

Appendix 1. Mineral assemblages of analysed samples

	LS 81-157	LS 92-B-1b	LS 81-161	LS 81-478	LS 81-53	BS 92-B-1a	BS 81-564	BS 81-176	AP 81-16	AP 81-151	AP 83-670	AP 81-137
Ms	X	X	X	X	X	X	X	X	X	X	X	X
Qtz	X	X	X	X	X	X	X	X	X	X	X	X
Ab	X	X	X	X	X	X	X	X	X	X	X	X
Ep	X	X	X									
Chl	X	X	X	X	2	X	X	X	X		X	X
Bt		X	X	X	X				X	X	X	X
Grt		X	X	X	X							a
Ilm	X	X	X	X	X				X	X	X	X
Rt												
Po		X				X	X	X				
Py					X	X	X	X				
Gr						X	X	X				

Mineral abbreviations from Kretz (1983)

2 = secondary

a = altered

Appendix 2. Whole rock compositions

Wt %	LS average n = 8	LS St Dev n = 8	LS 81-157	LS 92-B-1b	LS 81-478	BS average n = 12	BS St Dev n = 12	BS 92-B-1a	BS 81-564	BS 81-176	AP average n = 8	AP St Dev n = 8	AP 81-151	AP 81-137
SiO2	61.98	4.41	70.98	58.34	63.14	60.68	2.12	62.25	61.38	63.46	62.55	4.98	67.86	53.69
TiO2	0.98	0.21	0.61	1.22	0.91	0.84	0.05	0.90	0.84	0.76	0.81	0.13	0.76	0.98
Al2O3	17.80	2.41	13.29	19.22	16.88	19.94	2.10	19.98	18.09	17.23	18.18	3.25	14.26	23.96
FeO	6.84	1.05	5.18	8.03	6.45	5.20	1.04	4.24	5.38	4.93	5.55	0.84	5.18	6.85
MnO	0.10	0.04	0.05	0.16	0.09	0.05	0.02	0.03	0.05	0.04	0.06	0.03	0.04	0.07
MgO	2.04	0.31	1.76	2.31	2.01	3.44	1.00	2.39	3.69	3.75	2.78	1.51	2.33	2.39
CaO	0.46	0.17	0.57	0.73	0.41	0.12	0.09	0.10	0.03	0.09	0.12	0.09	0.24	0.01
Na2O	1.98	0.52	1.83	2.69	2.12	1.50	0.43	2.28	2.36	1.42	1.50	0.54	1.49	0.94
K2O	3.93	0.68	2.92	3.50	4.16	3.80	0.79	3.99	3.15	3.15	4.49	1.14	4.56	5.30
P2O5	0.20	0.11	0.12	0.40	0.19	0.07	0.02	0.08	0.06	0.09	0.08	0.03	0.13	0.04
LOI	2.91	0.70	2.17	3.00	n/a	3.82	0.93	3.55	n/a	n/a	n/a	n/a	n/a	n/a
Total	99.22	1.93	99.47	99.61	96.36	99.46	2.02	99.78	95.03	94.92	96.10	0.97	96.85	94.23
S	0.01	0.01	0.01	0.03	n/a	0.17	0.13	0.06	n/a	n/a	n/a	n/a	n/a	n/a
C	0.06	0.02	0.04	0.08	n/a	0.65	0.18	0.39	n/a	n/a	n/a	n/a	n/a	n/a

Moles elements x 100; MnNCKFMASHT (C and P dropped; projected from pyrrhotite)

Si	103.16	7.33	118.13	97.10	105.08	100.98	3.53	103.60	102.16	105.62	104.09	8.28	112.94	89.36
Ti	1.23	0.26	0.76	1.53	1.14	1.05	0.07	1.12	1.05	0.95	1.02	0.16	0.95	1.23
Al	34.92	4.74	26.07	37.70	33.11	39.12	3.95	39.19	35.48	33.80	35.66	6.38	27.97	47.00
Fe	9.50	1.46	7.18	11.09	8.95	6.71	1.45	5.72	6.97	6.34	7.72	1.17	7.20	9.53
Mn	0.14	0.06	0.07	0.23	0.13	0.07	0.03	0.04	0.07	0.06	0.08	0.04	0.06	0.10
Mg	5.05	0.78	4.37	5.73	4.99	8.54	2.48	5.93	9.16	9.30	6.89	3.74	5.78	5.93
Ca	0.81	0.29	1.02	1.30	0.73	0.22	0.16	0.18	0.05	0.16	0.21	0.15	0.43	0.02
Na	6.39	1.66	5.91	8.68	6.84	4.84	1.38	7.36	7.62	4.58	4.84	1.75	4.81	3.03
K	8.35	1.45	6.20	7.43	8.83	8.07	1.67	8.47	6.69	6.69	9.52	2.42	9.68	11.25
Mg#	0.347	0.020	0.377	0.339	0.357	0.541	0.046	0.501	0.550	0.575	0.471	0.103	0.445	0.384
Mg#(S)	0.347	0.021	0.378	0.341	0.358	0.560	0.050	0.509	0.568	0.595	0.471	0.103	0.445	0.384
Mg#(S+Ti)	0.380	0.021	0.405	0.375	0.390	0.560	0.050	0.509	0.568	0.595	0.507	0.102	0.480	0.417
A'	0.056	0.086	-0.022	0.119	-0.071	0.240	0.028	0.207	0.193	0.220	0.063	0.261	-0.390	0.263
Mn#	0.009	0.003	0.006	0.012	0.009	0.004	0.001	0.003	0.004	0.003	0.005	0.003	0.004	0.006
Ca#	0.052	0.017	0.080	0.071	0.049	0.013	0.021	0.015	0.003	0.010	0.019	0.011	0.032	0.001

Mg# = Mg/(Mg+Fe)

Mg#(S) = Mg/(Mg+Fe), after projection from pyrrhotite

Mg#(S+Ti) = Mg/(Mg+Fe), after projection from pyrrhotite and ilmenite (not for Rt-bearing BS)

A' = (Al-Na-2Ca-3K)/2

Mn# = Mn/(Mn+Fe+Mg+Ca)

Ca# = Ca/(Mn+Fe+Mg+Ca)

