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.69	0.54	0.52	0.78	0.63	0.22	0.36	0.34	0.36	0.66
Gr	46.44	40.56	35.73	44.99	46.89	75.66	31.54	33.92	38.17	51.73

76CBC Garnet analyses

Grain	GA4-1	GA4-4	GA5-1	GA5-2	GA6-1	GA6-2	GA7	GA8-1	GA8-2	GA8-3
Point	c	c	r	c	r	c	c(2)	/CR		
Optics	IA/c	IA/c	A/\	A/v	I/c	I/c	I/c	A'g	A/c	A/c
SiO2	36.05	35.66	37.42	36.88	34.74	34.74	35.37	37.34	38.26	37.76
Al2O3	7.87	7.38	12.51	12.16	0.25	0.04	0.05	15.48	15.68	15.06
FeO(T)	19.38	19.81	13.14	13.26	28.49	28.92	28.27	5.18	8.46	7.52
MgO	0.25	0.17	0.21	0.19	0.27	0.32	0.26	0.25	0.39	0.43
CaO	34.68	35.11	35.67	35.10	34.19	33.29	37.66	35.72	33.65	35.22
Na2O	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.01	0.02	0.01
TiO2	0.80	0.59	0.43	0.81	0.00	0.00	0.01	0.01	0.07	0.67
MnO	0.24	0.25	0.34	0.41	0.05	0.11	0.10	0.23	0.07	0.13
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44	0.00	0.19
Sum	99.44	99.17	99.74	99.81	99.03	97.47	97.44	98.46	96.60	98.01

Formula basis 8 cations 12 oxygens

Fe2O3(c)	21.57	21.7	14.60	14.75	31.65	32.13	31.41	5.75	9.40	7.92
FeO(c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48
Sum(Adj)	100.69	100.23	101.20	100.28	101.17	100.63	100.58	99.03	99.54	98.79
Si	2.92	2.89	2.93	2.92	2.98	2.92	2.94	2.93	2.96	2.97
Al	0.08	0.11	0.07	0.08	0.02	0.00	0.00	0.07	0.02	0.03
Z	3.00	3.00	3.00	3.00	2.92	2.92	2.95	3.00	3.00	3.00
Al	0.59	0.59	1.08	1.05	0.00	0.00	0.00	1.36	1.42	1.37
Fe+3	1.31	1.29	0.86	0.88	1.99	2.03	1.98	0.34	0.55	0.46
Ti	0.05	0.04	0.03	0.05	0.00	0.00	0.00	0.01	0.00	0.10
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.02	0.01
Y	1.95	1.91	1.96	1.98	1.99	2.03	1.98	1.99	1.97	1.94
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Mg	0.03	0.03	0.02	0.02	0.03	0.04	0.04	0.03	0.05	0.05
Ca	3.00	3.05	2.99	2.97	3.05	3.00	3.03	2.97	2.97	2.97
Mn	0.02	0.02	0.02	0.03	0.00	0.01	0.01	0.02	0.00	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.09	3.04	3.02	3.09	3.05	3.07	3.01	3.03	3.06
Ad	65.10	63.41	42.54	43.54	97.30	98.45	98.05	16.79	27.46	23.45
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.60	0.00	0.60
Py	1.00	0.87	0.81	0.74	1.10	1.30	1.16	0.96	1.51	1.71
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08
Sp	0.55	0.56	0.75	0.91	0.14	0.25	0.23	0.50	0.15	0.41
Gr	33.36	35.15	55.90	54.81	1.46	0.00	0.56	68.14	70.88	72.76

76CB3 Garnet analyses

Grain	GA9-1	GA9-2	GA10-1	GA10-2	GA11-1	GA11-2	GA11-3	GA11-4	GA11-5	GA11-6
Point	r	c	r	c	/CR				/CR	
Optics	A/c	I/c	A/c	I/c	A/c	A/c	A/v	A/v	A	A
SiO2	36.77	35.81	36.52	35.34	37.11	37.60	37.29	37.59	37.38	37.38
Al2O3	7.21	1.34	7.44	1.18	13.79	13.32	7.74	7.97	13.90	13.84
FeO(T)	20.56	27.03	19.33	27.60	9.73	9.67	18.18	17.53	6.32	8.64
MgO	0.29	0.32	0.28	0.27	0.58	0.71	0.26	0.30	0.73	0.72
CaO	34.87	33.87	34.56	33.38	35.22	35.17	34.13	34.34	35.12	35.60
Na2O	0.00	0.00	0.02	0.01	0.00	0.01	0.00	0.00	0.01	0.01
TiO2	0.04	0.02	0.34	0.02	1.38	2.44	0.93	1.19	3.06	2.74
MnO	0.26	0.08	0.22	0.09	0.04	0.06	0.27	0.12	0.07	0.08
Cr2O3	n.a.	n.d.	n.d.	n.d.	0.35	0.05	0.03	0.08	2.07	0.57
Sum	99.96	98.47	98.71	97.89	98.20	99.03	98.83	99.12	98.66	99.58

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	22.84	30.03	21.48	30.66	10.81	9.94	19.13	17.96	5.87	9.45
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.72	0.96	1.36	1.03	0.14
Sum(Adj)	102.24	101.47	100.86	100.95	99.28	100.02	100.74	100.91	99.25	100.52
Si	2.92	2.96	2.94	2.94	2.93	2.95	3.00	3.01	2.94	2.91
Al	0.08	0.04	0.06	0.06	0.07	0.05	0.00	0.00	0.06	0.09
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.01	3.00	3.00
Al	0.60	0.09	0.65	0.06	1.21	1.18	0.73	0.75	1.23	1.18
Fe+3	1.37	1.87	1.30	1.92	0.64	0.59	1.16	1.08	0.35	0.55
Ti	0.00	0.00	0.02	0.00	0.08	0.14	0.06	0.07	0.18	0.16
Cr	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.13	0.04
Y	1.97	1.96	1.97	1.98	1.95	1.91	1.95	1.91	1.88	1.93
Fe+2	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.09	0.07	0.01
Mg	0.03	0.04	0.03	0.03	0.07	0.08	0.03	0.04	0.09	0.08
Ca	2.98	3.00	2.98	2.98	2.98	2.95	2.94	2.95	2.96	2.97
Mn	0.02	0.01	0.02	0.01	0.00	0.00	0.02	0.01	0.00	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.04	3.03	3.02	3.05	3.09	3.05	3.08	3.12	3.07
Ad	67.46	92.60	64.58	95.02	32.13	29.88	58.51	54.99	17.80	28.09
Uv	0.00	0.00	0.00	0.00	1.09	0.16	0.10	0.26	6.59	1.78
Py	1.13	1.31	1.11	1.11	2.28	2.82	1.05	1.21	2.93	2.83
Al	0.00	0.00	0.00	0.00	0.00	1.61	2.18	3.10	2.32	0.30
Sp	0.56	0.19	0.50	0.21	0.09	0.14	0.62	0.28	0.16	0.18
Gr	30.83	5.91	33.81	3.66	64.41	65.40	37.55	40.16	70.20	66.81

76CB3 Garnet analyses

Grain	GA11-7	GA11-8
Point		
Optics	A/c	A/c
SiO2	37.06	37.09
Al2O3	12.89	16.33
FeO(T)	8.33	4.98
MgO	0.73	0.79
CaO	35.36	35.74
Na2O	0.00	0.02
TiO2	2.42	2.91
MnO	0.12	0.11
Cr2O3	1.32	0.79
Sum	98.23	98.76

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	9.25	5.53
FeO(c)	0.00	0.00
Sum(Adj)	99.15	99.31
Si	2.93	2.88
Al	0.07	0.12
Z	3.00	3.00
Al	1.13	1.38
Fe+3	0.55	0.32
Ti	0.14	0.17
Cr	0.09	0.05
Y	1.91	1.92
Fe+2	0.00	0.00
Mg	0.09	0.09
Ca	3.00	2.98
Mn	0.01	0.01
Na	0.00	0.00
X	3.09	3.08
Ad	27.96	16.36
Uv	4.19	2.45
Pv	2.92	3.09
Al	0.00	0.00
Sp	0.27	0.24
Gr	64.67	77.84

76CB4 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA1-6	GA1-7	GA1-8	GA1-9	GA1-10
Point	r/CR	17/CR	38/CR	59/CR			/CR/	r		
Optics	*	*	*	A/g	A/g	A/g	A/g	A/g	*	*
SiO2	41.16	38.08	39.41	38.35	37.86	38.19	37.83	37.19	37.04	35.12
Al2O3	4.08	5.54	6.32	13.07	10.68	11.54	16.69	8.38	10.93	7.89
FeO(T)	2.46	3.81	10.41	8.10	14.89	8.17	6.97	18.39	10.63	13.50
MgO	8.94	5.13	4.40	1.42	0.24	0.24	0.44	0.20	0.26	0.97
CaO	26.70	29.63	33.30	34.83	34.24	34.31	36.25	34.89	34.77	34.84
Na2O	0.05	0.01	0.01	0.03	0.01	0.00	0.02	0.00	0.01	0.00
TiO2	12.04	17.83	3.78	2.09	0.84	1.34	0.79	0.07	1.06	4.06
MnO	0.11	0.03	0.06	0.13	0.37	0.50	0.20	0.19	0.40	0.12
Cr2O3	0.51	1.19	1.86	0.95	1.04	5.58	0.55	n.d.	n.d.	n.d.
Sum	96.05	101.25	99.55	98.97	100.17	99.87	99.74	99.31	95.10	96.50

* Points in between and around a broken chromite grain; many have high Ti as well as Cr and are non-stoichiometric; may represent diffusion of Cr and Ti into garnet from included chromite and Fe-Ti oxide grains or mixture of fine-grained phases
Green color in garnet is localized around chromite.

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	11.57	8.66	15.09	6.88	7.74	20.43	11.81	15.00
FeO(c)	0.00	0.31	1.31	1.98	0.00	0.00	0.00	0.00
Sum(Adj)	100.71	99.83	101.68	100.56	100.51	101.35	96.28	98.00
Si	3.09	2.99	2.98	3.01	2.91	2.97	3.04	2.88
Al	0.00	0.01	0.02	0.00	0.09	0.03	0.00	0.12
Z	3.09	3.00	3.00	3.01	3.00	3.00	3.04	3.00
Al	0.58	1.20	0.97	1.07	1.42	0.75	1.06	0.64
Fe+3	0.68	0.51	0.89	0.41	0.45	1.23	0.73	0.92
Ti	0.22	0.12	0.05	0.08	0.05	0.00	0.07	0.25
Cr	0.12	0.06	0.06	0.35	0.03	0.00	0.00	0.00
Y	1.60	1.89	1.97	1.91	1.95	1.98	1.85	1.81
Fe+2	0.00	0.02	0.09	0.13	0.00	0.00	0.00	0.00
Mg	0.51	0.17	0.03	0.03	0.05	0.02	0.03	0.12
Ca	2.79	2.91	2.88	2.90	2.99	2.98	3.05	3.06
Mn	0.00	0.01	0.02	0.03	0.01	0.01	0.03	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.31	3.11	3.03	3.09	3.05	3.02	3.11	3.19
Ad	36.32	26.07	44.92	20.75	22.21	60.92	37.18	47.45
Uv	6.14	3.01	3.25	17.68	1.66	0.00	0.00	0.00
Py	18.28	5.66	0.94	0.96	1.67	0.79	1.08	4.06
Al	0.00	0.69	2.89	4.42	0.00	0.00	0.00	0.00
Sp	0.14	0.29	0.83	1.13	0.43	0.43	0.95	0.29
Gr	39.13	64.28	47.17	55.06	74.04	37.87	60.79	48.20

76CB4 Garnet analyses

Grain	GA2-1	GA2-2	GA3-1	GA3-2	GA3-3	GA3-4	GA3-5	GA3-6	GA3-7	GA3-8
Point	r	m	@ r/@	10	20	30	40	50	60	70
Optics	<					A/c				>
SiO2	36.03	37.21	36.85	36.83	35.67	36.55	37.25	37.53	37.34	36.78
Al2O3	5.88	9.50	6.47	6.22	6.05	8.30	7.60	9.72	10.72	6.65
FeO(T)	21.91	17.73	19.93	20.81	20.49	18.18	19.37	17.02	16.18	20.58
MgO	0.24	0.22	0.24	0.25	0.26	0.21	0.22	0.17	0.20	0.23
CaO	34.97	34.30	34.25	34.49	34.73	35.00	34.16	34.88	35.40	34.81
Na2O	0.02	0.01	0.02	0.00	0.02	0.01	0.01	0.01	0.00	0.00
TiO2	0.08	0.16	0.47	0.33	0.55	0.25	0.18	0.04	0.08	0.08
MnO	0.15	0.34	0.11	0.12	0.12	0.18	0.15	0.25	0.29	0.19
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	99.28	99.47	98.34	99.05	97.89	98.68	98.94	99.62	100.21	99.32

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	24.34	19.78	22.14	23.12	22.76	20.20	21.14	18.91	17.98	22.86
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00
Sum(Adj)	101.71	101.44	100.55	101.36	100.16	100.70	101.05	101.51	102.31	101.60
Si	2.90	2.95	2.99	2.97	2.91	2.93	2.99	2.97	2.93	2.95
Al	0.10	0.05	0.01	0.03	0.09	0.07	0.01	0.03	0.07	0.05
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.46	0.84	0.61	0.56	0.49	0.72	0.71	0.88	0.92	0.58
Fe+3	1.48	1.18	1.35	1.40	1.40	1.22	1.28	1.13	1.06	1.38
Ti	0.00	0.01	0.03	0.02	0.03	0.02	0.01	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	2.03	1.99	1.98	1.92	1.95	2.00	2.00	1.98	1.97
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Mg	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02
Ca	3.02	2.92	2.98	2.98	3.04	3.01	2.94	2.96	2.97	2.99
Mn	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.06	2.97	3.01	3.02	3.08	3.05	3.00	3.00	3.02	3.03
Ad	72.45	58.46	67.80	69.97	69.11	60.36	63.93	56.00	52.32	68.44
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.95	0.86	0.97	1.00	1.04	0.83	0.88	0.67	0.77	0.91
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0.00
Sp	0.34	0.76	0.25	0.27	0.27	0.40	0.34	0.56	0.63	0.43
Gr	26.26	39.92	30.97	28.75	29.57	38.40	34.07	42.78	46.28	30.22

76CB4 Garnet analyses

Grain	GA3-9	GA3-10	GA3-11	GA3-12	GA3-13	GA3-14	GA3-15	GA3-16	GA3-17	GA3-18
Point	80	90	100	110	120	130	140	150	160	170
Optics	<					A/c				>
SiO2	36.66	37.34	37.92	38.27	36.91	37.05	37.10	36.69	36.23	36.47
Al2O3	9.88	13.45	13.10	12.47	9.73	10.01	10.01	7.55	6.49	6.44
FeO(T)	16.83	12.57	13.54	13.53	17.17	17.25	16.66	19.20	20.57	20.85
MgO	0.20	0.22	0.18	0.20	0.21	0.25	0.22	0.24	0.21	0.22
CaO	35.45	35.38	35.26	35.01	34.63	34.80	35.01	34.50	34.74	34.62
Na2O	0.00	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.01
TiO2	0.02	0.04	0.02	0.42	0.48	0.29	0.07	0.24	0.46	0.38
MnO	0.28	0.36	0.31	0.35	0.32	0.28	0.31	0.18	0.20	0.16
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	99.32	99.36	100.35	100.25	99.46	99.94	100.18	98.60	98.90	99.15

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	18.70	13.97	15.04	14.40	19.08	19.16	18.51	21.33	22.85	23.16
FeO(c)	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.19	100.76	101.85	101.69	101.37	101.85	102.03	100.73	101.18	101.46
Si	2.91	2.92	2.94	2.98	2.93	2.92	2.92	2.96	2.92	2.94
Al	0.09	0.08	0.06	0.02	0.07	0.08	0.08	0.04	0.08	0.06
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.83	1.16	1.14	1.13	0.84	0.85	0.85	0.67	0.54	0.55
Fe+3	1.12	0.82	0.89	0.84	1.14	1.14	1.10	1.29	1.39	1.40
Ti	0.00	0.00	0.00	0.02	0.03	0.02	0.05	0.01	0.03	0.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.95	1.99	2.02	1.99	2.01	2.01	2.00	1.98	1.96	1.97
Fe+2	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
Ca	3.01	2.97	2.93	2.92	2.94	2.94	2.95	2.98	3.00	2.99
Mn	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.01	2.98	3.01	2.99	2.99	3.00	3.02	3.04	3.03
Ad	54.76	40.48	43.49	42.25	56.50	56.23	54.55	64.28	68.73	69.64
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.77	0.84	0.69	0.78	0.92	0.97	0.86	0.96	0.84	0.87
Al	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.62	0.78	0.67	0.77	0.71	0.62	0.69	0.41	0.45	0.36
Gr	43.85	57.89	55.15	54.96	41.96	42.18	43.90	34.35	29.98	29.13