Appendix 3. Garnet compositions

Wt %	LS	LS	LS	LS	LS	LS	LS	LS
	92-B-1b core	92-B-1b rim	81-161 core	81-161 rim	81-478 core	81-478 rim	81-53 core	81-53 rim
SiO2	36.60	36.42	37.64	37.53	37.50	37.82	37.50	36.90
TiO2	0.00	0.00	0.14	0.10	0.16	0.13	0.10	0.10
Al2O3	20.49	20.67	21.18	20.94	20.72	20.99	21.00	20.90
FeO	25.40	32.20	25.63	28.60	25.86	28.05	24.10	27.50
MnO	6.68	2.43	6.66	4.21	6.99	5.07	10.00	6.70
MgO	0.66	1.06	0.78	1.00	0.65	0.79	0.70	1.00
CaO	9.61	7.18	8.88	7.76	8.61	7.86	7.40	6.90
Total	99.44	99.96	100.91	100.14	100.49	100.71	100.80	100.00

Cations for 12 oxygens

Si	2.98	2.96	3.00	3.01	3.01	3.02	3.00	2.98
Ti	1.96	1.98	1.99	1.98	1.96	1.98	1.98	1.99
Al	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Fe	1.73	2.19	1.71	1.92	1.74	1.87	1.61	1.86
Mn	0.46	0.17	0.45	0.29	0.48	0.34	0.68	0.46
Mg	0.08	0.13	0.09	0.12	0.08	0.09	0.08	0.12
Ca	0.84	0.63	0.76	0.67	0.74	0.67	0.64	0.60
Sum	8.04	8.05	8.00	7.99	8.01	7.99	8.00	8.02
Mg#	0.044	0.055	0.052	0.059	0.043	0.048	0.049	0.061
Xsps	0.148	0.054	0.149	0.096	0.157	0.115	0.225	0.151
Xgrs	0.270	0.201	0.252	0.223	0.244	0.225	0.211	0.197
Xalm	0.556	0.704	0.568	0.641	0.573	0.628	0.536	0.612
Xprp	0.026	0.041	0.031	0.040	0.026	0.032	0.028	0.040

Mg# = Mg/(Mg+Fe)

Xsps = Mn/(Mn+Fe+Mg+Ca)

Xgrs = Ca/(Mn+Fe+Mg+Ca)

Xalm = Fe/(Mn+Fe+Mg+Ca)

Xprp = Mg/(Mn+Fe+Mg+Ca)

Appendix 4. Biotite compositions

Wt %	LS	LS	LS	LS	AP	AP	AP	AP
	92-B-1b	81-161	81-478	81-53	81-16	81-151	83-670	81-137
SiO2	35.31	34.27	35.78	35.93	37.38	34.88	37.84	34.55
TiO2	1.81	2.05	1.98	2.28	1.94	0.66	1.83	1.39
Al2O3	18.39	17.44	18.30	17.62	16.14	19.06	16.56	19.84
FeO	23.86	22.72	22.60	21.71	18.38	16.08	19.91	22.21
MnO	0.14	0.20	0.16	0.22	0.09	0.13	0.14	0.15
MgO	6.95	7.72	7.23	7.71	11.24	12.56	10.38	7.11
CaO	0.10	0.01	0.00	0.02	0.10	0.01	0.01	0.01
Na2O	0.10	0.05	0.21	0.13	0.08	0.16	0.20	0.00
K2O	8.14	8.45	8.19	7.93	7.68	9.67	9.37	6.05
F	0.23	0.24	0.09	0.28	0.58	0.30	0.00	0.00
Total	95.03	93.15	94.54	93.83	93.61	93.51	96.24	91.31

Cations for 11 oxygens

Si	2.74	2.72	2.77	2.79	2.87	2.68	2.85	2.73
Ti	0.11	0.12	0.12	0.13	0.11	0.04	0.10	0.08
Al	1.68	1.63	1.67	1.62	1.46	1.73	1.47	1.85
Fe	1.55	1.51	1.46	1.41	1.18	1.03	1.25	1.47
Mn	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01
Mg	0.80	0.91	0.83	0.89	1.28	1.44	1.16	0.84
Ca	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.02	0.01	0.03	0.02	0.01	0.02	0.03	0.00
K	0.81	0.86	0.81	0.79	0.75	0.95	0.90	0.61
Sum	7.72	7.77	7.70	7.67	7.66	7.90	7.76	7.57
Mg#	0.342	0.377	0.363	0.387	0.520	0.582	0.481	0.363

Appendix 5. Muscovite compositions

Wt %	LS	LS	LS	LS	LS	BS	BS	BS	AP	AP	AP	AP
	81-157	92-B-1b	81-161	81-478	81-53	92-B-1a	81-564	81-176	81-16	81-151	83-670	81-137
SiO2	46.07	46.31	46.75	47.54	48.73	47.26	46.44	48.92	49.53	48.01	47.76	47.10
TiO2	0.33	0.31	0.38	0.33	0.35	0.31	2.45	0.26	0.55	0.57	0.48	0.38
Al2O3	30.80	33.24	32.67	31.97	31.02	34.49	32.19	33.24	28.62	27.99	28.76	33.83
FeO	3.67	2.76	2.40	2.91	2.71	1.50	1.56	1.36	2.66	4.67	5.20	2.40
MnO	0.01	0.01	0.03	0.04	0.01	0.01	0.01	0.00	0.01	0.03	0.01	0.00
MgO	1.37	1.36	1.38	1.43	1.74	1.31	1.76	1.77	2.69	2.44	2.44	1.13
CaO	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Na2O	0.68	0.49	0.49	0.63	0.51	0.60	0.60	0.63	0.37	0.19	0.49	0.60
K2O	9.78	9.96	9.92	9.63	9.46	9.52	9.20	9.17	9.99	10.67	10.27	8.73
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	92.71	94.46	94.02	94.48	94.53	95.01	94.21	95.35	94.42	94.57	95.41	94.17

Cations for 11 oxygens

Si	3.19	3.12	3.16	3.20	3.26	3.13	3.12	3.22	3.33	3.28	3.24	3.15
Ti	0.02	0.02	0.02	0.02	0.02	0.02	0.12	0.01	0.03	0.03	0.02	0.02
Al	2.51	2.64	2.60	2.54	2.45	2.70	2.55	2.58	2.27	2.26	2.30	2.67
Fe	0.21	0.16	0.14	0.16	0.15	0.08	0.09	0.08	0.15	0.27	0.30	0.13
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.14	0.14	0.14	0.14	0.17	0.13	0.18	0.17	0.27	0.25	0.25	0.11
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.09	0.07	0.06	0.08	0.07	0.08	0.08	0.08	0.05	0.03	0.06	0.08
K	0.86	0.86	0.86	0.83	0.81	0.81	0.79	0.77	0.86	0.93	0.89	0.75
Sum	7.02	7.01	6.98	6.97	6.93	6.94	6.92	6.90	6.96	7.04	7.06	6.91

Appendix 6. Chlorite compositions

Wt %	LS	LS	LS	LS	LS	BS	BS	BS	AP	AP	AP		
	81-157	92-B-1b	81-161	81-478	81-53	92-B-1a	81-564	81-176	81-16	83-670	81-137		
					2ndary								
SiO2	23.78	23.89	23.91	24.37	23.95	25.06	23.98	25.57	25.72	25.28	24.24		
TiO2	0.10	0.06	0.06	0.04	0.11	0.05	0.05	0.10	0.05	0.06	0.34		
Al2O3	21.29	22.61	21.46	21.36	21.44	23.42	21.16	21.91	20.54	20.68	22.30		
FeO	30.56	30.38	28.98	30.13	29.01	24.64	19.88	19.05	23.89	25.36	28.39		
MnO	0.18	0.26	0.26	0.27	0.40	0.15	0.17	0.22	0.09	0.23	0.24		
MgO	11.22	10.22	11.50	11.05	11.80	14.32	17.33	18.43	15.48	15.21	11.05		
CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00		
Na2O	0.00	0.06	0.00	0.01	0.01	0.05	0.01	0.02	0.11	0.00	0.00		
K2O	0.04	0.03	0.06	0.02	0.03	0.01	0.03	0.08	0.05	0.04	0.27		
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total	87.17	87.51	86.23	87.25	86.75	87.70	82.61	85.38	85.99	86.86	86.83		

Cations for 14 oxygens

Si	2.60	2.60	2.63	2.66	2.61	2.62	2.62	2.68	2.75	2.70	2.63
Ti	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.03
Al	2.75	2.90	2.78	2.74	2.76	2.89	2.73	2.70	2.58	2.60	2.85
Fe	2.80	2.76	2.66	2.75	2.65	2.16	1.82	1.67	2.13	2.26	2.58
Mn	0.02	0.02	0.02	0.02	0.04	0.01	0.02	0.02	0.00	0.02	0.02
Mg	1.83	1.66	1.88	1.80	1.92	2.23	2.82	2.88	2.46	2.42	1.79
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00
K	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.04
Sum	10.02	9.95	9.98	9.97	9.99	9.92	10.01	9.97	9.94	10.00	9.94
Mg#	0.395	0.376	0.414	0.396	0.420	0.508	0.608	0.633	0.536	0.517	0.410

Appendix 7. Plagioclase and epidote compositions

Wt %	LS	LS	LS	LS	LS	LS	BS
	81-157	81-157	92-B-1b	81-161	81-478	81-53	81-564
	Ep	Pl	Pl	Pl	Pl	Pl	Pl
SiO ₂	37.12	69.56	65.95	67.72	68.10	68.65	70.65
TiO ₂	0.00	0.00	0.00	0.00	0.00	0.03	0.01
Al ₂ O ₃	23.34	19.23	20.44	19.53	19.34	20.84	19.84
FeO	10.89	0.29	0.18	0.22	0.20	0.34	0.06
MnO	0.32	0.14	0.00	0.00	0.00	0.00	0.00
MgO	0.29	0.00	0.01	0.00	0.00	0.08	0.00
CaO	21.05	0.32	0.48	0.20	0.06	0.12	0.10
Na ₂ O	0.45	11.47	10.79	11.39	11.57	10.87	11.49
K ₂ O	0.00	0.00	0.09	0.08	0.07	0.86	0.07
BaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	93.46	101.01	97.92	99.14	99.34	101.79	102.22

Cations for 8 oxygens (plagioclase) or 25 oxygens (epidote)

Si	6.07	3.01	2.94	2.99	3.00	2.96	3.01
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	4.50	0.98	1.08	1.01	1.00	1.06	1.00
Fe ³⁺	1.49	0.01	0.01	0.01	0.01	0.01	0.00
Mn	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Ca	3.69	0.015	0.023	0.008	0.004	0.006	0.005
Na	0.14	0.96	0.93	0.97	0.99	0.91	0.95
K	0.00	0.00	0.01	0.01	0.01	0.05	0.01
Sum	16.00	4.98	4.99	4.99	5.01	5.00	4.98
XAn	---	0.015	0.024	0.008	0.004	0.006	0.005
Fe/(Fe+Al)	0.25	---	---	---	---	---	---

XAn = Na/(Na+Ca)

! Appendix 8 of Pattison, JGS 2012

! -----> dont' forget: at least two blanks between items!!! <-----

! For the most typical case, only one chemical input line is needed. The following lines are ignored. For calculation of binary or ternary diagrams however, two or three chemical input lines are needed that define the system's endmember compositions.

!	1.	0000	250	0.020000	0.1000000E-08	0.1000000E-06	0.1000000E+01	0.1000000E-04	25	15	100													
!	530	3500																						
0	SI	(103.1601)	AL	(34.9202)	FE	(9.5023)	MG	(5.0522)	MN	(0.1396)	CA	(0.8114)	NA	(6.3852)	K	(8.3496)	TI	(1.2310)	H	(60)0	(?)	* B-T	LS	MnNCKFMASHT
0	SI	(100.9833)	AL	(39.1212)	FE	(6.7135)	MG	(8.5351)	MN	(0.0699)	CA	(0.2155)	NA	(4.8403)	K	(8.0736)	TI	(1.0510)	H	(60)0	(?)	* B-T	BS	MnNCKFMASHT
0	SI	(104.0942)	AL	(35.6558)	FE	(7.7247)	MG	(6.8852)	MN	(0.0775)	CA	(0.2095)	NA	(4.8363)	K	(9.5227)	TI	(1.0173)	H	(60)0	(?)	* B-T	AP	MnNCKFMASHT