76CB4 Garnet analyses

Grain	GA3-19	GA3-20	GA3-21	GA3-22	GA3-23	GA3-24	GA3-25	GA3-26	GA3-27	GA3-28
Point	180	190	200	210	220				c	
Optics	A/c	A/c	/				A/g	)	/c	/c
			*							
SiO2	36.86	36.69	36.14	35.43	35.36	35.50	35.03	35.92	36.37	37.30
Al2O3	7.93	5.73	6.79	8.13	6.69	5.96	5.69	6.60	6.72	9.39
FeO(T)	19.09	20.93	14.59	13.63	13.58	14.29	15.29	14.23	19.91	17.50
MgO	0.24	0.31	0.43	0.33	0.41	0.63	0.52	0.40	0.27	0.25
CaO	34.85	34.91	35.34	35.29	34.80	35.20	35.06	35.13	34.65	34.30
Na2O	0.02	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.01
TiO2	0.30	1.11	2.87	1.61	2.70	3.85	2.93	2.55	1.00	0.91
MnO	0.29	0.20	0.23	0.28	0.22	0.25	0.18	0.23	0.13	0.28
Cr2O3	n.d.	n.d.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	99.66	99.88	96.35	94.70	93.77	95.70	94.71	95.06	99.05	99.94

* EDS spectra for points 21 through 26 show Cr peaks

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	21.21	23.25	16.21	15.14	15.09	15.88	16.99	15.81	22.12	18.67
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78
Sum(Adj)	101.78	102.20	97.97	96.21	95.28	97.29	96.41	96.64	101.26	101.81
Si	2.94	2.94	2.98	2.95	2.99	2.95	2.94	2.99	2.93	2.95
Al	0.06	0.06	0.02	0.05	0.01	0.05	0.06	0.01	0.07	0.05
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.68	0.48	0.63	0.74	0.65	0.53	0.51	0.64	0.57	0.83
Fe+3	1.27	1.40	1.00	0.95	0.96	0.99	1.07	0.99	1.34	1.11
Ti	0.02	0.07	0.18	0.10	0.17	0.24	0.19	0.16	0.06	0.05
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.97	1.95	1.81	1.79	1.78	1.77	1.76	1.80	1.97	2.00
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Mg	0.03	0.04	0.05	0.04	0.05	0.06	0.07	0.05	0.03	0.03
Ca	2.97	3.00	3.12	3.15	3.15	3.13	3.16	3.14	2.99	2.91
Mn	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.05	3.19	3.21	3.22	3.23	3.24	3.20	3.03	3.00
Ad	63.88	70.23	51.77	47.86	49.51	51.64	55.11	51.18	66.90	55.70
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.94	1.24	1.82	1.38	1.78	2.71	2.23	1.71	1.08	0.99
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54
Sp	0.65	0.45	0.55	0.67	0.54	0.61	0.44	0.56	0.30	0.63
Gr	35.33	28.08	45.86	50.09	48.16	45.04	42.21	46.54	31.73	41.14

76CB4 Garnet analyses

Grain	GA3-29	GA3-30	GA4	GA5-1	GA5-2	GA6-1	GA6-2	GA6-3	GA6-4	GA6-5
Point	r(=1)	c		r	c	r	m	m	m	m
Optics	<		A/c		>	<		I/v	>	A/c
SiO2	36.75	35.82	37.66	36.59	38.13	34.87	35.24	35.69	35.18	36.71
Al2O3	6.00	7.17	11.62	10.05	12.90	0.02	0.06	0.06	0.11	7.88
FeO(T)	20.66	14.20	14.64	16.59	13.00	28.54	28.65	29.42	28.94	19.26
MgO	0.25	0.36	0.22	0.19	0.21	0.20	0.23	0.21	0.23	0.22
CaO	34.31	34.73	35.59	35.42	35.90	33.73	33.82	33.53	33.49	35.04
Na2O	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.00
TiO2	0.47	1.61	0.08	0.00	0.00	0.01	0.00	0.00	0.00	0.10
MnO	0.18	0.25	0.27	0.20	0.28	0.11	0.11	0.10	0.16	0.12
Cr2O3	0.22	3.82	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.84	98.17	100.10	99.05	100.42	97.48	98.11	99.02	98.11	99.33

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	22.95	15.78	16.27	18.43	14.44	31.71	31.83	32.69	32.15	21.40
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.13	99.75	101.73	100.89	101.86	100.65	101.29	102.29	101.32	101.47
Si	2.97	2.91	2.94	2.91	2.96	2.93	2.94	2.95	2.94	2.93
Al	0.03	0.09	0.06	0.09	0.04	0.00	0.01	0.01	0.01	0.07
Z	3.00	3.00	3.00	3.00	3.00	2.93	2.94	2.96	2.95	3.00
Al	0.54	0.60	1.01	0.85	1.13	0.00	0.00	0.00	0.00	0.67
Fe+3	1.40	0.96	0.96	1.10	0.84	2.00	2.00	2.03	2.02	1.29
Ti	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Cr	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.98	1.92	1.97	1.95	1.98	2.00	2.00	2.03	2.02	1.97
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.04	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.03
Ca	2.97	3.02	2.98	3.01	2.98	3.03	3.02	2.97	2.99	3.00
Mn	0.01	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.02	3.08	3.03	3.05	3.02	3.07	3.06	3.01	3.03	3.03
Ad	69.87	48.41	47.35	54.88	41.74	98.73	98.66	98.93	98.70	63.53
Uv	0.70	12.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	1.01	1.46	0.85	0.74	0.80	0.82	0.94	0.84	0.93	0.86
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.41	0.58	0.59	0.44	0.61	0.26	0.26	0.23	0.37	0.27
Gr	28.01	37.23	51.22	44.74	56.85	0.18	0.14	0.00	0.00	35.34

76CB4 Garnet analyses

Grain	GA6-6
Point	c
Optics	A/c
SiO2	36.70
Al2O3	11.58
FeO(T)	14.67
MgO	0.24
CaO	35.32
Na2O	0.01
TiO2	0.00
MnO	0.20
Cr2O3	n.d.
Sum	98.72

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	16.30
FeO(c)	0.00
Sum(Adj)	100.35
Si	2.91
Al	0.09
Z	3.00
Al	0.99
Fe+3	0.97
Ti	0.00
Cr	0.00
Y	1.96
Fe+2	0.00
Mg	0.03
Ca	3.00
Mn	0.01
Na	0.00
X	3.04
Ad	47.69
Uv	0.00
Py	0.93
Al	0.00
Sp	0.44
Gr	50.94

76CB5 Garnet analyses

Grain	GA1-1	GA1-2		GA1-4	GA2-1	GA2-2	GA2-3	GA3-1	GA3-2	GA3-3
Point	r	ir		c	r/Q	oc	c	r/Q	oc	c
Optics	A/c	A/c	I/v	I/v	A/c	A/c	I/c	A/c	A/c	I/c
						GA2, GA3, GA4 [Q]				
SiO2	36.00	36.76	35.69	35.42	35.63	36.00	35.79	36.53	36.49	34.95
Al2O3	6.56	9.81	0.18	3.86	5.01	6.40	2.56	7.17	10.18	2.69
FeO(T)	20.84	16.13	28.75	23.76	22.66	20.40	26.11	19.65	15.42	23.53
MgO	0.17	0.21	0.44	0.25	0.22	0.33	0.34	0.17	0.21	0.49
CaO	34.51	34.79	33.33	34.05	34.29	34.49	33.99	34.36	35.04	34.24
Na2O	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00
TiO2	0.06	1.30	0.02	0.31	0.07	0.39	0.03	0.18	1.05	1.66
MnO	0.12	0.25	0.21	0.19	0.13	0.21	0.13	0.22	0.25	0.21
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.28	99.25	98.63	97.85	98.01	98.22	98.95	98.28	98.65	97.77

Formula basis = 8 cations, 12 oxygens

Fe2O3(c'	23.15	17.92	31.94	26.40	25.18	22.66	29.01	21.83	17.13	26.14
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.59	101.04	101.82	100.49	100.53	100.48	101.85	100.46	100.36	100.38
Si	2.92	2.92	2.96	2.92	2.92	2.92	2.93	2.96	2.91	2.89
Al	0.08	0.08	0.02	0.08	0.08	0.08	0.07	0.04	0.09	0.11
Z	3.00	3.00	2.98	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.55	0.84	0.00	0.29	0.40	0.54	0.18	0.64	0.87	0.16
Fe+3	1.41	1.07	1.99	1.64	1.55	1.38	1.79	1.33	1.03	1.63
Ti	0.00	0.08	0.00	0.02	0.00	0.02	0.00	0.01	0.06	0.10
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.97	1.99	1.99	1.95	1.96	1.94	1.97	1.98	1.96	1.89
Fe+2	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.02	0.05	0.07	0.03	0.04	0.04	0.02	0.02	0.06
Ca	3.00	2.96	2.96	3.01	3.01	3.00	2.98	2.98	3.00	3.04
Mn	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.01	3.03	3.05	3.04	3.06	3.03	3.02	3.04	3.11
Ad	69.71	53.64	97.74	80.84	76.35	68.52	88.19	66.10	51.19	81.37
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.68	0.83	1.78	1.01	0.88	1.32	1.37	0.68	0.83	2.02
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.27	0.56	0.48	0.44	0.30	0.48	0.30	0.50	0.56	0.49
Gr	29.35	44.97	0.00	17.71	22.47	29.68	10.15	32.72	47.42	16.12

76CB5 Garnet analyses

Grain	GA4-1	GA4-2	GA4-3	GA5-1	GA5-2	GA6-1	GA6-2	GA6-3	GA6-4	GA7-1
Point	r	oc	c	(2)		r	r	m	c	r
Notice	A/c	A/c	A/c	I/c	I/c	< fine-scale zoning		>	I	A/c
SiO2	35.34	35.32	35.48	34.65	35.56	35.02	34.96	35.40	34.77	35.51
Al2O3	4.77	2.19	4.07	1.26	1.93	0.70	5.77	4.19	0.75	5.11
FeO(T)	23.12	26.18	21.81	26.40	25.69	28.04	21.99	23.03	28.14	22.29
MgO	0.24	0.29	0.50	0.58	0.59	0.43	0.17	0.33	0.43	0.30
CaO	33.63	33.47	34.38	33.51	33.64	33.34	33.77	34.22	33.64	34.62
Na2O	0.01	0.02	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00
TiO2	0.15	0.06	2.27	0.65	0.55	0.01	0.18	0.63	0.03	0.15
MnO	0.40	0.16	0.18	0.27	0.22	0.16	0.22	0.16	0.27	0.15
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.67	97.69	98.69	97.32	98.18	97.70	96.99	97.97	98.04	98.13

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	25.70	29.09	24.23	29.33	28.54	31.15	24.32	25.59	31.26	24.76
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.24	100.60	101.11	100.25	101.03	100.81	99.42	100.53	101.16	100.60
Si	2.91	2.93	2.90	2.90	2.94	2.92	2.89	2.91	2.89	2.90
Al	0.09	0.07	0.10	0.10	0.06	0.07	0.11	0.09	0.07	0.10
Z	3.00	3.00	3.00	3.00	3.00	2.99	3.00	3.00	2.97	3.00
Al	0.37	0.15	0.29	0.02	0.13	0.00	0.45	0.31	0.00	0.39
Fe-3	1.59	1.82	1.49	1.85	1.77	1.96	1.51	1.55	1.96	1.52
Ti	0.01	0.00	0.14	0.04	0.03	0.00	0.01	0.04	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.97	1.97	1.92	1.91	1.93	1.96	1.97	1.93	1.96	1.92
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.04	0.06	0.07	0.07	0.05	0.02	0.04	0.05	0.04
Ca	2.97	2.98	3.01	3.00	2.98	2.98	2.99	3.01	3.00	3.03
Mn	0.03	0.01	0.01	0.02	0.02	0.01	0.02	0.01	0.02	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.03	3.08	3.09	3.07	3.05	3.03	3.07	3.07	3.08
Ad	78.36	89.85	75.02	91.12	88.22	96.44	74.12	78.29	95.91	74.75
Uv	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Py	3.97	1.19	2.05	2.38	2.41	1.76	0.69	1.34	1.75	1.20
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.92	0.37	0.42	0.67	0.51	0.37	0.50	0.37	0.62	0.34
Gr	19.75	8.59	22.52	5.86	8.35	1.43	24.69	20.01	1.73	23.71

76CB5 Garnet analyses

Grain	GA7-2	GA7-2'
Point	rc	rc
Optics	I/v	I/v
SiO2	33.81	33.90
Al2O3	0.68	0.82
FeO(T)	24.14	26.10
MgO	0.66	0.59
CaO	33.82	33.12
Na2O	0.01	0.01
TiO2	3.64	1.90
MnO	0.22	0.30
Cr2O3	n.d.	n.d.
Sum	96.98	96.64

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	24.82	29.00
FeO(c.	0.00	0.00
Sum(Adj)	99.66	99.54
Si	2.85	2.86
Al	0.07	0.02
Z	2.92	2.95
Al	0.00	0.00
Fe+3	1.70	1.84
Ti	0.23	0.11
Cr	0.00	0.00
Y	1.93	1.96
Fe+2	0.00	0.00
Mg	0.08	0.07
Ca	3.05	3.00
Mn	0.02	0.02
Na	0.00	0.00
X	3.15	3.10
Ad	86.41	91.83
Uv	0.00	0.00
Py	2.81	2.47
Al	0.00	0.00
Sp	0.53	0.71
Gr	10.24	4.99

76CB6 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA3-1	GA3-1*	GA3-2	GA3-2*	GA3-3	GA3-3*
Area	r	c	r	c	r	r	(2)I/y	I/y	/c	/c
Optics	A/c	I/c	A/c	A/c	A/c	A/c	band	band	c	c
SiO2	36.19	37.34	36.78	36.75	35.90	36.67	32.79	33.95	35.78	36.37
Al2O3	6.53	11.16	5.32	6.43	6.97	5.70	0.25	0.07	2.20	4.09
FeO(T)	20.81	14.44	22.01	19.20	20.31	21.38	28.40	28.28	25.71	23.32
MgO	0.21	0.23	0.18	0.40	0.22	0.17	0.26	0.27	0.37	0.34
CaO	34.21	35.55	34.27	34.63	34.29	34.54	32.78	33.13	34.20	33.89
Na2O	0.01	0.00	0.02	0.02	0.00	0.01	0.00	0.02	0.00	0.01
TiO2	0.52	0.28	0.01	0.05	0.48	0.03	0.02	0.00	0.06	0.27
MnO	0.19	0.20	0.15	0.36	0.26	0.13	1.09	0.96	0.09	0.15
Cr2O3	0.03	0.01	0.01	0.00	n.d.	0.00	n.d.	0.01	n.d.	0.01
Sum	98.72	[illegible]	98.75	99.84	98.43	98.63	95.59	96.69	98.43	98.45

* Repeat analyses on same part of the grain on a different day with a different standardization

Formula basis = 8 cations 12 oxygens

	GA1-1	GA1-2	GA2-1	GA2-2	GA3-1	GA3-1*	GA3-2	GA3-2*	GA3-3	GA3-3*
Fe2O3(c)	[illegible]	[illegible]	[illegible]	21.06	22.56	23.75	31.55	31.42	28.56	25.91
FeO(c)	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Sum Ad	101.01	100.81	101.19	101.94	100.68	101.20	98.73	99.83	101.28	101.04
Si	2.93	2.95	2.98	2.94	2.91	2.97	2.81	2.88	2.94	2.97
Al	0.07	0.05	0.02	0.06	0.09	0.03	0.03	0.01	0.06	0.03
Z	3.00	3.00	3.00	3.00	3.00	3.00	2.84	2.88	3.00	3.00
Al	0.55	0.98	0.49	0.55	0.57	0.53	0.00	0.00	0.16	0.37
Fe+3	1.41	0.95	1.49	1.27	1.38	1.45	2.04	2.00	1.77	1.59
Ti	0.03	0.02	0.00	0.12	0.03	0.00	0.00	0.00	0.00	0.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.99	1.95	1.99	1.94	1.98	1.98	2.04	2.00	1.93	1.98
Fe+2	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.03	0.02	0.05	0.03	0.02	0.03	0.03	0.05	0.04
Ca	2.97	3.01	2.98	2.97	2.98	2.99	3.01	3.01	3.02	2.97
Mn	0.01	0.01	0.01	0.02	0.02	0.01	0.08	0.07	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.01	3.05	3.01	3.06	3.02	3.02	3.12	3.11	3.07	3.02
Ad	69.87	47.28	74.44	64.26	67.94	71.84	96.47	96.65	87.58	79.55
Uv	0.10	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.03
Py	0.84	0.90	0.72	1.61	0.88	0.68	1.05	1.10	1.50	1.38
Al	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.43	0.44	0.34	0.83	0.59	0.30	2.48	2.22	0.21	0.35
Gr	28.76	51.35	24.46	32.72	30.60	27.18	0.00	0.00	10.72	18.69