Appendix 9 - thermo data set.txt

25

O	AL	BA	C	CA	CL	CO
CU	F	FE	H	K	MN	MG
NA	NI	P	S	SI	SR	TI
ZN	ZR	B	E			
15.99940	26.98154	137.32700	12.01100	40.07800	35.45270	58.93320
63.54600	18.99840	55.84700	1.00794	39.09830	54.93085	24.30500
22.98977	58.69000	30.97362	32.06600	28.08550	87.62000	47.88000
65.39000	91.22400	10.81000	1.00000			
0.0	1.5	1.0	2.0	1.0	0.0	1.0
1.0	0.0	1.0	0.5	0.5	1.0	1.0
0.5	1.0	1.0	0.0	2.0	1.0	2.0
1.0	2.0	0.0	0.0			

! Appendix 9 of Pattison, JGS 2012

! Holland & Powell 5.5 dataset:

! tcds55.txt produced at 19:29:59 on 22 Nov 2003 (with sigma fit = 1.067)

! converted by D.K. Tinkham (convHPDset.exe) on Sun Apr 08 23:09:57 2007

! *****MINERAL DATA*****

forsterite				MG(2)SI(1)O(4)		fo	code
ST	0.0	-2172200.000	95.1000	4.3660			
C3	233.30000	0.0014940	-603800.0	-1869.700		0.00	
VHP	0.000061300	1250.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000187500				

fayalite				FE(2)SI(1)O(4)		fa	code
ST	0.0	-1478150.000	151.0000	4.6310			
C3	201.10000	0.0173300	-1960600.0	-900.900		0.00	
VHP	0.000050500	1330.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000199500				

tephroite				MN(2)SI(1)O(4)		teph	code
ST	0.0	-1732280.000	155.9000	4.8990			
C3	219.60000	0.0000000	-1292700.0	-1308.300		0.00	
VHP	0.000050500	1200.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000180000				

larn-bredigite				CA(2)SI(1)O(4)		larn	code
ST	0.0	-2307200.000	127.6000	5.1600			
C3	247.50000	-0.0032060	0.0	-2051.900		0.00	
VHP	0.000050500	1200.0	1710.0000	10.03		0.05000	
VH2	10.0000	4.0000	-0.000180000				

monticellite				CA(1)MG(1)SI(1)O(4)		mont	code
ST	0.0	-2253050.000	108.1000	5.1480			
C3	250.70000	-0.0104330	-797200.0	-1996.100		0.00	
VHP	0.000056300	1120.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000168000				

clinochroite				MG(9)SI(4)O(18)H(2)		chum	code
ST	0.0	-9607320.000	445.0000	19.7850			
C3	1070.00000	-0.0165330	-7899600.0	-7373.900		0.00	
VHP	0.000061000	1290.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000193500				

pyrope				MG(3)AL(2)SI(3)O(12)		py	code
ST	0.0	-6284720.000	266.3000	11.3180			
C3	633.50000	0.0000000	-5196100.0	-4315.200		0.00	
VHP	0.000043600	1737.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000260550				

almandine				FE(3)AL(2)SI(3)O(12)		alm	code
ST	0.0	-5263520.000	340.0000	11.5110			
C3	677.30000	0.0000000	-3772700.0	-5044.000		0.00	
VHP	0.000040300	1690.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000253500				

spessartine				MN(3)AL(2)SI(3)O(12)		spss	code
ST	0.0	-5646400.000	367.0000	11.7920			
C3	584.60000	-0.0015930	-7516700.0	-2750.100		0.00	
VHP	0.000046200	1790.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000268500				

grossular				CA(3)AL(2)SI(3)O(12)		gr	code
ST	0.0	-6644150.000	255.0000	12.5350			
C3	626.00000	0.0000000	-5779200.0	-4002.900		0.00	
VHP	0.000039300	1680.0	0.0000	0.00		0.00000	
VH2	10.0000	4.0000	-0.000252000				

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andradi te		CA(3)FE(2)SI(3)O(12)		andr		code
ST	0.0	-5768130.000	318.0000	13.2040		
C3	638.60000	0.0000000	-4955100.0	-3989.200		0.00
VHP	0.000039300	1590.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000238500			
osumilite_1		K(1)MG(2)AL(5)SI(10)O(30)		osm1		code
ST	0.0	-14968190.000	701.0000	37.8930		
C3	1625.80000	-0.0355480	-8063500.0	-13490.900		0.00
VHP	0.000007600	810.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000121500			
osumilite_2		K(1)MG(3)AL(3)SI(11)O(30)		osm2		code
ST	0.0	-14810340.000	724.0000	38.4400		
C3	1610.60000	-0.0344570	-8262100.0	-13128.800		0.00
VHP	0.000007600	810.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000121500			
Fe-osumilite		K(1)FE(2)AL(5)SI(10)O(30)		fosm		code
ST	0.0	-14248460.000	762.0000	38.3200		
C3	1656.00000	-0.0341630	-6497700.0	-14114.300		0.00
VHP	0.000008000	800.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000120000			
vesuvianite		CA(19)MG(2)AL(11)SI(18)O(78)H(9)		vsv		code
ST	0.0	-42352670.000	1890.0000	85.2000		
C3	4488.00000	-0.0579520	-22269300.0	-33478.000		0.00
VHP	0.000050000	1670.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000250500			
andalusite		AL(2)SI(1)O(5)		and		code
ST	0.0	-2588800.000	92.7000	5.1530		
C3	277.30000	-0.0065880	-1914100.0	-2265.600		0.00
VHP	0.000041100	1334.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000200100			
kyanite		AL(2)SI(1)O(5)		ky		code
ST	0.0	-2593110.000	83.5000	4.4140		
C3	279.40000	-0.0071240	-2055600.0	-2289.400		0.00
VHP	0.000040400	1590.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000238500			
sillimanite		AL(2)SI(1)O(5)		sill		code
ST	0.0	-2585680.000	95.5000	4.9860		
C3	280.20000	-0.0069000	-1375700.0	-2399.400		0.00
VHP	0.000022100	1320.0	2200.0000	4.00		0.03500
VH2	10.0000	4.0000	-0.000198000			
hydroxy-topaz		AL(2)SI(1)O(6)H(2)		tpz		code
ST	0.0	-2904980.000	100.5000	5.3390		
C3	387.70000	-0.0071200	-857200.0	-3744.200		0.00
VHP	0.000040400	1315.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000197250			
Mg-staurolite		MG(4)AL(18)SI(7.5)O(48)H(4)		mst		code
ST	0.0	-25101490.000	910.0000	44.2600		
C3	2820.50000	-0.0593660	-13774000.0	-24126.000		0.00
VHP	0.000012000	1200.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000180000			
Fe-staurolite		FE(4)AL(18)SI(7.5)O(48)H(4)		fst		code
ST	0.0	-23753930.000	1010.0000	44.8800		
C3	2880.00000	-0.0565950	-10642000.0	-25373.000		0.00
VHP	0.000012000	1200.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000180000			
Mn-staurolite		MN(4)AL(18)SI(7.5)O(48)H(4)		mnst		code
ST	0.0	-24203880.000	1024.0000	45.4600		
C3	2873.30000	-0.0890640	-12688000.0	-24749.000		0.00
VHP	0.000012000	1200.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000180000			
Mg-chloritoid		MG(1)AL(2)SI(1)O(7)H(2)		mctd		code
ST	0.0	-3551420.000	140.0000	6.8750		
C3	464.40000	-0.0126540	-1147200.0	-4341.000		0.00
VHP	0.000054200	1465.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000219750			
Fe-chloritoid		FE(1)AL(2)SI(1)O(7)H(2)		fctd		code
ST	0.0	-3215380.000	155.0000	6.9800		
C3	484.60000	-0.0138080	-198900.0	-4762.200		0.00
VHP	0.000054200	1465.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000219750			

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! -----					
Mn-chloritoid		MN(1)AL(2)SI(1)O(7)H(2)		mnctd	code
ST	0.0	-3329280.000	166.0000	7.1750	
C3	464.40000	-0.0126540	-1147200.0	-4341.000	0.00
VHP	0.000054200	1465.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000219750		
! -----					
merwinite		CA(3)MG(1)SI(2)O(8)		merw	code
ST	0.0	-4546420.000	253.1000	9.8470	
C3	417.50000	0.0081170	-2923000.0	-2320.300	0.00
VHP	0.000061500	1200.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000180000		
! -----					
spurrite		CA(5)SI(2)O(11)C(1)		spu	code
ST	0.0	-5849520.000	330.0000	14.6970	
C3	614.10000	-0.0035080	-2493100.0	-4168.000	0.00
VHP	0.000065000	950.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000142500		
! -----					
zoisite		CA(2)AL(3)SI(3)O(13)H(1)		zo	code
ST	0.0	-6898610.000	297.0000	13.5750	
C3	595.70000	0.0622970	-5921300.0	-3394.700	0.00
VHP	0.000067000	1120.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000168000		
! -----					
clinzoisite		CA(2)AL(3)SI(3)O(13)H(1)		cz	code
ST	0.0	-6898150.000	301.0000	13.6300	
C3	567.00000	0.0180630	-7034000.0	-2603.000	0.00
VHP	0.000046000	1120.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000168000		
! -----					
Fe-epidote		CA(2)FE(2)AL(1)SI(3)O(13)H(1)		fep	code
ST	0.0	-6002180.000	357.0000	14.1900	
C3	520.10000	0.0314990	-15426000.0	218.800	0.00
VHP	0.000050500	1294.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000199280		
! -----					
epidote		CA(2)FE(1)AL(2)SI(3)O(13)H(1)		ep	code
ST	0.0	-6463210.000	328.0000	13.9100	
C3	544.60000	0.0247810	-11230000.0	-1192.100	0.00
VHP	0.000050500	1233.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000184950		
! -----					
lawsonite		CA(1)AL(2)SI(2)O(10)H(4)		law	code
ST	0.0	-4869140.000	230.0000	10.1320	
C3	687.80000	0.0015660	375900.0	-7179.200	0.00
VHP	0.000058200	1014.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000152100		
! -----					
pumpellyite		CA(4)MG(1)AL(5)SI(6)O(28)H(7)		pump	code
ST	0.0	-14389500.000	629.0000	29.5500	
C3	1720.80000	-0.0249280	-5998700.0	-14620.300	0.00
VHP	0.000050000	1615.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000242250		
! -----					
gehlenite		CA(2)AL(2)SI(1)O(7)		geh	code
ST	0.0	-3986880.000	202.0000	9.0240	
C3	405.70000	-0.0070990	-1188300.0	-3174.400	0.00
VHP	0.000041700	1080.0	700.0000	11.00	0.09700
VH2	10.0000	4.0000	-0.000162000		
! -----					
akermanite		CA(2)MG(1)SI(2)O(7)		ak	code
ST	0.0	-3866360.000	212.5000	9.2540	
C3	385.40000	0.0032090	-247500.0	-2889.900	0.00
VHP	0.000050800	1420.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000213000		
! -----					
rankinite		CA(3)SI(2)O(7)		rnk	code
ST	0.0	-3944430.000	210.0000	9.6510	
C3	372.30000	-0.0028930	-2462400.0	-2181.300	0.00
VHP	0.000065000	950.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000142500		
! -----					
tilleyite		CA(5)SI(2)O(13)C(2)		ty	code
ST	0.0	-6368160.000	390.0000	17.0390	
C3	741.70000	-0.0053450	-1434600.0	-5878.500	0.00
VHP	0.000065000	950.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000142500		
! -----					
cordierite		MG(2)AL(4)SI(5)O(18)		crd	code
ST	0.0	-9163370.000	407.5000	23.3220	
C3	821.30000	0.0433390	-8211200.0	-5000.000	0.00
VHP	0.000007600	810.0	1800.0000	20.00	0.20000

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VH2	10.0000	4.0000	-0.000121500		

hyd. cordierite		MG(2)AL(4)SI(5)O(19)H(2)		hcrd	code
ST	0.0	-9446980.000	487.3000	23.3220	
C3	869.70000	0.0519950	-7723700.0	-5251.200	0.00
VHP	0.00007600	810.0	1800.0000	20.00	0.20000
VH2	10.0000	4.0000	-0.000121500		

Fe-cordierite		FE(2)AL(4)SI(5)O(18)		fcrd	code
ST	0.0	-8436070.000	475.0000	23.7100	
C3	851.50000	0.0447240	-6645000.0	-5623.400	0.00
VHP	0.00007600	810.0	1800.0000	20.00	0.20000
VH2	10.0000	4.0000	-0.000121500		