76CB7a Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA2-1	GA2-2	GA2-3	GA3-1	GA3-2	GA3-3	GA3-4
Point	(2)r	c	c	r	(2)c	m	r	m	clear	yellow
Optics	<		A/c small garnets with altered cores			>	< large, zoned		A/c	I/y >
SiO2	36.76	36.70	36.28	37.24	35.85	37.98	38.88	36.27	35.52	37.02
Al2O3	1.15	1.82	5.17	3.74	5.05	8.28	14.69	0.25	0.62	4.95
FeO(T)	27.16	26.32	21.03	24.64	20.55	16.87	11.16	28.68	28.16	23.06
MgO	0.23	0.15	0.19	0.21	0.18	0.24	0.20	0.24	0.26	0.20
CaO	33.58	33.81	34.14	34.12	34.40	34.61	35.95	33.62	33.89	34.29
Na2O	0.00	0.01	0.00	0.00	0.01	0.01	0.02	0.00	0.01	0.01
TiO2	0.00	0.42	2.04	0.00	2.16	1.86	0.13	0.01	0.02	0.20
MnO	0.15	0.12	0.20	0.13	0.22	0.22	0.30	0.15	0.13	0.15
Cr2O3	0.00	0.00	0.02	0.00	0.01	0.01	0.01	0.01	0.00	0.01
Sum	99.03	99.35	99.07	100.08	98.43	100.08	101.34	99.23	98.61	99.89
K2O	0.01	0.00	0.00	0.00	0.03	0.02	0.00	0.04	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	29.76	28.68	22.33	27.03	22.67	16.47	12.40	31.86	31.29	25.62
FeO(c)	0.37	0.51	0.93	0.31	0.15	2.05	0.00	0.00	0.00	0.00
Sum(Adj)	102.00	102.22	101.30	102.78	100.69	101.73	102.58	102.41	101.74	102.45
Si	3.02	3.00	2.95	3.00	2.93	3.01	2.97	2.99	2.94	2.98
Al	0.00	0.00	0.05	0.00	0.07	0.00	0.03	0.01	0.06	0.02
Z	3.02	3.00	3.00	3.00	3.00	3.01	3.00	3.00	3.00	3.00
Al	0.11	0.18	0.44	0.36	0.41	0.77	1.29	0.01	0.00	0.45
Fe+3	1.84	1.77	1.36	1.64	1.39	0.98	0.71	1.98	1.95	1.55
Ti	0.00	0.03	0.12	0.00	0.13	0.11	0.01	0.00	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.95	1.97	1.93	2.00	1.94	1.87	2.01	1.99	1.95	2.01
Fe+2	0.03	0.03	0.06	0.02	0.01	0.14	0.00	0.00	0.00	0.00
Mg	0.03	0.02	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.02
Ca	2.96	2.97	2.97	2.95	3.01	2.94	2.94	2.97	3.01	2.95
Mn	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.02	3.03	3.07	3.00	3.06	3.12	2.99	3.01	3.05	2.99
Ad	92.55	88.90	69.19	82.06	70.56	50.39	35.49	98.61	96.36	77.38
Uv	0.00	0.00	0.07	0.00	0.03	0.03	0.03	0.03	0.00	0.07
Py	0.95	0.61	0.78	0.84	0.74	0.97	0.76	0.98	1.06	0.80
Al	0.85	1.17	2.15	0.69	0.34	4.65	0.00	0.00	0.30	0.40
Sp	0.35	0.28	0.47	0.30	0.51	0.51	0.65	0.35	0.30	0.34
Gr	5.30	9.04	27.36	16.11	27.82	43.45	63.08	0.02	2.28	21.45

76CB7a Garnet analyses

Grain	GA[illegible]-4	GA3-6	GA4-[illegible]	GA4-[illegible]	GA4-[illegible]	GA4-4	GA5-1	GA5-2	GA6-1	GA6-2
Point	band	r	r	r	m	[illegible]	r	c	r	m
Optics	I/v		/		I/v	[illegible]	I/v	I/v	A/c	A/c
SiO2	36.5[illegible]	[illegible]	36.1[illegible]	35.47	35.60	35.50	36.25	35.30	38.11	37.47
Al2O3	1.56	[illegible].68	0.22	0.02	0.01	0.03	0.00	0.05	9.17	4.99
FeO(T)	26.69	21.95	28.[illegible]	29.03	29.07	28.26	28.43	28.66	17.90	22.65
MgO	0.12	0.13	0.17	0.19	0.20	0.23	0.16	0.17	0.21	0.24
CaO	33.85	34.37	33.22	33.11	33.07	33.12	33.23	33.31	34.83	34.34
Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
TiO2	0.01	0.15	0.00	0.01	0.00	0.00	0.00	0.00	0.16	0.02
MnO	0.13	0.21	0.13	0.15	0.15	0.14	0.21	0.14	0.19	0.25
Cr2O3	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.02	0.00
Sum	99.13	100.10	98.60	97.98	98.10	97.30	98.30	97.66	100.60	99.96
K2O	0.00	0.00	0.03	0.01	0.00	0.00	0.01	0.01	0.01	0.02

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	29.65	24.02	31.74	32.25	32.30	31.40	31.33	31.84	19.36	25.00
FeO(c)	0.00	0.33	0.18	0.00	0.00	0.00	0.23	0.00	0.47	0.14
Sum(Adj)	102.09	102.50	101.77	101.20	101.33	100.44	101.43	100.84	102.53	102.46
Si	3.01	3.00	3.00	2.97	2.97	2.99	3.02	2.96	2.99	3.01
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Z	3.01	3.00	3.00	2.97	2.97	2.99	3.02	2.96	3.00	3.01
Al	0.15	0.54	0.02	0.00	0.00	0.00	0.00	0.00	0.84	0.47
Fe+3	1.83	1.45	1.98	2.03	2.03	1.99	1.96	2.01	1.14	1.51
Ti	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0[illegible]	0.00
Y	1.98	1.99	2.00	2.03	2.03	1.99	1.96	2.01	2.00	1.98
Fe+2	0.00	0.02	0.01	0.00	0.00	0.00	0.02	0.00	0.03	0.01
Mg	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.03
Ca	2.97	2.96	2.95	2.97	2.96	2.98	2.96	2.99	2.93	2.95
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.01	3.01	3.00	3.00	3.00	3.02	3.02	3.02	3.00	3.01
Ad	91.66	72.44	98.56	98.88	98.95	98.65	98.28	98.88	57.29	75.67
Uv	0.00	0.00	0.00	0.00	0.00	0.07	0.03	0.10	0.06	0.00
Py	0.92	0.91	0.70	0.77	0.81	0.94	0.66	0.70	0.82	0.96
Al	0.00	0.[illegible]	[illegible]	0.00	0.00	0.00	0.53	0.00	1.04	0.32
Sp	0.30	0.48	0.30	0.35	0.3[illegible]	0.33	0.50	0.33	0.42	0.57
Gr	[illegible].14	25.47	0.00	0.00	0.00	0.00	0.00	0.00	40.36	22.49

76CB7; Garnet analyses

Grain	GA6-3	GA7-1	GA9-1	GA9-2	GA9-3
Point	c	/EP	/EP	/EP	/EP
Obs'ns	A/c		A/c	A/c	
SiO2	36.20	37.56	37.36	37.48	39.11
Al2O3	5.14	7.44	6.66	5.57	16.27
FeO(T)	21.35	19.32	20.54	21.51	7.19
MgO	0.19	0.35	0.25	0.23	0.61
CaO	34.34	34.50	34.60	33.86	36.00
Na2O	0.01	0.00	0.00	0.01	0.02
TiO2	1.27	0.47	0.32	0.48	1.60
MnO	0.20	0.20	0.21	0.20	0.14
Cr2O3	0.03	0.00	0.01	0.01	0.02
Sum	98.73	99.73	99.95	99.65	100.96
K2O	0.03	0.00	0.00	0.03	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	23.72	20.89	22.82	22.89	7.15
FeO(c)	0.00	0.52	0.00	1.21	0.76
Sum(Adj)	101.10	101.81	102.23	101.94	101.67
Si	2.94	3.00	2.98	3.01	2.98
Al	0.06	0.00	0.02	0.00	0.02
Z	3.00	3.00	3.00	3.01	3.00
Al	0.44	0.69	0.61	0.53	1.43
Fe+3	1.45	1.25	1.37	1.39	0.41
Ti	0.08	0.03	0.02	0.03	0.09
Cr	0.00	0.00	0.00	0.00	0.00
Y	1.97	1.98	2.00	1.94	1.94
Fe+2	0.00	0.03	0.00	0.08	0.05
Mg	0.02	0.03	0.03	0.03	0.07
Ca	2.99	2.95	2.96	2.92	2.93
Mn	0.01	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00
X	3.03	3.02	3.00	3.04	3.06
Ad	72.94	62.99	68.52	69.92	20.75
Uv	0.10	0.00	0.03	0.03	0.06
Py	0.77	0.92	0.99	0.93	2.34
Al	0.00	1.16	0.00	2.73	1.63
Sp	0.46	0.45	0.47	0.46	0.31
Gr	25.73	34.48	29.98	25.92	74.91

74CB7b Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2'	GA3-1	GA3-2	GA4-1	GA4-2	GA5-1	GA5-2
Point	r/KF	c	r	c	r/EP	e	r/EP	c	r/CC	c
Optics	<				A/c			>	A/c	IA/cv zoned
SiO2	38.15	34.95	36.92	38.52	38.06	39.61	36.69	37.00	36.22	37.10
Al2O3	10.60	2.71	5.80	9.77	8.17	14.87	3.59	7.94	5.97	9.28
FeO(T)	16.70	25.90	21.91	16.72	19.71	9.98	25.20	18.40	21.68	18.16
MgO	0.19	0.18	0.22	0.21	0.19	0.34	0.23	0.18	0.16	0.18
CaO	33.83	32.91	33.57	33.68	33.43	35.27	32.89	33.74	33.59	33.73
Na2O	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.00
TiO2	0.41	0.17	0.42	0.22	0.09	0.06	0.03	1.57	0.02	0.27
MnO	0.37	0.35	0.22	0.14	0.24	0.10	0.13	0.28	0.15	0.32
Cr2O3	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Sum	100.25	97.19	99.06	99.28	99.90	100.24	98.77	99.13	97.80	99.04
K2O	0.06	0.00	0.00	0.04	0.04	0.00	0.05	0.00	0.01	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	16.41	28.77	23.34	15.72	19.53	9.45	26.65	18.47	24.09	19.35
FeO(c)	1.93	0.00	0.98	2.57	2.13	1.47	1.22	1.77	0.00	0.74
Sum(Adj)	101.89	100.06	101.39	100.85	101.85	101.19	101.43	100.98	100.21	100.97
Si	3.00	2.92	2.99	3.04	3.03	3.05	3.00	2.97	2.96	2.94
Al	0.00	0.08	0.01	0.00	0.00	0.00	0.00	0.03	0.04	0.04
Z	3.00	3.00	3.00	3.06	3.03	3.05	3.00	3.00	3.00	3.02
Al	0.98	0.19	0.54	0.91	0.77	1.35	0.35	0.72	0.54	0.84
Fe+3	0.97	1.81	1.42	0.94	1.17	0.55	1.64	1.12	1.48	1.16
Ti	0.02	0.01	0.03	0.01	0.01	0.00	0.00	0.09	0.00	0.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.98	2.01	1.99	1.87	1.94	1.90	1.99	1.94	2.02	2.02
Fe+2	0.13	0.00	0.06	0.17	0.14	0.09	0.08	0.12	0.00	0.05
Mg	0.02	0.02	0.03	0.02	0.02	0.04	0.03	0.02	0.02	0.02
Ca	2.85	2.95	2.91	2.87	2.85	2.91	2.89	2.90	2.94	2.89
Mn	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.02	2.99	3.01	3.07	3.03	3.05	3.01	3.06	2.98	2.98
Ad	48.78	99.21	71.26	47.69	58.88	27.67	82.19	56.60	73.66	57.98
Uv	0.00	0.03	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00
Py	0.75	0.74	0.89	0.84	0.76	1.32	0.94	0.73	0.65	0.71
Al	4.25	0.00	2.04	5.79	4.77	3.20	2.79	4.04	0.00	1.65
Sp	0.83	0.82	0.50	0.36	0.54	0.22	0.30	0.64	0.34	0.72
Gr	45.39	9.21	25.31	45.32	35.05	67.58	13.73	37.96	25.35	38.94

76CB7t Garnet analyses

Grain	GA6-1	GA6-2
Point	r/CC	c
Optics	A/c	Al/vc zoned
SiO2	37.87	38.51
Al2O3	10.38	14.69
FeO(T)	16.75	10.61
MgO	0.20	0.32
CaO	34.46	34.93
Na2O	0.01	0.00
TiO2	0.09	0.36
MnO	0.22	0.13
Cr2O3	0.00	0.02
Sum	99.97	99.56
K2O	0.01	0.00

Formula basis = 8 cations, 12 ox/gens

Fe2O3(c)	17.97	10.77
FeO(c)	0.58	0.92
Sum(Adj)	101.77	100.64
Si	2.96	2.99
Al	0.02	0.01
Z	3.00	3.00
Al	0.95	1.34
Fe+3	1.06	0.63
Ti	0.00	0.02
Cr	0.00	0.00
Y	2.02	1.99
Fe+2	0.04	0.06
Mg	0.02	0.04
Ca	2.91	2.91
Mn	0.01	0.01
Na	0.00	0.00
X	2.98	3.01
Ad	53.12	31.57
Uv	0.00	0.06
Pv	0.78	1.24
Al	1.57	1.99
Sp	0.49	0.29
Gr	44.34	64.85

76CB8 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA2-1	GA2-2	GA3-1	GA3-2	GA3-3	GA3-4	GA3-5
Point	c	mc	r	r/0	c	r 0	40	80	120	160
Optics	/c			A/v		A/c	A/c	A/c	I/v	I/v
SiO2	40.03	39.45	37.26	36.00	37.65	37.25	38.52	38.29	35.22	34.94
Al2O3	18.86	16.77	7.21	1.20	6.23	9.24	13.94	14.56	0.73	0.17
FeO(T)	5.95	7.31	28.68	27.94	28.97	17.31	12.05	11.37	28.55	29.10
MgO	0.28	0.28	0.20	0.15	0.17	0.17	0.17	0.18	0.16	0.18
CaO	36.30	35.99	34.01	32.75	34.47	34.40	35.33	35.23	33.11	32.65
Na2O	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
TiO2	0.34	0.82	0.11	0.00	0.08	0.09	0.11	0.25	0.00	0.00
MnO	0.07	0.20	0.28	0.17	0.22	0.16	0.23	0.38	0.13	0.14
Cr2O3	0.02	0.04	0.00	0.02	0.00	0.00	0.00	0.03	0.00	0.03
Sum	101.85	100.87	99.67	98.24	99.80	98.61	100.35	100.29	97.92	97.21
K2O	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	5.40	6.96	22.40	30.37	22.90	19.19	12.99	12.45	31.72	32.33
FeO(c)	1.09	1.05	0.52	0.60	0.36	0.04	0.36	0.17	0.00	0.00
Sum(Adj)	102.39	101.56	101.91	101.27	102.09	100.55	101.65	101.53	101.09	100.44
Si	3.00	3.02	2.98	2.99	3.01	2.98	2.98	2.96	2.94	2.95
Al	0.00	0.00	0.02	0.01	0.00	0.02	0.02	0.04	0.06	0.02
Z	3.00	3.00	3.00	3.00	3.01	3.00	3.00	3.00	3.00	2.96
Al	1.66	1.50	0.66	0.11	0.59	0.85	1.25	1.29	0.01	0.00
Fe+3	0.30	0.40	1.35	1.90	1.38	1.16	0.76	0.72	1.99	2.05
Ti	0.02	0.05	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.98	1.95	2.01	2.01	1.97	2.01	2.01	2.03	2.01	2.05
Fe+2	0.07	0.07	0.03	0.04	0.02	0.00	0.02	0.01	0.00	0.00
Mg	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Ca	2.91	2.93	2.91	2.92	2.96	2.95	2.93	2.92	2.96	2.95
Mn	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.02	3.05	2.99	2.99	3.02	2.99	2.99	2.97	2.99	2.98
Ad	15.25	20.12	67.23	94.87	69.23	57.68	37.72	36.02	98.49	98.85
Uv	0.06	0.12	0.00	0.07	0.00	0.00	0.00	0.09	0.00	0.10
Py	1.05	1.07	0.79	0.62	0.68	0.68	0.65	0.69	0.74	0.73
Al	2.29	2.25	1.15	1.39	0.80	0.88	0.77	0.36	0.00	0.00
Sp	0.15	0.43	0.45	0.40	0.50	0.36	0.50	0.83	0.30	0.32
Gr	81.20	76.00	30.37	2.66	28.79	41.21	60.36	62.02	0.46	0.00

76CBB Garnet analyses

Grain	GA3-6	GA3-7	GA3-8	GA3-9	GA3-10	GA3-11	GA3-12	GA3-13	GA4-1	GA4-2
Point	200	240	280	320	400	480	560	640	r	c
Ootics	<					I/v				>
SiO2	35.05	35.06	35.20	35.13	34.97	34.76	34.76	35.42	35.37	35.43
Al2O3	0.13	0.32	0.42	0.66	0.00	0.04	0.31	0.30	0.14	0.00
FeO(T)	29.52	28.43	29.15	28.64	29.28	29.54	28.92	28.53	29.02	29.50
MgO	0.18	0.19	0.14	0.15	0.17	0.21	0.18	0.16	0.18	0.18
CaO	32.96	32.83	32.86	33.05	32.85	32.34	32.88	32.44	33.02	32.81
Na2O	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01
TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
MnO	0.10	0.13	0.11	0.10	0.12	0.13	0.15	0.42	0.15	0.12
Cr2O3	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.00
Sum	97.95	96.97	97.88	97.81	97.41	97.05	97.22	97.28	97.89	98.05
K2O	0.01	0.01	0.03	0.00	0.00	0.00	0.00	0.01	0.02	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	32.80	31.59	32.39	31.82	32.53	32.82	32.13	31.68	32.24	32.77
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Sum(Adj)	101.23	100.13	101.12	100.99	100.66	100.33	100.43	100.44	101.11	101.32
Si	2.93	2.96	2.95	2.94	2.94	2.94	2.93	2.99	2.96	2.96
Al	0.01	0.03	0.04	0.06	0.00	0.00	0.03	0.02	0.01	0.00
Z	2.95	2.99	2.99	3.00	2.94	2.94	2.96	3.00	2.97	2.96
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Fe+3	2.07	2.01	2.04	2.00	2.06	2.09	2.04	2.00	2.03	2.06
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.07	2.01	2.04	2.01	2.06	2.09	2.04	2.02	2.03	2.06
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Mg	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02
Ca	2.96	2.97	2.95	2.96	2.96	2.93	2.97	2.93	2.96	2.94
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.99	3.00	2.97	2.99	2.99	2.97	3.00	2.98	3.00	2.97
Ad	99.05	98.91	99.18	98.93	98.98	98.81	98.99	98.16	98.92	99.01
Uv	0.00	0.00	0.00	0.00	0.06	0.06	0.03	0.00	0.00	0.00
Py	0.72	0.79	0.57	0.62	0.68	0.84	0.73	0.66	0.73	0.72
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00
Sp	0.23	0.31	0.25	0.42	0.27	0.29	0.35	0.98	0.35	0.27
Gr	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00

76CB8 Garnet analyses

Grain	GA5-1	GA5-2
Point	r/CC	c
Optics	I/v	I/v
SiO2	34.91	35.16
Al2O3	0.75	1.50
FeO(T)	29.17	27.43
MgO	0.20	0.16
CaO	32.85	33.03
Na2O	0.02	0.00
TiO2	0.02	0.00
MnO	0.11	0.13
Cr2O3	0.02	0.01
Sum	98.02	97.42
K2O	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	32.41	30.47
FeO(c)	0.00	0.00
Sum(Adj)	101.26	100.46
Si	2.91	2.94
Al	0.07	0.06
Z	2.99	3.00
Al	0.00	0.09
Fe+3	2.04	1.92
Ti	0.00	0.00
Cr	0.00	0.00
Y	2.04	2.01
Fe+2	0.00	0.00
Mg	0.02	0.02
Ca	2.94	2.96
Mn	0.01	0.01
Na	0.00	0.00
X	2.97	2.99
Ad	98.88	94.84
Uv	0.06	0.03
Py	0.81	0.66
Al	0.00	0.00
Sp	0.25	0.30
Gr	0.00	4.16

76C89 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA1-6	GA1-7	GA1-8	GA1-9	GA1-10
Point	r	r	m	m	m	m	m	m	c	c
Optics	(A/pale v zoned rim)			(A/ darker v middle zone				)	(A/pale v complex core)	
SiO2	36.50	36.25	36.20	36.00	35.61	36.03	35.98	37.13	36.12	36.72
Al2O3	5.48	3.67	5.45	4.75	4.13	4.40	2.25	9.02	3.52	8.62
FeO(T)	22.56	25.00	22.59	24.44	24.45	24.42	26.80	18.93	25.48	19.07
MgO	0.14	0.12	0.15	0.17	0.17	0.13	0.14	0.14	0.15	0.14
CaO	33.90	33.86	33.96	33.74	33.23	33.13	33.04	34.11	33.15	33.73
Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.06	0.39	0.15	0.13	0.06	0.10	0.21
MnO	0.12	0.10	0.09	0.14	0.13	0.14	0.13	0.21	0.15	0.25
Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Sum	98.70	99.00	98.44	99.30	98.11	98.40	98.48	99.61	98.67	98.74
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	25.06	27.78	25.10	27.15	27.16	26.69	29.30	20.71	27.88	20.77
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.40	0.43	0.29	0.39	0.38
Sum(Adj)	101.20	101.78	100.95	102.01	100.82	101.07	101.41	101.68	101.46	100.81
Si	2.97	2.96	2.95	2.92	2.93	2.95	2.97	2.95	2.96	2.95
Al	0.03	0.04	0.05	0.08	0.07	0.05	0.03	0.05	0.04	0.05
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.49	0.31	0.47	0.38	0.33	0.38	0.19	0.80	0.30	0.77
Fe+3	1.53	1.71	1.54	1.66	1.68	1.65	1.82	1.24	1.72	1.26
Ti	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Y	2.02	2.02	2.01	2.04	2.04	2.04	2.02	2.04	2.03	2.04
Fe+2	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.02	0.03	0.03
Mg	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Ca	2.95	2.96	2.96	2.93	2.93	2.91	2.92	2.91	2.91	2.90
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.98	2.98	2.99	2.96	2.96	2.96	2.98	2.96	2.97	2.96
Ad	76.11	84.59	76.16	81.66	83.39	81.78	90.70	61.47	85.54	62.36
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00
Py	0.56	0.48	0.62	0.68	0.69	0.53	0.57	0.55	0.61	0.56
Al	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.63	0.88	0.84
Sp	0.27	0.23	0.21	0.32	0.30	0.32	0.30	0.47	0.35	0.56
Gr	23.06	14.70	23.04	17.35	15.61	16.47	7.41	36.85	12.62	35.68

76CB9 Garnet analyses

Grain	GA1-11	GA1-12
Point	c	c
Optics	A/pale v	I/y
SiO2	37.27	35.49
Al2O3	9.50	0.29
FeO(T)	18.19	29.27
MgO	0.15	0.16
CaO	33.90	32.65
Na2O	0.00	0.00
TiO2	0.03	0.00
MnO	0.23	0.10
Cr2O3	0.00	0.00
Sum	99.27	97.96
K2O	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	19.48	32.28
FeO(c)	0.66	0.22
Sum(Adj)	101.22	101.18
Si	2.97	2.97
Al	0.03	0.03
Z	3.00	3.00
Al	0.86	0.00
Fe+3	1.17	2.03
Ti	0.00	0.00
Cr	0.00	0.00
Y	2.03	2.03
Fe+2	0.04	0.02
Mg	0.02	0.02
Ca	2.89	2.93
Mn	0.02	0.01
Na	0.00	0.00
X	2.97	2.97
Ad	58.04	98.63
Uv	0.00	0.00
Py	0.59	0.65
Al	1.45	0.49
Sp	0.52	0.23
Gr	39.40	0.00

76CB10a Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA2-3	GA3-1	GA3-2
Point	r(2)	c(2)	r/PY(2)	c(2)	r	ir	r
Optics	A,zoned/c	I/c	A/c	I/c		A/c	A/c
						c GA3 replaced by EP,clav	
SiO2	36.08	35.66	36.51	35.46	35.88	36.78	36.77
Al2O3	5.14	0.12	3.85	0.05	3.71	6.41	4.10
FeO(T)	23.05	28.93	24.44	28.95	24.52	21.60	23.90
MgO	0.23	0.34	0.25	0.29	0.26	0.26	0.23
CaO	33.12	32.38	33.50	32.76	33.23	33.07	33.81
Na2O	0.01	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.01	0.00	0.00	0.00	0.03	0.01	0.07
MnO	0.33	0.19	0.24	0.16	0.25	0.36	0.27
Cr2O3	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Sum	97.97	97.52	98.80	97.67	97.88	98.49	98.16
K2O	0.02	0.01	0.00	0.02	0.03	0.01	0.01

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	25.61	31.64	27.10	32.16	27.24	23.12	25.10
FeO(c)	0.00	0.36	0.05	0.00	0.00	0.79	1.31
Sum(Adj)	100.53	100.68	101.51	100.88	100.60	100.80	100.67
Si	2.96	2.99	2.98	2.97	2.96	2.99	3.02
Al	0.04	0.01	0.02	0.00	0.04	0.01	0.00
Z	3.00	3.00	3.00	2.98	3.00	3.00	3.02
Al	0.46	0.01	0.35	0.00	0.32	0.60	0.40
Fe+3	1.58	2.00	1.67	2.03	1.69	1.41	1.55
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.04	2.01	2.02	2.03	2.01	2.01	1.95
Fe+2	0.00	0.02	0.00	0.00	0.00	0.05	0.09
Mg	0.03	0.04	0.03	0.04	0.03	0.03	0.03
Ca	2.91	2.91	2.93	2.94	2.94	2.88	2.89
Mn	0.02	0.01	0.02	0.01	0.02	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.96	2.99	2.98	2.99	2.99	2.99	3.03
Ad	78.41	97.77	82.99	98.46	83.91	70.46	78.00
Uv	0.00	0.02	0.03	0.02	0.00	0.00	0.03
Py	0.97	1.38	1.01	1.17	1.06	1.05	0.95
Al	0.00	0.01	0.11	0.00	0.00	1.79	3.02
Sc	0.75	0.44	3.55	0.37	0.58	0.82	0.63
Gr	19.90	0.00	15.71	0.00	14.45	25.88	17.37

76CB10b Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA2-1	GA2-2	GA3-1	GA3-2	GA3-3
Point	r	ir	c	c	r/Q	m	(2)c	ir	r/Q
Optics			altered core		A/c	A/c	I/c	A/c	A/c
SiO2	35.71	36.19	36.25	36.33	36.05	35.83	34.74	36.10	36.26
Al2O3	3.51	5.34	7.86	5.83	4.41	4.60	0.11	5.35	5.62
FeO(T)	23.65	21.85	17.94	20.31	22.88	22.11	27.78	21.55	20.97
MgO	0.22	0.22	0.25	0.20	0.22	0.22	0.36	0.26	0.22
CaO	33.87	34.00	34.68	34.41	34.20	33.69	33.00	33.81	33.85
Na2O	0.01	0.00	0.02	0.01	0.01	0.02	0.01	0.00	0.01
TiO2	0.00	0.00	0.26	0.35	0.00	0.00	0.00	0.15	0.00
MnO	0.23	0.37	0.31	0.37	0.26	0.22	0.30	0.24	0.26
Cr2O3	0.01	0.01	0.00	0.01	0.02	0.01	0.01	0.01	0.02
Sum	97.21	97.97	97.57	97.82	98.05	96.70	96.31	97.47	97.21
K2O	0.02	0.01	0.00	0.02	0.00	0.00	0.01	0.01	0.02

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	26.28	24.28	19.93	22.56	25.42	24.56	30.86	23.94	23.30
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	99.84	100.40	99.56	100.07	100.59	99.15	99.39	99.86	99.54
Si	2.96	2.96	2.94	2.97	2.95	2.97	2.95	2.97	2.98
Al	0.04	0.04	0.06	0.03	0.05	0.03	0.01	0.03	0.02
Z	3.00	3.00	3.00	3.00	3.00	3.00	2.96	3.00	3.00
Al	0.30	0.47	0.70	0.53	0.38	0.42	0.00	0.48	0.53
Fe+3	1.64	1.49	1.22	1.39	1.57	1.53	1.97	1.48	1.44
Ti	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.95	1.97	1.93	1.94	1.95	1.94	1.97	1.97	1.97
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.03	0.03	0.02	0.03	0.03	0.05	0.03	0.03
Ca	3.01	2.98	3.02	3.01	3.00	3.00	3.00	2.98	2.98
Mn	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.05	3.03	3.07	3.06	3.05	3.04	3.07	3.03	3.03
Ad	81.39	74.09	60.42	69.20	77.71	76.35	97.57	73.66	71.86
Uv	0.03	0.03	0.00	0.03	0.06	0.03	0.03	0.03	0.06
Py	0.90	0.89	1.00	0.81	0.89	0.90	1.51	1.06	0.90
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.54	0.85	0.71	0.85	0.60	0.51	0.71	0.56	0.60
Gr	17.14	24.14	37.87	29.10	20.73	22.20	0.18	24.70	26.57

76CB10c Garnet analyses

Grain	GA1-1	GA1-1	GA1-2	GA2-1	GA2-2	GA3-1	GA3-2	GA4-1	GA4-2	GA4-3
Point	r/Q	r/Q	(2)c	2)r/PY	(2)c	r	r	(2)c	(2)r	(2)oc
Optics	<			A/c			>	I/c	A/c	I/c
SiO2	35.75	36.23	36.04	35.73	36.02	35.99	35.88	34.97	36.09	35.30
Al2O3	4.01	5.77	4.52	4.53	4.55	5.66	3.28	0.11	3.57	1.25
FeO(T)	23.53	21.67	23.44	22.36	22.61	21.37	23.83	27.65	24.14	26.52
MgO	0.15	0.19	0.25	0.19	0.25	0.23	0.24	0.31	0.21	0.31
CaO	33.91	33.96	34.18	34.12	33.97	34.02	33.54	33.22	33.47	33.24
Na2O	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.02
TiO2	0.00	0.00	0.01	0.42	0.02	0.15	0.00	0.00	0.00	0.00
MnO	0.71	0.26	0.21	0.22	0.23	0.29	0.23	0.03	0.29	0.24
Cr2O3	0.00	0.00	0.02	0.02	0.00	0.03	0.02	0.02	0.01	0.01
Sum	97.67	98.09	97.68	97.60	97.66	97.74	97.02	96.52	97.59	96.89
K2O	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	26.14	24.08	24.93	24.84	25.12	23.74	26.48	30.72	26.82	29.46
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.28	100.50	100.17	100.08	100.17	100.11	99.67	99.59	100.27	99.83
Si	2.95	2.96	2.96	2.94	2.96	2.95	2.98	2.96	2.99	2.96
Al	0.05	0.04	0.04	0.06	0.04	0.05	0.02	0.01	0.01	0.04
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.97	3.00	3.00
Al	0.34	0.51	0.40	0.38	0.40	0.49	0.31	0.00	0.31	0.09
Fe+3	1.62	1.46	1.54	1.54	1.55	1.46	1.66	1.96	1.67	1.86
Ti	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.96	1.99	1.94	1.95	1.96	1.97	1.96	1.96	1.99	1.95
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.02	0.03	0.02	0.03	0.03	0.03	0.04	0.03	0.04
Ca	3.00	2.97	3.01	3.01	2.99	2.98	2.99	3.01	2.97	2.99
Mn	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.04	3.01	3.06	3.05	3.04	3.03	3.04	3.07	3.01	3.05
Ad	80.33	73.28	76.54	76.52	77.18	72.51	82.61	97.11	83.28	92.48
Uv	0.00	0.00	0.06	0.06	0.00	0.10	0.07	0.07	0.03	0.03
Py	0.61	0.77	1.02	0.77	1.02	0.93	0.99	1.30	0.86	1.29
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.72	0.60	0.48	0.51	0.53	0.67	0.54	0.55	0.68	0.57
Gr	18.34	25.36	21.90	22.14	21.28	25.80	15.80	0.98	15.15	5.63