Mn-cordierite		MN(2)AL(4)SI(5)O(18)		mncrd	code
ST	0.0	-8681180.000	475.0000	24.0270	
C3	847.70000	0.0284900	-7668200.0	-5311.400	0.00
VHP	0.00007600	810.0	1800.0000	20.00	0.20000
VH2	10.0000	4.0000	-0.000121500		

phase-A		MG(7)SI(2)O(14)H(6)		phA	code
ST	0.0	-7130410.000	350.0000	15.4420	
C3	964.00000	-0.0115210	-4517800.0	-7724.700	0.00
VHP	0.000082600	1450.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000217500		

sphene		CA(1)TI(1)SI(1)O(5)		sph	code
ST	0.0	-2595550.000	131.2000	5.5650	
C3	233.70000	0.0040430	-2306500.0	-1207.600	0.00
VHP	0.000042000	1100.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000165000		

zircon		ZR(1)SI(1)O(4)		zrc	code
ST	0.0	-2032770.000	84.0300	3.9260	
C3	237.00000	-0.0178800	-149600.0	-2267.800	0.00
VHP	0.000022200	1160.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000174000		

enstatite		MG(2)SI(2)O(6)		en	code
ST	0.0	-3090470.000	132.5000	6.2620	
C3	356.20000	-0.0029900	-596900.0	-3185.300	0.00
VHP	0.000050500	1070.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000160500		

ferrosilite		FE(2)SI(2)O(6)		fs	code
ST	0.0	-2388630.000	190.6000	6.5920	
C3	398.70000	-0.0065790	1290100.0	-4058.000	0.00
VHP	0.000063200	1010.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000151500		

Mg-Tscher. pyx		MG(1)AL(2)SI(1)O(6)		mgts	code
ST	0.0	-3189320.000	131.0000	5.9000	
C3	371.40000	-0.0040820	-398400.0	-3547.100	0.00
VHP	0.000050800	1144.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000171600		

diopside		CA(1)MG(1)SI(2)O(6)		di	code
ST	0.0	-3202760.000	142.7000	6.6190	
C3	314.50000	0.0000410	-2745900.0	-2020.100	0.00
VHP	0.000057000	1223.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000183450		

hedenbergite		CA(1)FE(1)SI(2)O(6)		hed	code
ST	0.0	-2844160.000	174.2000	6.7950	
C3	340.20000	0.0008120	-1047800.0	-2646.700	0.00
VHP	0.000057000	1200.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000180000		

jadeite		NA(1)AL(1)SI(2)O(6)		jd	code
ST	0.0	-3027850.000	133.5000	6.0400	
C3	301.10000	0.0101430	-2239300.0	-2055.100	0.00
VHP	0.000046600	1284.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000192600		

acmite		NA(1)FE(1)SI(2)O(6)		acm	code
ST	0.0	-2586650.000	170.6000	6.4590	
C3	307.10000	0.0167580	-1685500.0	-2125.800	0.00
VHP	0.000046600	1060.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000159000		

Ca-Tscher. pyx		CA(1)AL(2)SI(1)O(6)		cats	code
ST	0.0	-3307030.000	138.0000	6.3560	
C3	347.60000	-0.0069740	-1781600.0	-2757.500	0.00

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VHP	0.000044300	1140.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000171000		
!-----					
rhodoni te		MN(1)SI(1)O(3)		rhod	code
ST	0.0	-1321750.000	100.5000	3.4940	
C3	138.40000	0.0040880	-1936000.0	-538.900	0.00
VHP	0.000050800	1250.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000187500		
!-----					
pyroxmangi te		MN(1)SI(1)O(3)		pxmn	code
ST	0.0	-1322530.000	99.3000	3.4720	
C3	138.40000	0.0040880	-1936000.0	-538.900	0.00
VHP	0.000050800	1250.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000187500		
!-----					
wollastoni te		CA(1)SI(1)O(3)		wo	code
ST	0.0	-1634060.000	82.5000	3.9930	
C3	159.30000	0.0000000	-967300.0	-1075.400	0.00
VHP	0.000046000	795.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000119250		
!-----					
ps-wollastoni te		CA(1)SI(1)O(3)		pswo	code
ST	0.0	-1627690.000	88.2000	4.0080	
C3	157.80000	0.0000000	-967300.0	-1075.400	0.00
VHP	0.000053900	1050.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000157500		
!-----					
tremolite		CA(2)MG(5)SI(8)O(24)H(2)		tr	code
ST	0.0	-12310380.000	550.0000	27.2700	
C3	1260.20000	0.0038300	-11455000.0	-8237.600	0.00
VHP	0.000053400	762.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000114300		
!-----					
ferroactinoli te		CA(2)FE(5)SI(8)O(24)H(2)		fact	code
ST	0.0	-10511240.000	705.0000	28.2800	
C3	1290.00000	0.0299910	-8447500.0	-8947.000	0.00
VHP	0.000053400	760.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000114000		
!-----					
tschermaki te		CA(2)MG(3)AL(4)SI(6)O(24)H(2)		ts	code
ST	0.0	-12541200.000	545.0000	26.8000	
C3	1244.80000	0.0243480	-11965000.0	-8112.100	0.00
VHP	0.000053400	760.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000114000		
!-----					
pargasi te		NA(1)CA(2)MG(4)AL(3)SI(6)O(24)H(2)		parg	code
ST	0.0	-12720650.000	601.0000	27.1900	
C3	1280.20000	0.0229970	-12359500.0	-8065.800	0.00
VHP	0.000053400	912.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000136800		
!-----					
glaucophane		NA(2)MG(3)AL(2)SI(8)O(24)H(2)		gl	code
ST	0.0	-11969470.000	535.0000	26.0500	
C3	1717.50000	-0.1210700	7075000.0	-19272.000	0.00
VHP	0.000053000	883.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000132450		
!-----					
Fe-glaucophane		NA(2)FE(3)AL(2)SI(8)O(24)H(2)		fgl	code
ST	0.0	-10889740.000	624.0000	26.5900	
C3	1762.90000	-0.1189920	9423700.0	-20207.100	0.00
VHP	0.000053000	890.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000133500		
!-----					
riebecki te		NA(2)FE(5)SI(8)O(24)H(2)		rieb	code
ST	0.0	-10035240.000	691.0000	27.4900	
C3	1746.90000	-0.1135720	9370300.0	-19468.700	0.00
VHP	0.000053000	890.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000133500		
!-----					
anthophyllite		MG(7)SI(8)O(24)H(2)		anth	code
ST	0.0	-12069200.000	536.0000	26.5400	
C3	1277.30000	0.0258250	-9704600.0	-9074.700	0.00
VHP	0.000050000	700.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000105000		
!-----					
Fe-anthophyllite		FE(7)SI(8)O(24)H(2)		fanth	code
ST	0.0	-9627230.000	725.0000	27.8700	
C3	1383.10000	0.0306690	-4224700.0	-11257.600	0.00
VHP	0.000050000	700.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000105000		
!-----					
cummingtoni te		MG(7)SI(8)O(24)H(2)		cumm	code
ST	0.0	-12057480.000	540.0000	26.3300	