76CB10c Garnet analyses

Grain	GA4-4
Point	(2)c
Optics	A/c
SiO2	35.79
Al2O3	3.84
FeO(T)	23.33
MgO	0.21
CaO	33.60
Na2O	0.01
TiO2	0.00
MnO	0.21
Cr2O3	0.02
Sum	97.01
K2O	0.01

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	25.92
FeO(c)	0.00
Sum(Adj)	99.60
Si	2.97
Al	0.03
Z	3.00
Al	0.35
Fe+3	1.62
Ti	0.00
Cr	0.00
Y	1.97
Fe+2	0.00
Mg	0.03
Ca	2.99
Mn	0.01
Na	0.00
X	3.03
Ad	80.55
Uv	0.07
Py	0.86
Al	0.00
Sp	0.49
Gr	18.04

76CB11 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA2-3	GA3-1	GA3-1'	GA3-2
Point	r/PY(2)	c(2)	r/GA1	r/PY	c/CH1	c	c	r(2)
Optics	<			A/c				>
SiO2	36.00	36.00	36.86	36.66	37.27	36.79	37.09	36.91
Al2O3	7.17	4.41	8.15	11.05	11.70	10.05	11.55	11.40
FeO(T)	19.69	22.93	18.97	14.94	14.23	16.27	14.23	14.29
MgO	0.22	0.21	0.21	0.20	0.27	0.22	0.18	0.22
CaO	34.09	33.82	33.77	34.78	34.54	34.71	34.52	34.47
Na2O	0.02	0.00	0.01	0.01	0.01	0.02	0.02	0.01
TiO2	0.36	0.06	0.17	0.82	0.38	0.38	0.27	0.76
MnO	0.52	0.30	0.63	0.52	0.68	0.56	0.60	0.62
Cr2O3	0.01	0.01	0.00	0.00	0.02	0.00	0.01	0.02
Sum	98.08	97.74	98.77	98.99	99.10	99.00	98.47	98.70
K2O	0.00	0.00	0.02	0.02	0.00	0.02	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	21.98	25.48	21.08	16.60	15.81	18.08	15.81	15.88
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.27	100.29	100.88	100.65	100.68	100.91	100.05	100.29
Si	2.92	2.96	2.96	2.91	2.94	2.93	2.95	2.93
Al	0.08	0.04	0.04	0.09	0.06	0.07	0.05	0.07
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.61	0.39	0.74	0.94	1.03	0.87	1.03	1.00
Fe+3	1.34	1.58	1.28	0.99	0.94	1.08	0.95	0.95
Ti	0.02	0.00	0.01	0.05	0.02	0.02	0.02	0.05
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.97	1.97	2.02	1.98	2.00	1.97	1.99	2.00
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.03	0.03	0.02	0.03	0.03	0.02	0.03
Ca	2.97	2.98	2.91	2.96	2.92	2.96	2.94	2.93
Mn	0.04	0.02	0.04	0.03	0.05	0.04	0.04	0.04
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.03	2.98	3.02	3.00	3.03	3.01	3.00
Ad	66.15	78.33	63.44	49.15	46.70	53.60	47.00	47.27
Uv	0.03	0.03	0.00	0.00	0.06	0.00	0.03	0.06
Py	0.88	0.85	0.84	0.78	1.06	0.86	0.71	0.87
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	1.18	0.69	1.43	1.16	1.51	1.25	1.34	1.39
Gr	31.76	20.09	34.30	48.91	50.68	44.29	50.92	50.42

B50H107 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA1-6	GA1-7	GA1-8	GA2-1	GA2-2
Point	c	oc						r	c	r/PY
Ontics	(Traverse perpendicular to growth bands; fine-scale							and I/ c and y zoning)	I/c	A/zoned
SiO2	35.45	35.95	35.84	35.3	35.46	35.55	36.30	38.16	35.14	36.94
Al2O3	0.30	1.24	[illegible]	0.05	0.00	1.01	4.03	5.05	0.13	8.43
Fe	28.77	26.07	28.39	28.54	28.54	27.18	23.46	21.15	28.10	16.67
MgO	3.07	0.11	0.05	0.07	0.06	0.21	0.14	1.43	0.24	0.36
CaO	34.58	34.73	34.43	33.65	33.97	34.27	34.57	34.16	34.11	36.21
Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
TiO2	0.01	0.00	0.00	0.00	0.00	0.00	0.04	0.78	0.00	1.47
MnO	0.09	0.23	0.19	0.21	0.22	0.19	0.22	0.29	0.22	0.04
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.60	98.75	98.49	98.15	98.25	98.41	98.76	101.03	97.94	100.12
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
F	0.00	0.00	0.00	0.01	0.04	0.05	0.06	0.08	0.03	0.00
Cl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00
SO3	0.02	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	31.52	28.96	31.54	31.71	31.7	30.20	26.06	23.50	31.22	18.52
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.75	101.64	101.64	101.32	101.42	101.42	101.36	101.38	101.06	101.77
Si	2.94	2.92	2.94	2.97	2.96	2.94	2.96	3.01	2.97	2.91
Al	0.02	0.06	0.01	0.00	0.00	0.06	0.04	0.00	0.01	0.09
T	2.94	2.98	2.94	2.98	2.96	3.00	3.00	3.01	2.94	3.00
Al	0.00	0.12	0.00	0.00	0.00	0.04	0.35	0.47	0.00	0.70
Fe+3	1.97	1.77	1.94	1.99	1.99	1.88	1.60	1.40	1.96	1.10
Ti	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.09
Z	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[illegible]	1.97	1.91	1.97	1.99	1.99	1.92	1.95	1.91	1.96	1.89
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Mg	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.17	0.03	0.04
Ca	3.07	3.06	3.06	3.01	3.03	3.04	3.02	2.89	3.05	3.06
Mn	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	3.09	3.09	3.08	3.03	3.06	3.08	3.05	3.09	3.09	3.11
Ad	97.30	88.18	97.36	99.00	98.54	92.97	79.34	70.60	96.70	55.09
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.29	0.44	0.20	0.29	0.25	0.86	2.56	5.68	0.98	1.42
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	2.19	0.53	0.44	0.49	0.51	0.44	0.50	0.66	0.51	0.09
Gr	0.23	10.85	1.99	0.22	0.70	5.74	19.59	23.06	1.81	43.40

85JH107 Garnet analyses

Grain	GA3-1	GA3-2
Point	r/O	
Optics	A/c	/c
SiO2	37.17	35.90
Al2O3	7.58	7.88
FeO(T)	19.23	23.74
MgO	0.82	0.88
CaO	35.41	35.19
Na2O	0.01	0.00
TiO2	0.14	0.12
MnO	0.14	0.24
Cr2O3	n.d.	n.d.
Sum	99.70	99.15
K2O	0.00	0.00
P	0.01	0.11
Cl	0.00	0.00
SO3	0.00	0.04
Formula basis = 8 cations, 12 oxygens		
Fe2O3(c)	21.36	26.39
FeO(c)	0.00	0.00
Sum(Adj)	101.83	101.79
Si	2.96	2.91
Al	0.04	0.09
Z	3.00	3.00
Al	0.67	0.29
Fe-3	1.38	1.61
Ti	0.01	0.01
Cr	0.00	0.00	
	1.96	1.91
Fe+2	0.00	0.00
Mg	0.00	0.01
Ca	3.02	3.06
Mn	0.01	0.02
Na	0.00	0.00
X	3.04	3.09
Ad	67.69	79.45
Gr	0.00	0.00
Py	0.00	0.00
Al	0.01	0.00
Sp	0.01	0.54
Gr	75.91	19.68

85JH112 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA3-1	GA3-2	GA4-1	GA4-2	GA5-1	GA5-2
Area	(2)r	c	r	c	r	c	r	c	r	c
Optics	A/c	I/vb	A/c	I/vb	A/c	I/vb	A/c	I/yb	A/c	I/vb
SiO2	35.96	35.82	35.81	35.79	36.05	35.96	36.41	36.00	36.41	35.97
Al2O3	6.05	5.52	5.41	5.89	6.79	7.03	10.26	8.53	11.13	6.52
FeO(T)	21.14	21.72	22.13	20.89	20.32	19.45	16.51	16.63	15.49	20.60
MgO	0.13	0.19	0.11	0.20	0.07	0.19	0.08	0.24	0.08	0.13
CaO	33.75	33.87	33.76	33.94	33.94	33.83	33.98	34.83	34.17	34.19
Na2O	0.02	0.03	0.02	0.01	0.02	0.01	0.01	0.03	0.01	0.03
TiO2	0.20	0.35	0.12	0.31	0.10	0.34	0.07	1.06	0.13	0.57
MnO	0.25	0.22	0.21	0.23	0.19	0.20	0.39	0.17	0.34	0.21
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.50	97.72	97.57	97.26	97.54	97.01	97.71	97.49	97.76	98.27
K2O	0.01	0.00	0.01	0.00	0.01	0.02	0.02	0.03	0.01	0.01
F	0.02	0.03	0.00	0.03	0.00	0.15	0.10	0.38	0.05	0.11
Cl	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01	0.03
SO3	0.03	0.02	0.05	0.02	0.05	0.02	0.01	0.04	0.04	0.09
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	23.49	24.13	24.59	23.21	22.64	21.61	18.34	18.48	17.21	22.89
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	99.55	100.13	100.03	99.52	99.80	99.17	99.54	99.34	99.48	100.04
Si	2.95	2.94	2.94	2.94	2.95	2.95	2.94	2.92	2.92	2.92
Al	0.05	0.06	0.06	0.06	0.05	0.05	0.06	0.08	0.08	0.08
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.53	0.47	0.47	0.51	0.60	0.63	0.91	0.74	0.99	0.55
Fe+3	1.45	1.49	1.52	1.44	1.39	1.33	1.11	1.13	1.04	1.40
Ti	0.01	0.02	0.01	0.02	0.01	0.02	0.03	0.06	0.01	0.03
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.00	1.98	2.00	1.97	2.00	1.99	2.03	1.93	2.03	1.98
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.03	0.01	0.02
Ca	2.97	2.99	2.97	2.99	2.97	2.97	2.94	3.03	2.94	2.98
Mn	0.02	0.02	0.01	0.02	0.01	0.01	0.03	0.01	0.02	0.01
Na	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.00	3.01	3.01	3.03	3.00	3.01	2.97	3.07	2.97	3.02
Ad	71.94	73.90	75.34	71.27	69.07	66.37	54.99	56.26	51.32	69.46
Jv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.51	0.77	0.45	0.81	0.28	0.77	0.32	0.97	0.32	0.72
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.58	0.51	0.48	0.53	0.44	0.46	0.88	0.39	0.76	0.48
Gr	26.98	24.82	23.73	27.39	30.22	32.39	43.82	42.38	47.61	29.34

95JH112 Garnet analyses

Grain	GA6-1	GA6-2	GA6-3	GA6-4	GA6-5	GA6-6	GA6-7
Area	r	Traverse from rim towards core				c	c
Optics	A/c	A/c	I/v	I/v	A/c	I/v	I/v
SiO2	36.01	36.39	34.20	33.76	34.76	33.68	34.49
Al2O3	7.69	10.20	0.22	0.05	4.45	0.72	1.62
FeO(T)	19.40	16.58	28.11	28.45	23.22	27.85	26.54
MgO	0.06	0.09	0.30	0.22	0.10	0.11	0.20
CaO	34.43	33.98	32.72	32.69	33.27	32.74	32.73
Na2O	0.01	0.02	0.07	0.04	0.03	0.01	0.01
TiO2	0.02	0.15	0.01	0.01	0.02	0.02	0.03
MnO	0.14	0.36	0.22	0.23	0.20	0.29	0.24
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.76	97.77	95.81	95.45	96.05	95.42	95.86
K2O	0.02	0.00	0.01	0.01	0.01	0.00	0.00
F	0.09	0.09	0.02	0.05	0.10	0.21	0.07
Cl	0.00	0.01	0.01	0.01	0.02	0.00	0.00
SO3	0.03	0.07	0.10	0.08	0.02	0.01	0.03
Formula basis = 8 cations, 12 oxygens							
Fe2O3(c)	21.55	18.42	31.23	31.61	25.80	30.94	29.49
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	99.91	99.61	98.93	98.61	98.63	98.51	98.81
Si	2.93	2.93	2.92	2.90	2.91	2.89	2.93
Al	0.07	0.07	0.02	0.01	0.09	0.07	0.07
Z	3.00	3.00	2.94	2.90	3.00	2.96	3.00
Al	0.66	0.90	0.00	0.00	0.35	0.00	0.09
Fe+3	1.32	1.12	2.01	2.04	1.63	2.00	1.88
Ti	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.98	2.03	2.01	2.04	1.98	2.00	1.98
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.01	0.04	0.03	0.01	0.01	0.03
Ca	3.00	2.93	2.99	3.01	2.99	3.01	2.98
Mn	0.01	0.02	0.02	0.02	0.01	0.02	0.02
Na	0.00	0.00	0.00	0.01	0.00	0.00	0.00
X	3.02	2.97	3.05	3.06	3.02	3.04	3.02
Ad	65.00	55.24	98.23	98.55	80.05	97.63	92.97
Uv	0.00	2.00	0.00	0.00	0.00	0.30	0.00
Py	0.24	0.36	1.25	0.91	0.41	0.46	0.83
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.32	0.81	0.52	0.54	0.47	0.69	0.57
Gr	34.43	43.59	0.00	0.00	19.07	1.22	5.63

85JM113 Garnet analyses

Grain	GA1	GA2	GA3-1	GA3-2	GA3-3	GA3-2	GA3-5	GA3-6
Area	c	c	r	Traverse across zoned garnet			c	c
Optics	A/c	A/c	A/c	I/y	A/c	I/y	/c	
SiO2	34.83	35.25	35.36	35.21	34.51	34.51	34.45	35.56
Al2O3	5.65	4.79	3.75	6.37	1.29	1.38	4.22	6.63
FeO(T)	21.31	22.26	23.77	20.73	26.68	26.67	23.11	20.22
MgO	0.16	0.12	0.10	0.18	0.25	0.17	0.26	0.19
CaO	33.27	33.30	32.77	33.88	32.91	32.73	32.95	33.57
Na2O	0.01	0.03	0.01	0.01	0.03	0.01	0.03	0.02
TiO2	0.29	0.25	0.08	0.10	0.02	0.02	0.07	0.25
MnO	0.20	0.19	0.18	0.04	0.05	0.08	0.26	0.26
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	95.72	96.19	96.02	96.52	95.74	95.57	95.35	96.66
K2O	0.01	0.02	0.01	0.00	0.00	0.00	0.01	0.02
F	0.02	0.07	0.07	0.00	0.03	0.04	0.13	0.15
Cl	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.03
BO3	0.06	0.04	0.01	0.15	0.05	0.04	0.04	0.04
Formula basis = 5 cations, 12 oxygens								
Fe2O3(c)	23.68	24.73	26.41	23.03	29.64	29.63	25.68	22.46
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	98.09	98.66	98.66	98.82	98.70	98.53	97.92	98.90
Si	2.91	2.94	2.97	2.91	2.93	2.94	2.91	2.93
Al	0.09	0.06	0.03	0.09	0.07	0.06	0.09	0.07
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.47	0.42	0.34	0.53	0.06	0.08	0.33	0.58
Fe+3	1.49	1.55	1.67	1.43	1.90	1.90	1.63	1.40
Ti	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.98	1.99	2.02	1.97	1.96	1.98	1.96	1.99
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.01	0.01	0.02	0.03	0.02	0.03	0.02
Ca	2.98	2.98	2.95	3.00	3.00	2.99	2.98	2.96
Mn	0.01	0.01	0.01	0.00	0.00	0.01	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.02	3.01	2.98	3.03	3.04	3.02	3.04	3.01
Ad	73.58	77.19	83.21	70.52	93.72	93.98	80.23	69.11
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.66	0.50	0.42	0.77	1.05	0.71	1.07	0.77
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.47	0.45	0.43	0.09	0.12	0.19	0.61	0.60
Gr	25.29	21.87	15.95	28.66	5.12	5.12	18.09	29.51