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C3	1277.30000	0.0258250	-9704600.0	-9074.700	0.00
VHP	0.000050000	700.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000105000		
!					
gruneri te		FE(7)SI(8)O(24)H(2)		grun	code
ST	0.0	-9613200.000	730.0000	27.8400	
C3	1383.10000	0.0306690	-4224700.0	-11257.600	0.00
VHP	0.000050000	648.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000097200		
!					
gedri te		MG(5)AL(4)SI(6)O(24)H(2)		ged	code
ST	0.0	-12319430.000	515.0000	25.8000	
C3	1307.70000	0.0236420	-9307400.0	-9799.000	0.00
VHP	0.000048000	770.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000115500		
!					
sapphi ri ne(442)		MG(4)AL(8)SI(2)O(20)		spr4	code
ST	0.0	-11019620.000	443.0000	19.9050	
C3	1160.30000	-0.0243240	-7706600.0	-8974.200	0.00
VHP	0.000049000	1200.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000180000		
!					
sapphi ri ne(793)		MG(3.5)AL(9)SI(1.5)O(20)		spr7	code
ST	0.0	-11065630.000	448.0000	19.7750	
C3	1167.90000	-0.0248700	-7607300.0	-9155.300	0.00
VHP	0.000049000	1200.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000180000		
!					
Fe-sapph(793)		FE(3.5)AL(9)SI(1.5)O(20)		fspr	code
ST	0.0	-9835510.000	551.0000	20.3910	
C3	1257.80000	-0.0221710	-1664000.0	-11348.400	0.00
VHP	0.000049000	1200.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000180000		
!					
Mg-carphol i te		MG(1)AL(2)SI(2)O(10)H(4)		mcar	code
ST	0.0	-4781240.000	210.0000	10.5900	
C3	667.80000	-0.0125590	-1167100.0	-6440.000	0.00
VHP	0.000050000	525.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000078750		
!					
Fe-carphol i te		FE(1)AL(2)SI(2)O(10)H(4)		fcar	code
ST	0.0	-4413200.000	255.0000	10.6900	
C3	674.80000	-0.0100920	-715800.0	-6554.500	0.00
VHP	0.000050000	525.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000078750		
!					
deeri te		FE(18)SI(12)O(50)H(10)		deer	code
ST	0.0	-18347650.000	1650.0000	55.7400	
C3	3164.40000	-0.0278830	-5039100.0	-26721.000	0.00
VHP	0.000050000	630.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000094500		
!					
muscovi te		K(1)AL(3)SI(3)O(12)H(2)		mu	code
ST	0.0	-5984180.000	292.0000	14.0830	
C3	756.40000	-0.0198400	-2170000.0	-6979.200	0.00
VHP	0.000059600	490.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000073500		
!					
cel adoni te		K(1)MG(1)AL(1)SI(4)O(12)H(2)		cel	code
ST	0.0	-5842420.000	290.0000	13.9570	
C3	741.20000	-0.0187480	-2368800.0	-6616.900	0.00
VHP	0.000059600	700.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000105000		
!					
Fe-cel adoni te		K(1)FE(1)AL(1)SI(4)O(12)H(2)		fcel	code
ST	0.0	-5477430.000	329.0000	14.0700	
C3	756.30000	-0.0191470	-1586100.0	-6928.700	0.00
VHP	0.000059600	700.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000105000		
!					
paragoni te		NA(1)AL(3)SI(3)O(12)H(2)		pa	code
ST	0.0	-5946340.000	276.0000	13.2110	
C3	803.00000	-0.0315800	217000.0	-8151.000	0.00
VHP	0.000077400	550.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000082500		
!					
margari te		CA(1)AL(4)SI(2)O(12)H(2)		ma	code
ST	0.0	-6241230.000	267.0000	12.9640	
C3	744.40000	-0.0168000	-2074400.0	-6783.200	0.00
VHP	0.000048700	1300.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000195000		
!					
phl ogopi te		K(1)MG(3)AL(1)SI(3)O(12)H(2)		phl	code

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ST	0.0	-6219160.000	328.0000	14.9640	
C3	770.30000	-0.0369390	-2328900.0	-6531.600	0.00
VHP	0.000057900	513.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000076950		

anni te		K(1)FE(3)AL(1)SI(3)O(12)H(2)		ann	code
ST	0.0	-5151670.000	418.0000	15.4320	
C3	815.70000	-0.0348610	19800.0	-7466.700	0.00
VHP	0.000057900	513.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000076950		

Mn-bi oti te		K(1)MN(3)AL(1)SI(3)O(12)H(2)		mnbi	code
ST	0.0	-5462840.000	433.0000	15.2640	
C3	809.90000	-0.0592130	-1514400.0	-6998.700	0.00
VHP	0.000057900	513.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000076950		

eastoni te		K(1)MG(2)AL(3)SI(2)O(12)H(2)		east	code
ST	0.0	-6338170.000	318.0000	14.7380	
C3	785.50000	-0.0380310	-2130300.0	-6893.700	0.00
VHP	0.000057900	513.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000076950		

Na-phl ogopi te		NA(1)MG(3)AL(1)SI(3)O(12)H(2)		naph	code
ST	0.0	-6172820.000	318.0000	14.4500	
C3	773.50000	-0.0402290	-2597900.0	-6512.600	0.00
VHP	0.000057900	513.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000076950		

cli nochl ore		MG(5)AL(2)SI(3)O(18)H(8)		clin	code
ST	0.0	-8912410.000	430.5000	21.0900	
C3	1161.80000	0.0101330	-7657300.0	-9690.900	0.00
VHP	0.000039800	870.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000130500		

amesi te		MG(4)AL(4)SI(2)O(18)H(8)		ames	code
ST	0.0	-9034440.000	410.0000	20.5200	
C3	1177.00000	0.0090410	-7458700.0	-10053.000	0.00
VHP	0.000039800	870.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000130500		