B5JH114 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2	GA2-3	GA3-1	GA3-2
Point	c	r	c	r	c	c	r
Optics	< A I zoned /c >		altered	A/c	altered	I/c	A/c
SiO2	35.84	36.05	36.27	36.51	36.31	35.35	36.53
Al2O3	3.18	4.98	10.96	5.27	4.96	1.22	4.80
FeO(T)	24.15	22.26	15.25	22.01	22.31	26.58	22.53
MgO	0.20	0.12	0.11	0.00	0.05	0.08	0.06
CaO	34.71	34.91	35.06	35.02	34.93	33.88	34.64
Na2O	0.00	0.00	0.01	0.00	0.00	0.00	0.00
TiO2	0.42	0.30	0.04	0.22	0.18	1.11	0.06
MnO	0.25	0.14	0.00	0.11	0.17	0.42	0.18
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	98.75	98.76	97.70	99.14	98.81	98.64	98.80
K2O	0.00	0.00	0.02	0.00	0.00	0.00	0.00
F	0.05	0.00	0.06	0.00	0.00	0.22	0.03
Cl	0.00	0.00	0.01	0.00	0.01	0.00	0.00
SO3	0.02	0.03	2.30	0.01	0.00	0.00	0.01
Formula basis = 8 cations, 12 oxygens							
Fe2O3(c)	26.83	24.73	16.94	24.45	24.79	29.53	25.03
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.43	101.23	99.39	101.58	101.29	101.59	101.30
Si	2.93	2.93	2.91	2.95	2.95	2.93	2.97
Al	0.07	0.07	0.09	0.05	0.05	0.07	0.03
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.24	0.41	0.95	0.46	0.42	0.05	0.43
Fe+3	1.65	1.51	1.02	1.49	1.52	1.84	1.53
Ti	0.03	0.02	0.00	0.01	0.01	0.07	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.92	1.94	1.97	1.96	1.94	1.95	1.96
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.01	0.01	0.00	0.01	0.01	0.01
Ca	3.04	3.04	3.01	3.04	3.04	3.01	3.02
Mn	0.02	0.01	0.00	0.01	0.01	0.03	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.08	3.06	3.03	3.04	3.06	3.05	3.04
Ad	81.89	74.82	50.27	73.92	75.18	91.92	76.13
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.81	0.46	0.43	0.00	0.20	0.33	0.24
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.57	0.32	0.00	0.25	0.39	0.98	0.41
Gr	16.73	24.38	49.29	25.83	24.23	6.76	23.21

B5JH125 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	A1-4	GA2-1	GA2-2	GA2-3	GA2-4
Area	r	mid r	ir	oc	r/CC			c
Optics	A/c	A/c	A/c	I/v				I/v
SiO2	36.55	35.95	36.13	33.89	36.62	36.32	33.59	34.31
Al2O3	10.20	9.17	9.46	0.12	14.15	10.29	0.34	0.06
FeO(T)	16.40	18.77	18.51	28.67	10.91	16.43	28.26	28.86
MgO	0.08	0.08	0.06	0.02	0.10	0.08	0.01	0.02
CaO	33.92	33.78	33.65	32.54	34.77	34.22	32.51	32.36
Na2O	0.02	0.01	0.02	0.03	0.01	0.02	0.03	0.02
TiO2	0.07	0.02	0.02	0.03	0.52	0.09	0.02	0.00
MnO	0.36	0.32	0.32	0.20	0.30	0.36	0.19	0.16
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.60	97.10	97.17	95.50	97.38	97.81	94.94	95.81
K2O	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
F	0.08	0.18	0.20	0.14	0.07	0.14	0.20	0.18
Cl	0.02	0.00	0.00	0.00	0.01	0.00	0.02	0.00
SO3	0.08	0.03	0.02	0.03	0.02	0.08	0.02	0.08
Formula basis = 8 cations, 12 oxygens								
Fe2O3(c)	18.22	20.85	20.56	31.85	12.12	18.25	31.40	32.06
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	99.42	99.18	99.22	98.68	98.59	99.63	98.08	99.01
Si	2.95	2.94	2.95	2.91	2.92	2.92	2.90	2.94
Al	0.05	0.06	0.05	0.01	0.08	0.08	0.03	0.01
Z	3.00	3.00	3.00	2.92	3.00	3.00	2.93	2.94
Al	0.92	0.72	0.76	0.00	1.24	0.90	0.00	0.00
Fe+3	1.11	1.28	1.26	2.06	0.73	1.11	2.04	2.07
Ti	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.03	2.01	2.03	2.06	2.00	2.01	2.04	2.07
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00
Ca	2.93	2.96	2.94	2.99	2.97	2.95	3.01	2.97
Mn	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
X	2.97	2.99	2.97	3.02	3.00	2.99	3.03	2.99
Ad	54.84	63.37	62.54	99.45	35.93	54.55	99.53	99.58
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.32	0.32	0.24	0.00	0.39	0.32	0.04	0.00
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.81	0.73	0.77	0.47	0.67	0.81	0.43	0.42
Gr	44.03	35.58	36.49	0.00	63.01	44.33	0.00	0.00

85JH126 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4
Area	c	oc	ir	r
Optics	I/r	I/r	A/c	A/c
SiO2	34.29	34.01	34.83	36.03
Al2O3	0.04	0.15	3.35	11.69
FeO(T)	29.52	28.70	24.56	14.35
MgO	0.02	0.01	0.06	0.09
CaO	32.32	32.26	33.08	33.56
Na2O	0.02	0.02	0.04	0.01
TiO2	0.02	0.03	0.46	1.19
MnO	0.21	0.27	0.17	0.39
Cr2O3	n.d.	n.d.	n.d.	n.d.
Sum	96.44	95.45	96.55	97.31
K2O	0.00	0.01	0.01	0.01
F	0.05	0.02	0.08	0.13
Cl	0.01	0.00	0.01	0.00
SO3	0.02	0.00	0.04	0.00
Formula basis = 8 cations, 12 oxygens				
Fe2O3(c)	32.80	31.89	27.29	15.33
FeO(c)	0.00	0.00	0.00	0.55
Sum(Adj)	99.72	98.64	99.28	98.84
Si	2.92	2.92	2.92	2.91
Al	0.00	0.02	0.08	0.09
Z	2.92	2.94	3.00	3.00
Al	0.00	0.00	0.25	1.02
Fe+3	2.10	2.06	1.72	0.93
Ti	0.00	0.00	0.03	0.07
Cr	0.00	0.00	0.00	0.00
Y	2.10	2.06	2.00	2.02
Fe+2	0.00	0.00	0.00	0.04
Mg	0.00	0.00	0.01	0.01
Ca	2.95	2.97	2.97	2.90
Mn	0.02	0.02	0.01	0.03
Na	0.00	0.00	0.01	0.00
X	2.97	3.00	3.00	2.99
Ad	99.44	99.33	85.37	46.37
Uv	0.00	0.00	0.00	0.00
Py	0.08	0.04	0.25	0.36
Al	0.00	0.00	0.00	1.24
Sp	0.48	0.63	0.40	0.89
Gr	0.00	0.00	14.02	51.14

85JH129 Garnet analyses

Grain	GA1	GA2	GA3-1	GA3-2	GA3-3	GA4-1	GA4-2	GA4-3	GA4-4	GA4-5
Area			r/PY	c	r/PY	r/PY	m	m		c
Optics	r/I	r/I	r/I	r/I	r/I	I/r				
SiO2	36.95	36.94	36.43	36.74	36.87	37.36	37.19	37.12	36.91	36.59
Al2O3	10.93	13.04	7.92	12.90	8.28	8.58	9.42	11.39	9.02	12.25
FeO(T)	14.75	11.84	19.17	11.05	17.71	18.77	17.82	15.56	18.20	13.01
MgO	0.08	0.09	0.00	0.16	0.06	0.05	0.13	0.09	0.08	0.21
CaO	33.85	34.34	32.65	34.12	33.96	34.23	34.24	34.22	34.00	34.78
Na2O	0.01	0.01	0.01	0.02	0.01	0.02	0.00	0.02	0.01	0.02
TiO2	0.20	0.37	0.47	2.17	0.28	0.09	0.30	1.24	0.55	2.21
MnO	0.66	0.68	0.73	0.65	0.58	0.59	0.76	0.99	0.78	0.56
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.43	98.11	97.38	97.81	97.75	99.69	99.86	100.63	99.55	99.63

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	16.24	13.15	19.78	11.02	19.58	20.72	19.80	16.84	20.12	14.29
FeO(c)	0.14	0.00	1.37	1.13	0.09	0.12	0.00	0.40	0.09	0.14
Sum(Adj)	99.05	99.42	99.36	98.91	99.71	101.76	101.84	102.31	101.56	101.86
Si	2.98	2.93	2.98	2.93	2.99	2.97	2.95	2.91	2.94	2.88
Al	0.02	0.07	0.02	0.07	0.01	0.03	0.05	0.09	0.06	0.12
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	1.02	1.22	0.74	1.15	0.78	0.78	0.83	0.96	0.79	1.02
Fe+3	0.99	0.78	1.22	0.66	1.20	1.24	1.18	0.99	1.21	0.85
Ti	0.01	0.02	0.02	0.13	0.02	0.01	0.02	0.07	0.03	0.13
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.01	2.03	1.99	1.94	1.99	2.02	2.03	2.02	2.03	1.99
Fe+2	0.01	0.00	0.09	0.08	0.01	0.01	0.00	0.02	0.01	0.01
Mg	0.01	0.01	0.00	0.02	0.01	0.01	0.02	0.01	0.01	0.02
Ca	2.92	2.92	2.86	2.92	2.95	2.92	2.91	2.87	2.90	2.93
Mn	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.07	0.05	0.04
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	2.99	2.97	3.01	3.06	3.01	2.98	2.97	2.98	2.97	3.01
Ad	49.15	38.84	61.05	33.56	59.87	61.84	59.63	49.46	60.05	42.45
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pv	0.32	0.35	0.00	0.64	0.24	0.20	0.51	0.35	0.32	0.82
Al	0.30	0.00	3.13	2.56	0.20	0.26	0.00	0.87	0.20	0.32
Sp	1.50	1.51	1.69	1.49	1.33	1.32	1.69	2.19	1.75	1.25
Gr	48.72	59.30	34.12	61.75	38.35	36.38	39.17	47.13	37.69	55.16

B5JH129 Garnet analyses

Grain	GA4-6	GA4-7	GA4-8	GA4-9	GA4-10	GA4-11	GA4-12	GA4-13
Area	m	r/GA						
Optics	I/r	I/r	0*	20	40	60	80	100
SiO2	37.64	36.50	36.80	36.94	37.13	37.81	37.34	37.36
Al2O3	10.84	7.24	8.75	8.03	6.08	10.26	8.42	8.22
FeO(T)	14.97	21.76	19.40	19.84	19.90	17.50	18.91	19.20
MgO	0.21	0.08	0.07	0.04	0.08	0.06	0.08	0.06
CaO	34.36	32.93	33.80	33.99	34.05	34.35	34.58	34.63
Na2O	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.00
TiO2	2.02	0.42	0.41	0.39	0.13	0.34	0.36	0.20
MnO	0.61	0.86	0.90	0.74	0.75	0.74	0.49	0.60
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	100.86	99.31	100.14	99.98	100.13	101.07	100.18	100.27

* Traverse across zoned rim of garnet in 20 micron steps from inner rim (closest to core) towards outer rim

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	14.96	23.37	21.55	21.93	22.11	18.77	20.98	21.33
FeO(c)	1.51	0.72	0.00	0.10	0.00	0.60	0.03	0.00
Sum(Adj)	102.35	102.14	102.29	102.17	102.34	102.95	102.28	102.40
Si	2.94	2.93	2.92	2.94	2.95	2.96	2.96	2.96
Al	0.06	0.07	0.08	0.06	0.05	0.04	0.04	0.04
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.94	0.61	0.74	0.70	0.71	0.90	0.75	0.73
Fe+3	0.88	1.41	1.29	1.31	1.32	1.10	1.25	1.27
Ti	0.12	0.03	0.02	0.02	0.01	0.02	0.02	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	2.05	2.05	2.04	2.04	2.03	2.02	2.01
Fe+2	0.10	0.05	0.00	0.01	0.00	0.04	0.00	0.00
Mg	0.02	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Ca	2.89	2.83	2.88	2.90	2.90	2.88	2.94	2.94
Mn	0.04	0.06	0.06	0.05	0.05	0.05	0.03	0.04
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.06	2.95	2.95	2.96	2.96	2.97	2.98	2.99
Ad	44.57	69.96	63.74	65.32	65.60	54.98	62.34	63.25
Gv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.63	0.32	0.27	0.16	0.31	0.23	0.31	0.24
Al	3.33	1.61	0.00	0.23	0.00	1.31	0.86	0.00
Sp	1.37	1.94	2.00	1.66	1.67	1.63	1.09	1.34
Gr	49.91	26.18	33.99	32.63	32.41	41.85	36.19	35.18

Skarn E samples

85JH140

85JH143

85JH145

85JH140 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2
Point			r/CC	c
Optics	<	A/c		>
SiO2	34.69	34.66	35.05	35.04
Al2O3	0.11	0.10	2.16	0.00
FeO(T)	27.49	27.92	25.67	28.10
MgO	0.06	0.02	0.01	0.05
CaO	34.46	34.67	34.87	34.01
Na2O	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.00
MnO	0.11	0.12	0.09	0.11
Cr2O3	n.d.	n.d.	n.d.	n.d.
Sum	96.92	97.49	97.85	97.31
K2O	0.00	0.00	0.00	0.00
F	0.13	0.07	0.06	0.05
Cl	0.00	0.00	0.00	0.00
SO3	0.03	0.00	0.00	0.00

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	30.54	31.02	28.52	31.22
FeO(c)	0.00	0.00	0.00	0.00
Sum(Adj)	99.97	100.59	100.70	100.43
Si	2.92	2.91	2.91	2.95
Al	0.01	0.01	0.09	0.00
Z	2.93	2.92	3.00	2.95
Al	0.00	0.00	0.12	0.00
Fe+3	1.94	1.96	1.78	1.98
Ti	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00
Y	1.94	1.96	1.90	1.98
Fe+2	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.00	0.01
Ca	3.11	3.12	3.10	3.06
Mn	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00
X	3.13	3.13	3.10	3.08
Ad	95.41	96.08	87.30	97.72
Uv	0.00	0.00	0.00	0.00
Py	0.25	0.08	0.04	0.21
Al	0.00	0.00	0.00	0.00
Sp	0.26	0.28	0.21	0.26
Gr	4.08	3.56	12.46	1.81

85JH143 Garnet analyses

Grain	GA1-1	GA1-2	GA2-1	GA2-2
Point	c(2)	r	c	r
Optics	<	A/c		>
SiO2	36.92	37.40	37.16	37.23
Al2O3	13.54	11.78	14.58	10.95
FeO(T)	11.44	13.39	9.78	14.18
MgO	0.15	0.09	0.23	0.09
CaO	36.83	36.51	37.16	36.59
Na2O	0.01	0.00	0.00	0.00
TiO2	0.34	0.66	0.88	0.76
MnO	0.24	0.23	0.25	0.15
Cr2O3	n.d.	n.d.	n.d.	n.d.
Sum	99.47	100.06	100.04	99.95
K2O	0.00	0.00	0.00	0.00
F	0.63	0.36	0.62	0.28
Cl	0.01	0.00	0.00	0.00
SO3	0.00	0.01	0.02	0.06
Formula basis = 8 cations, 12 oxygens				
Fe2O3(c)	12.71	14.88	10.87	15.75
FeO(c)	0.00	0.00	0.00	0.00
Sum(Adj)	100.74	101.55	101.13	101.52
Si	2.88	2.92	2.87	2.92
Al	0.12	0.08	0.13	0.08
Z	3.00	3.00	3.00	3.00
Al	1.12	1.01	1.20	0.93
Fe+3	0.75	0.87	0.63	0.93
Ti	0.02	0.04	0.05	0.04
Cr	0.00	0.00	0.00	0.00
Y	1.89	1.92	1.88	1.91
Fe+2	0.00	0.00	0.00	0.00
Mg	0.02	0.01	0.03	0.01
Ca	3.08	3.06	3.08	3.07
Mn	0.02	0.02	0.02	0.01
Na	0.00	0.00	0.00	0.00
X	3.11	3.08	3.12	3.09
Ad	36.55	43.37	31.10	46.14
Uv	0.00	0.00	0.00	0.00
Py	0.57	0.35	0.87	0.35
Al	0.00	0.00	0.00	0.00
Sp	0.52	0.50	0.54	0.33
Gr	62.36	55.78	67.49	53.18

B5JH145 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA2-1	GA2-2	GA3-1	GA3-2	GA3-3	GA3-4
Point	r/Q	ir	oc	c	r	c	r/Q	ir	oc	c
Optics	<		A/c	>	A/c	I/c	<		A/c	>
SiO2	36.27	36.22	37.28	35.77	36.31	35.41	36.75	36.28	36.98	35.83
Al2O3	3.92	4.79	8.70	1.23	6.29	0.52	5.48	3.92	7.36	1.09
FeO(T)	22.82	20.82	17.61	26.97	20.15	26.62	20.37	23.52	17.50	25.54
MgO	0.00	0.00	0.00	0.08	0.02	0.12	0.01	0.01	0.02	0.09
CaO	34.05	34.66	35.01	33.50	34.54	33.62	33.97	34.13	35.04	33.64
Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01
MnO	0.09	0.12	0.16	0.09	0.12	0.10	0.12	0.10	0.13	0.10
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	97.15	96.62	98.76	97.64	97.43	96.40	96.70	97.96	97.04	96.30
K2O	0.04	0.06	0.05	0.00	0.00	0.02	0.06	0.06	0.03	0.01
F	0.00	0.00	0.00	0.04	0.00	0.00	0.02	0.00	0.00	0.00
Cl	0.00	0.02	0.10	0.02	0.00	0.00	0.00	0.00	0.02	0.06
SO3	0.00	0.02	0.03	0.00	0.05	0.12	0.05	0.05	0.00	0.22
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	25.35	23.13	19.56	29.96	22.39	29.57	22.32	26.13	19.44	28.37
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00
Sum(Adj)	99.68	98.93	100.71	100.63	99.67	99.35	98.93	100.57	98.98	99.13
Si	3.01	3.00	2.99	2.99	2.97	3.00	3.04	2.98	3.02	3.03
Al	0.00	0.00	0.01	0.01	0.03	0.00	0.00	0.02	0.00	0.00
Z	3.01	3.00	3.00	3.00	3.00	3.00	3.04	3.00	3.02	3.03
Al	0.38	0.47	0.81	0.11	0.58	0.05	0.53	0.37	0.71	0.11
Fe+3	1.58	1.44	1.18	1.88	1.38	1.88	1.39	1.62	1.19	1.80
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.96	1.91	1.99	1.99	1.96	1.93	1.92	1.98	1.90	1.91
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.01
Ca	3.02	3.08	3.00	3.00	3.03	3.05	3.01	3.01	3.07	3.04
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.03	3.09	3.01	3.01	3.04	3.07	3.04	3.02	3.08	3.06
Ad	79.15	72.18	58.77	93.81	68.59	94.06	69.99	80.65	59.97	90.63
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.00	0.00	0.00	0.33	0.00	0.50	0.04	0.04	0.00	0.38
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00
Sp	0.21	0.28	0.36	0.21	0.28	0.24	0.28	0.23	0.30	0.24
Gr	20.64	27.54	40.87	5.64	31.05	5.20	29.03	19.08	39.65	8.75

Skarn F samples

85JH148

85JH149

85JH148 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA2-1	GA2-2	GA3-1	GA3-2	GA4	GA5-1	GA5-2
Point	c	ir	r	c	r	c	r		r	c
Optics	zoned/c	A/c	A/c	I/c	A/c	<		A/c		>
SiO2	36.97	36.24	36.56	35.79	36.18	36.52	36.92	36.62	36.43	35.87
Al2O3	8.39	5.77	5.84	1.34	4.65	6.45	5.60	6.40	5.76	5.41
FeO(T)	18.52	21.79	21.75	27.05	23.34	20.77	21.69	21.06	21.79	21.97
MgO	0.04	0.06	0.04	0.11	0.05	0.04	0.05	0.06	0.01	0.04
CaO	35.77	35.22	35.38	34.14	35.10	35.34	35.03	35.31	35.32	35.15
Na2O	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
TiO2	0.06	0.06	0.16	0.03	0.02	0.15	0.31	0.19	0.08	0.09
MnO	0.21	0.14	0.12	0.10	0.13	0.14	0.14	0.14	0.12	0.12
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	99.96	99.28	99.86	98.56	99.48	99.41	99.74	99.78	99.51	98.65
K2O	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
F	0.07	0.17	0.05	0.01	0.10	0.11	0.08	0.20	0.05	0.07
Cl	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	
SO3	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.02	0.00	0.02
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	20.58	24.21	24.16	30.05	25.93	23.08	24.10	23.40	24.21	24.41
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	102.02	101.70	102.27	101.56	102.07	101.72	102.15	102.11	101.93	101.89
Si	2.93	2.92	2.93	2.96	2.92	2.93	2.96	2.93	2.93	2.91
Al	0.07	0.08	0.07	0.04	0.08	0.07	0.04	0.07	0.07	0.09
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Al	0.71	0.47	0.48	0.09	0.37	0.54	0.50	0.54	0.48	0.43
Fe+3	1.23	1.47	1.46	1.87	1.58	1.39	1.46	1.41	1.47	1.49
Ti	0.00	0.00	0.01	0.00	0.00	0.01	0.02	0.01	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	1.94	1.95	1.96	1.94	1.95	1.97	1.96	1.95	1.93
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00
Ca	3.04	3.04	3.04	3.02	3.04	3.04	3.01	3.03	3.04	3.06
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.06	3.06	3.05	3.04	3.06	3.05	3.03	3.04	3.05	3.07
Ad	60.54	72.33	72.00	92.65	77.69	68.89	72.58	69.67	72.33	73.39
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.16	0.24	0.16	0.45	0.20	0.16	0.20	0.24	0.04	0.16
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.46	0.31	0.27	0.23	0.29	0.31	0.32	0.31	0.27	0.27
Gr	38.84	27.12	27.57	6.67	21.81	30.63	26.90	29.78	27.36	26.18

85JH148 Garnet analyses

Grain	GA6-1	GA6-2	GA6-3	GA7-1	GA7-2	GA8-1	GA8-2	GA9-1	GA9-2
Point	c/CC	oc	r	c	r	c	r	c	r/AM
Optics	A/c	I/c	A/c	/c	A/c	/c	A/c	A/c	I/c
SiO2	36.81	35.71	36.54	35.80	35.95	36.89	37.05	36.75	35.50
Al2O3	8.56	1.69	5.56	0.38	1.14	6.06	5.11	6.66	0.17
FeO(T)	18.45	26.54	22.19	28.00	27.62	21.52	22.82	20.86	28.28
MgO	0.06	0.16	0.03	0.20	0.09	0.06	0.05	0.03	0.04
CaO	35.85	34.48	35.11	34.52	34.67	35.15	35.00	35.47	34.38
Na2O	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00
TiO2	0.21	0.05	0.11	0.06	0.00	0.05	0.08	0.03	0.00
MnO	0.16	0.14	0.06	0.10	0.10	0.15	0.13	0.19	0.11
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	100.11	98.78	99.61	99.06	99.57	99.88	100.25	99.99	98.48
K2O	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02
F	0.07	0.02	0.06	0.09	0.10	0.10	0.02	0.06	0.06
Cl	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
SO3	0.03	0.00	0.00	0.02	0.00	0.11	0.00	0.05	0.00
Formula basis = 8 cations, 12 oxygens									
Fe2O3(c)	20.50	29.49	24.65	31.11	30.69	23.91	25.35	23.18	31.42
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	102.16	101.73	102.07	102.17	102.64	102.27	102.78	102.31	101.62
Si	2.91	2.94	2.94	2.95	2.94	2.95	2.97	2.93	2.95
Al	0.09	0.06	0.06	0.04	0.06	0.05	0.03	0.07	0.02
Z	3.00	3.00	3.00	2.99	3.00	3.00	3.00	3.00	2.96
Al	0.71	0.10	0.47	0.00	0.05	0.52	0.45	0.56	0.00
Fe+3	1.22	1.83	1.49	1.93	1.89	1.44	1.53	1.39	1.96
Ti	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	1.93	1.96	1.93	1.94	1.97	1.98	1.95	1.96
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.02	0.00	0.02	0.01	0.01	0.01	0.00	0.00
Ca	3.04	3.04	3.03	3.05	3.04	3.01	3.00	3.03	3.06
Mn	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.06	3.07	3.04	3.08	3.06	3.03	3.02	3.05	3.07
Ad	60.11	90.22	73.83	95.58	93.41	71.38	75.96	68.66	97.16
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.23	0.65	0.12	0.81	0.36	0.24	0.20	0.12	0.16
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.35	0.32	0.14	0.23	0.23	0.34	0.29	0.42	0.26
Gr	39.30	8.81	25.92	3.37	6.00	28.05	23.55	30.80	2.42

85JH149 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA2-1	GA2-2	GA2-3	GA2-4	GA3-1	GA3-2	GA3-3
Point	c	ir	r/OP	c	oc	ir	or	c		
Optics	A/c	zoned	I/y	A/y	I/y	A/c	A/c	A/c	A/c	A/c
SiO2	36.52	35.61	34.34	35.27	34.21	35.16	36.28	36.64	35.99	36.24
Al2O3	6.66	2.84	0.00	4.08	0.16	2.50	5.70	6.94	4.01	4.93
FeO(T)	28.11	24.88	27.64	23.34	28.22	25.03	21.09	19.77	23.14	22.32
MgO	0.05	0.01	0.23	0.02	0.02	0.05	0.03	0.01	0.02	0.01
CaO	35.80	35.25	34.52	35.51	34.57	35.09	35.58	36.05	35.37	35.11
Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.10	0.00	0.00	0.00	0.00	0.00	0.23	0.08	0.00	0.04
MnO	0.20	0.13	0.15	0.09	0.13	0.07	0.08	0.18	0.14	0.11
Cr2O3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sum	99.44	98.72	96.88	98.31	97.31	97.90	98.99	99.67	98.67	98.76
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	0.08	0.08	0.00	0.09	0.14	0.12	0.07	0.00	0.10	0.03
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
SO3	0.00	0.02	0.03	0.00	0.05	0.00	0.08	0.00	0.00	0.01
Formula basis = 8 cations, 12 oxygens										
Fe2O3(c)	22.34	27.64	30.71	25.93	31.35	27.81	23.43	21.96	25.71	24.80
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	101.67	101.48	99.95	100.90	100.44	100.68	101.33	101.86	101.24	101.24
Si	2.93	2.92	2.89	2.89	2.88	2.91	2.93	2.93	2.93	2.94
Al	0.07	0.08	0.00	0.11	0.02	0.09	0.07	0.07	0.07	0.06
Z	3.00	3.00	2.89	3.00	2.89	3.00	3.00	3.00	3.00	3.00
Al	0.55	0.19	0.00	0.28	0.00	0.15	0.47	0.58	0.32	0.42
Fe+3	1.35	1.70	1.95	1.60	1.98	1.73	1.42	1.32	1.58	1.52
Ti	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.91	1.90	1.95	1.88	1.98	1.88	1.91	1.90	1.90	1.93
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Ca	3.07	3.09	3.12	3.11	3.11	3.11	3.08	3.08	3.09	3.06
Mn	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.09	3.10	3.16	3.12	3.13	3.12	3.09	3.10	3.10	3.07
Ad	66.44	83.82	95.39	78.08	96.75	84.92	70.43	65.07	77.86	75.00
Uv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Py	0.20	0.04	0.95	0.08	0.08	0.20	0.12	0.04	0.08	0.04
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.45	0.30	0.35	0.20	0.30	0.16	0.18	0.40	0.32	0.25
Gr	32.92	15.85	3.32	21.64	2.86	14.72	29.27	34.49	21.74	24.71

85JH149 Garnet analyses

Grain	GA4
Point	r
Optics	A/c
SiO2	36.23
Al2O3	4.89
FeO(T)	22.19
MgO	0.01
CaO	35.31
Na2O	0.00
TiO2	0.06
MnO	0.09
Cr2O3	n.d.
Sum	98.78
K2O	0.00
F	0.00
Cl	0.01
SO3	0.03

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	24.65
FeO(c)	0.00
Sum(Adj)	101.24
Si	2.94
Al	0.06
Z	3.00
Al	0.41
Fe+3	1.51
Ti	0.00
Cr	0.00
Y	1.92
Fe+2	0.00
Mg	0.00
Ca	3.07
Mn	0.01
Na	0.00
X	3.08
Ad	74.52
Uv	0.00
Py	0.04
Al	0.00
Sp	0.20
Gr	25.24

Skarn G samples

85JH136

B5JH136 Garnet analyses

Grain	GA1-1	GA1-2	GA2
Point	c	r	
Optics	<	A/c	>
SiO2	38.08	37.42	37.76
Al2O3	15.60	13.69	14.52
FeO(T)	10.10	12.03	10.69
MgO	0.02	0.01	0.06
CaO	32.75	33.13	34.10
Na2O	0.00	0.00	0.00
TiO2	0.08	0.07	0.36
MnO	3.81	3.08	2.49
Cr2O3	n.d.	n.d.	n.d.
Sum	100.44	99.43	99.98
K2O	0.00	0.00	0.00
F	0.16	0.26	0.03
Cl	0.00	0.00	0.01
SO3	0.08	0.11	0.00
Formula basis = 8 cations, 12 oxygens			
Fe2O3(c)	11.22	13.37	11.88
FeO(c)	0.00	0.00	0.00
Sum(Adj)	101.56	100.77	101.17
Si	2.95	2.94	2.94
Al	0.05	0.06	0.06
Z	3.00	3.00	3.00
Al	1.37	1.21	1.27
Fe+3	0.65	0.79	0.70
Ti	0.00	0.00	0.02
Cr	0.00	0.00	0.00
Y	2.03	2.00	1.99
Fe+2	0.00	0.00	0.00
Mg	0.00	0.00	0.01
Ca	2.72	2.79	2.84
Mn	0.25	0.21	0.16
Na	0.00	0.00	0.00
X	2.97	3.00	3.01
Ad	32.39	39.09	34.49
Uv	0.00	0.00	0.00
Py	0.08	0.04	0.23
Al	0.00	0.00	0.00
Sp	8.27	6.77	5.44
Gr	59.27	54.09	59.85

Additional samples

BMG 2400 A 214-215	drill core sample from Battle Mountain Gold Company's Surprise Deposit at Copper Basin
BMG 1998 314'	drill core sample from Battle Mountain Gold Company's Fortitude Deposit at Copper Canyon

BMG 2400A 214-215 Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA1-5	GA1-6	GA1-7	GA1-8	GA2-1	GA2-2
Area	c	r	oc*	r*	r*	r*	r*	r*	r	mr
Optics	I/y	I/y	I/y	I/pale y	I/y	A/c	I/y	I/y	A/c	A/c
SiO2	33.40	34.70	35.32	35.40	35.76	34.99	34.90	34.60	37.59	39.20
Al2O3	0.25	0.06	0.03	0.02	0.81	5.48	0.18	0.00	7.72	15.84
FeO(T)	27.87	28.59	29.11	28.98	28.66	22.50	28.79	29.16	19.49	9.52
MgO	0.39	0.37	0.34	0.29	0.31	0.30	0.30	0.35	0.34	0.27
CaO	32.75	33.04	33.05	33.02	33.12	34.03	32.75	33.30	35.18	35.92
Na2O	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.02	0.00
TiO2	0.00	0.05	0.00	0.00	0.00	0.02	0.00	0.01	0.09	0.09
MnO	0.53	0.27	0.19	0.20	0.21	0.23	0.24	0.21	0.28	0.34
Cr2O3	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Sum	95.20	97.09	98.06	97.93	98.88	97.55	97.17	97.64	100.71	101.18
ZnO	0.00	0.20	0.03	0.12	0.03	0.00	0.00	0.00	0.29	0.06

* Traverse across centers of succesive 0.01 mm wide growth zones from outer core towards rim

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	30.96	31.76	32.34	32.20	31.84	25.00	31.99	32.40	21.65	10.46
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
Sum(Adj)	98.29	100.26	101.29	101.15	102.06	100.05	100.37	100.88	102.87	102.22
Si	2.87	2.92	2.95	2.96	2.95	2.87	2.94	2.90	2.96	2.98
Al	0.03	0.01	0.00	0.00	0.05	0.13	0.02	0.00	0.04	0.02
Z	2.89	2.93	2.95	2.96	3.00	3.00	2.96	2.90	3.00	3.00
Al	0.00	0.00	0.00	0.00	0.03	0.41	0.00	0.00	0.68	1.41
Fe+3	2.00	2.01	2.03	2.03	1.98	1.55	2.03	2.04	1.28	0.60
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.00	2.02	2.03	2.03	2.01	1.95	2.03	2.05	1.97	2.01
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Mg	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03
Ca	3.01	2.98	2.96	2.96	2.93	3.00	2.96	2.99	2.97	2.93
Mn	0.04	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.10	3.05	3.01	3.01	2.99	3.05	3.01	3.05	3.03	2.99
Ad	97.13	97.87	98.17	98.31	98.12	75.39	98.23	98.12	63.82	29.91
Uv	0.00	0.00	0.03	0.06	0.03	0.00	0.00	0.00	0.00	0.00
Py	1.62	1.51	1.37	1.17	1.26	1.20	1.22	1.40	1.33	1.02
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Sp	1.25	0.63	0.43	0.46	0.49	0.52	0.55	0.48	0.62	0.73
Gr	0.00	0.00	0.00	0.00	0.10	22.89	0.00	0.00	34.24	68.12

BMG 2400A 214-215 Garnet analyses

Grain	GA2-3	GA2-4	GA2-5	GA2-6	GA2-7	GA2-8	GA3-1	GA3-2	GA3-3	GA3-4
Area	ir	oc				c	r/GA4			alt b
Optics	A/c	I/y	I/y	I/y	I/y	I/y	A/c	A/c	A/c	
	Traverse from rim to core									
SiO2	38.99	36.49	36.82	35.75	35.39	34.99	37.62	36.84	36.36	35.14
Al2O3	12.89	0.00	0.01	0.00	0.01	0.00	12.99	10.06	9.24	0.00
FeO(T)	12.21	28.68	28.90	29.00	28.65	28.87	12.39	15.75	17.30	28.87
MgO	0.29	0.43	0.41	0.31	0.36	0.30	0.29	0.31	0.26	0.38
CaO	35.83	33.63	33.47	33.34	33.25	33.06	35.76	35.47	34.68	33.33
Na2O	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
TiO2	0.84	0.00	0.01	0.02	0.00	0.00	0.48	1.10	0.94	0.00
MnO	0.28	0.22	0.26	0.33	0.19	0.35	0.31	0.32	0.23	0.19
Cr2O3	0.00	0.00	0.02	0.00	0.09	0.00	0.00	0.00	0.02	0.00
Sum	101.34	99.46	99.90	98.84	97.94	97.57	99.84	99.86	99.03	97.91
ZnO	0.00	0.00	0.03	0.00	0.09	0.00	0.01	0.12	0.01	

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	12.87	31.86	31.93	32.31	31.83	32.07	13.77	17.50	19.22	32.07
FeO(c)	0.62	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	102.63	102.64	103.09	102.07	101.12	100.77	101.22	101.61	100.95	101.11
Si	3.00	3.00	3.01	2.96	2.96	2.94	2.93	2.90	2.90	2.94
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.10	0.10	0.00
Z	3.00	3.00	3.01	2.96	2.96	2.94	3.00	3.00	3.00	2.94
Al	1.16	0.00	0.00	0.00	0.00	0.00	1.12	0.84	0.77	0.00
Fe+3	0.74	1.97	1.97	2.01	2.00	2.03	0.81	1.04	1.16	2.02
Ti	0.05	0.00	0.00	0.00	0.00	0.00	0.03	0.07	0.06	0.00
Cr	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Y	1.96	1.97	1.97	2.02	2.01	2.03	1.96	1.94	1.99	2.02
Fe+2	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.05	0.05	0.04	0.04	0.04	0.03	0.04	0.03	0.05
Ca	2.95	2.96	2.94	2.96	2.98	2.97	2.99	3.00	2.97	2.98
Mn	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.04	3.03	3.01	3.02	3.03	3.04	3.04	3.06	3.01	3.05
Ad	37.58	97.75	97.33	98.00	97.81	97.98	40.04	51.63	57.29	98.03
Uv	0.00	0.00	0.06	0.00	0.29	0.00	0.00	0.00	0.06	0.00
Py	1.12	1.75	1.65	1.24	1.46	1.21	1.12	1.21	1.03	1.54
Al	1.35	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.61	0.51	0.60	0.75	0.44	0.80	0.68	0.71	0.52	0.44
Gr	59.34	0.00	0.00	0.00	0.00	0.00	58.17	46.45	41.10	0.00

BMG 2400A 214-215 Garnet analyses

Grain	GA3-5	GA3-6	GA3-7	GA3-8	GA3-9	GA3-10	GA3-11	GA3-12	GA3-13	GA4-1
Area	m					oc	c	oc	m*	r
Optics	I/y	I/y	I/y	I/y	I/y	I/y	I/y	I/y	alt	A/c
SiO2	34.91	34.94	35.93	34.93	35.10	34.41	34.36	36.13	35.93	39.58
Al2O3	0.03	0.00	0.01	0.02	0.21	0.01	0.00	0.60	0.07	16.37
FeO(T)	29.02	28.55	28.95	28.87	27.64	28.81	28.71	28.03	28.63	8.77
MgO	0.40	0.29	0.33	0.30	0.37	0.34	0.33	0.34	0.32	0.29
CaO	33.13	33.52	33.50	33.21	31.74	33.20	33.40	33.25	33.40	36.20
Na2O	0.02	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00
TiO2	0.02	0.00	0.00	0.04	0.01	0.00	0.00	0.04	0.00	0.07
MnO	0.22	0.30	0.26	0.24	0.36	0.42	0.24	0.21	0.24	0.34
Cr2O3	0.07	0.01	0.00	0.00	0.02	0.03	0.03	0.00	0.00	0.00
Sum	97.82	97.61	98.98	97.62	95.46	97.22	97.08	98.60	98.59	101.62
ZnO	0.29	0.01	0.04	0.06	0.08	0.02	0.00	0.00	0.01	

* GA3-13 = same zone as GA3-6, but area around -13 is altered

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	32.24	31.72	32.16	32.07	30.44	32.01	31.90	31.14	31.81	9.58
FeO(c)	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.15
Sum(Adj)	101.04	100.78	102.19	100.82	98.50	100.42	100.27	101.71	101.77	102.58
Si	2.92	2.93	2.97	2.93	3.01	2.90	2.90	2.99	2.98	2.99
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Z	2.92	2.93	2.97	2.93	3.01	2.90	2.90	3.00	2.99	3.00
Al	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.05	0.00	1.45
Fe+3	2.03	2.00	2.00	2.02	1.96	2.03	2.02	1.94	1.99	0.55
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	2.04	2.00	2.00	2.03	1.99	2.03	2.03	1.99	1.99	2.00
Fe+2	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01
Mg	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.03
Ca	2.97	3.01	2.97	2.98	2.91	3.00	3.02	2.95	2.97	2.93
Mn	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.01	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.04	3.07	3.03	3.04	3.01	3.07	3.08	3.01	3.03	3.00
Ad	97.67	98.08	98.07	98.23	96.94	97.57	98.01	96.91	98.14	27.25
Uv	0.22	0.03	0.00	0.00	0.07	0.10	0.10	0.00	0.00	0.00
Py	1.60	1.19	1.33	1.22	1.56	1.37	1.34	1.40	1.31	1.09
Al	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.31
Sp	0.50	0.70	0.60	0.55	0.86	0.96	0.55	0.49	0.56	0.73
Gr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	70.61

BMG 2400A 214-215 Garnet analyses

Grain	GA4-2	GA4-3	GA4-4	GA4-5	GA4-6	GA5-1	GA5-2	GA5-3	GA5-4
Area	m	c	c	m	r	r	ir	oc	c
Optics	A/c	A/c	A/c	A/c	A/c	A/c	A/c	I/y	I/y
	Traverse across GA4 rim to core to opposite rim								
SiO2	38.87	38.94	39.44	38.79	35.86	36.82	36.54	34.76	33.75
Al2O3	13.90	13.45	14.26	15.97	9.74	15.45	9.35	0.79	0.00
FeO(T)	11.58	12.04	11.60	9.31	16.85	9.41	16.87	27.56	28.99
MgO	0.29	0.27	0.28	0.29	0.25	0.28	0.31	0.41	0.37
CaO	35.70	35.57	36.08	36.11	35.05	36.15	34.73	33.62	33.39
Na2O	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
TiO2	0.48	0.38	0.09	0.03	0.00	0.20	0.95	0.02	0.00
MnO	0.34	0.29	0.33	0.34	0.19	0.36	0.23	0.28	0.31
Cr2O3	0.01	0.04	0.00	0.01	0.00	0.00	0.02	0.02	0.01
Sum	101.18	100.99	102.08	100.85	97.95	98.67	99.00	97.46	96.82
ZnO	0.01	0.00	0.03	0.04	0.00	0.00	0.00	0.04	0.07

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	12.57	12.81	12.69	10.34	18.72	10.45	18.74	30.62	32.21
FeO(c)	0.26	0.51	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	102.44	102.27	103.35	101.88	99.82	99.71	100.87	100.52	100.04
Si	2.98	3.00	2.99	2.96	2.88	2.87	2.92	2.91	2.85
Al	0.02	0.00	0.01	0.04	0.12	0.13	0.08	0.08	0.00
Z	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.99	2.85
Al	1.24	1.22	1.27	1.40	0.80	1.29	0.79	0.00	0.00
Fe+3	0.73	0.74	0.73	0.59	1.13	0.61	1.13	1.93	2.05
Ti	0.03	0.02	0.01	0.00	0.00	0.01	0.06	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.99	1.98	2.00	1.99	1.94	1.92	1.98	1.93	2.05
Fe+2	0.02	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.05
Ca	2.93	2.93	2.93	2.95	3.02	3.02	2.97	3.01	3.03
Mn	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.01	3.02	3.00	3.01	3.06	3.08	3.02	3.08	3.09
Ad	36.38	37.25	36.25	29.47	55.32	30.01	55.96	94.65	97.77
Uv	0.03	0.12	0.00	0.03	0.00	0.00	0.06	0.06	0.03
Py	1.11	1.04	1.06	1.09	0.98	1.06	1.22	1.68	1.49
Al	0.56	1.10	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.74	0.63	0.71	0.73	0.42	0.78	0.52	0.65	0.71
Gr	61.18	59.85	61.60	68.68	43.28	68.15	42.24	2.96	0.00

BMG DH1998 314' Garnet analyses

Grain	GA1-1	GA1-2	GA1-3	GA1-4	GA2-1	GA2-2	GA2-3	GA2-4
Area	< same band >							<same band as -1>
Point	A/c	A/c	I/y	I/y	I/c	I/y	I/y	I/c
SiO2	35.12	36.93	35.12	34.80	36.06	34.75	34.54	36.13
Al2O3	6.35	6.48	0.03	0.01	0.20	0.02	0.05	0.33
FeO(T)	21.08	21.23	29.40	29.26	28.26	28.28	29.40	28.37
MgO	0.27	0.28	0.32	0.29	0.41	0.38	0.30	0.39
CaO	34.43	34.25	33.51	32.97	33.57	33.24	33.37	33.30
Na2O	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
TiO2	0.49	0.31	0.01	0.00	0.02	0.02	0.00	0.00
MnO	0.33	0.31	0.24	0.23	0.06	0.22	0.22	0.07
Cr2O3	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Sum	98.07	99.79	98.63	97.56	98.59	96.92	97.88	98.59
ZnO	0.00	0.00	0.05	0.01	0.02	0.09	0.00	0.02

Formula basis = 8 cations, 12 oxygens

Fe2O3(c)	23.42	23.59	32.66	32.51	31.40	31.42	32.66	31.52
FeO(c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum(Adj)	100.41	102.15	101.89	100.81	101.73	100.06	101.14	101.74
Si	2.86	2.96	2.92	2.92	2.99	2.93	2.89	2.99
Al	0.14	0.04	0.00	0.00	0.01	0.00	0.00	0.01
Z	3.00	3.00	2.92	2.92	3.00	2.93	2.90	3.00
Al	0.47	0.57	0.00	0.00	0.01	0.00	0.00	0.03
Fe+3	1.44	1.42	2.04	2.06	1.96	1.99	2.06	1.97
Ti	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	1.94	2.01	2.04	2.06	1.97	2.00	2.06	1.99
Fe+2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.03	0.03	0.04	0.04	0.05	0.05	0.04	0.05
Ca	3.01	2.94	2.98	2.97	2.98	3.00	2.99	2.96
Mn	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X	3.06	2.99	3.04	3.02	3.03	3.07	3.05	3.01
Ad	70.29	70.70	98.19	98.32	97.63	97.92	98.31	98.13
Uv	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
Py	1.07	1.11	1.27	1.16	1.69	1.57	1.19	1.61
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sp	0.74	0.70	0.54	0.52	0.14	0.52	0.50	0.16
Gr	27.89	27.50	0.00	0.00	0.51	0.00	0.00	0.10

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APPENDIX A

	D.L.[1]	spectrometer	standard[2]
Si	0.05	ADP	Kakanui pyrope or Lake County labradorite
Al	0.02	TAP	" " "
Fe	0.04	LiF	hedenbergite M12330
Mg	0.03	TAP	Kakanui pyrope or Adirondack diopside
Ca	0.02	LiF	Mammoth Lakes wollastonite or Kakanui pyrope or hedenbergite M12330
Na	0.01	TAP	synthetic sodic fluor-richterite #44
Ti	0.03	LiF	Hemet sphene
Mn	0.05	LiF	Broken Hill rhodonite
Cr	0.05	LiF	Tiebaghi chromite
K	0.07	ADP or PET	Benson orthoclase
F	0.09	TAP	synthetic fluor-phlogopite
Cl	0.14	ADP or PET	Lemhi biotite or Brazilian scapolite
S	0.38	PET	synthetic anhydrite
Zn	0.10	LiF	gahnite No. 111989

Low- and high- average atomic number standards used as endpoints for the background interpolation routine include quartz, periclase, synthetic fayalite and pure V_2O_5.

Standard deviations based on replicate analyses on homogeneous working standards indicate analytical precision on the order of $\pm$ 2 relative % for major elements, $\pm$ 10 relative % for minor elements.

[1]Typical detection limits, in terms of oxide weight precent; based on analyses of working standards containing appropriate concentrations of the elements for garnets.
[2]These standards are described in detail by Huebner and Woodruff (1985).

APPENDIX B

Sample formula calculation for 84JH043 GA1-1

oxide	wt %	MW	mol. prop.	# O	# anions	# cations	normalized cations
SiO_2	36.12	60.09	0.60110	1.20220	6.47345	3.24	2.98
Al_2O_3	1.46	101.94	0.01432	0.04297	0.23138	0.15	0.15
FeO(T)	26.48	71.85	0.36855	0.36855	1.98452	1.98	1.83
CaO	33.96	56.08	0.60556	0.60556	3.26074	3.26	3.01
Na_2O	0.01	61.982	0.00016	0.00016	0.00086	0.00	0.00
TiO_2	0.15	79.90	0.00188	0.00375	0.02019	0.01	0.01
MnO	0.38	70.94	0.00536	0.00536	0.02886	0.03	0.03
	98.56			2.22855		8.67	8.01

Normalization factor for 12 oxygen formula unit: 12/2.22855 = 5.38467

The sum of cations based on a 12 oxygen formula unit is 8.67 rather 8.00 for an ideal garnet.

Ferric iron computation:

Si 2.98 * 2	oxygens per cation	= 5.96
Al 0.14 * 1.5	"	= 0.21
Fe 1.83 * 1	"	= 1.83
Ca 3.01 * 1	"	= 3.01
Ti 0.01 * 2	"	= 0.02
Mn 0.03 * 1	"	= 0.03
		11.06

12.00(ideal negative charge) - 11.06 (negative charge for analysis)= 0.94

2 * 0.94 = 1.88 (Fe^{+3} needed for ideal stoichiometry)

1.88 > 1.83 (Fe available)

Since the total Fe available is less than the amount needed to convert to ferric iron to maintain ideal garnet stoichiometry, the iron is not partitioned into ferrous and ferric but is treated as all ferric iron.
This result could indicate the absence of ferrous iron, a missing hydrogarnet component, or analytical error.

26.48 (FeO(T)) * 1.111 = 26.48 (Fe_2O_3)