Al-free-chl ori te		MG(6)SI(4)O(18)H(8)		afchl	code
ST	0.0	-8727380.000	428.0000	21.6600	
C3	1146.60000	0.0112250	-7855900.0	-9328.800	0.00
VHP	0.000039800	870.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000130500		

daphni te		FE(5)AL(2)SI(3)O(18)H(8)		daph	code
ST	0.0	-7134850.000	565.0000	21.3400	
C3	1237.40000	0.0135940	-3743000.0	-11250.000	0.00
VHP	0.000039800	870.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000130500		

Mn-chl ori te		MN(5)AL(2)SI(3)O(18)H(8)		mnchl	code
ST	0.0	-7666530.000	595.0000	22.5900	
C3	1227.80000	-0.0269900	-6299800.0	-10469.400	0.00
VHP	0.000039800	870.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000130500		

sudoi te		MG(2)AL(4)SI(3)O(18)H(8)		sud	code
ST	0.0	-8626160.000	404.0000	20.3000	
C3	1436.10000	-0.0487490	-2748500.0	-13764.000	0.00
VHP	0.000039800	870.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000130500		

Fe-sudoi te		FE(2)AL(4)SI(3)O(18)H(8)		fsud	code
ST	0.0	-7903900.000	462.0000	20.4000	
C3	1466.30000	-0.0473650	-1182800.0	-14388.000	0.00
VHP	0.000039800	870.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000130500		

pyrophyll i te		AL(2)SI(4)O(12)H(2)		prl	code
ST	0.0	-5640640.000	239.4000	12.8100	
C3	784.50000	-0.0429480	1251000.0	-8495.900	0.00
VHP	0.000075000	525.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000078750		

tal c		MG(3)SI(4)O(12)H(2)		ta	code
ST	0.0	-5897100.000	260.0000	13.6250	
C3	622.20000	0.0000000	-6385500.0	-3916.300	0.00
VHP	0.000037000	480.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000072000		

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Fe-talc						FE(3)SI(4)O(12)H(2)	fta	code
ST	0.0	-4802920.000	352.0000	14.2250				
C3	579.70000	0.0394940	-6459300.0	-3088.100			0.00	
VHP	0.000037000	480.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000072000					
!								
tschermak-talc						MG(2)AL(2)SI(3)O(12)H(2)	tats	code
ST	0.0	-5987990.000	259.0000	13.5100				
C3	549.50000	0.0363240	-8606600.0	-2515.300			0.00	
VHP	0.000037000	480.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000072000					
!								
kaolinite						AL(2)SI(2)O(9)H(4)	kao	code
ST	0.0	-4122180.000	203.7000	9.9340				
C3	436.70000	-0.0342950	-4055900.0	-2699.100			0.00	
VHP	0.000051000	645.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000096750					
!								
prehnite						CA(2)AL(2)SI(3)O(12)H(2)	pre	code
ST	0.0	-6203180.000	292.8000	14.0260				
C3	724.90000	-0.0138650	-2059000.0	-6323.900			0.00	
VHP	0.000051000	835.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000125250					
!								
chrysotile						MG(3)SI(2)O(9)H(4)	chr	code
ST	0.0	-4359030.000	221.3000	10.7460				
C3	624.70000	-0.0207700	-1721800.0	-5619.400			0.00	
VHP	0.000047000	525.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000078750					
!								
antigorite						MG(48)SI(34)O(147)H(62)	atg	code
ST	0.0	-71424310.000	3591.0000	175.4800				
C3	9621.00000	-0.0911830	-35941600.0	-83034.200			0.00	
VHP	0.000047000	525.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000078750					
!								
albite						NA(1)AL(1)SI(3)O(8)	ab	code
ST	0.0	-3934560.000	210.1000	10.0060				
C3	452.00000	-0.0133640	-1275900.0	-3953.600			0.00	
VHP	0.000045600	593.0	950.0000	16.00			0.12400	
VH2	10.0000	4.0000	-0.000088950					
!								
high-albite						NA(1)AL(1)SI(3)O(8)	abh	code
ST	0.0	-3924800.000	223.4000	10.1090				
C3	452.00000	-0.0133640	-1275900.0	-3953.600			0.00	
VHP	0.000045600	593.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000088950					
!								
microcline						K(1)AL(1)SI(3)O(8)	mic	code
ST	0.0	-3975110.000	216.0000	10.8920				
C3	448.80000	-0.0100750	-1007300.0	-3973.100			0.00	
VHP	0.000033500	574.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000086100					
!								
sanidine						K(1)AL(1)SI(3)O(8)	san	code
ST	0.0	-3964960.000	230.0000	10.9000				
C3	448.80000	-0.0100750	-1007300.0	-3973.100			0.00	
VHP	0.000033500	574.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000086100					
!								
anorthite						CA(1)AL(2)SI(2)O(8)	an	code
ST	0.0	-4233480.000	200.0000	10.0790				
C3	371.60000	0.0126150	-4110200.0	-2038.400			0.00	
VHP	0.000023800	919.0	2300.0000	11.00			0.05000	
VH2	10.0000	4.0000	-0.000137850					
!								
quartz						Si(1)O(2)	q	code
ST	0.0	-910830.000	41.5000	2.2688				
C3	110.70000	-0.0051890	0.0	-1128.300			0.00	
VHP	0.000006500	750.0	847.0000	4.95			0.11880	
VH2	10.0000	4.0000	-0.000112500					
!								
tridymite						Si(1)O(2)	trd	code
ST	0.0	-906690.000	46.1000	2.7000				
C3	97.90000	-0.0033500	-636200.0	-774.000			0.00	
VHP	0.000005000	750.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000112500					
!								
cristobalite						Si(1)O(2)	crst	code
ST	0.0	-905990.000	46.5000	2.6100				
C3	97.90000	-0.0033500	-636200.0	-774.000			0.00	
VHP	0.000008100	600.0	0.0000	0.00			0.00000	
VH2	10.0000	4.0000	-0.000090000					

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! -----						
coesi te		SI (1)0(2)		coe		code
ST	0.0	-905470.000	40.8000	2.0640		
C3	96.50000	-0.0005770	-444800.0	-798.200		0.00
VHP	0.000018000	1000.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000150000			
! -----						
stishovi te		SI (1)0(2)		stv		code
ST	0.0	-875630.000	24.5000	1.4014		
C3	68.10000	0.0060100	-1978200.0	-82.100		0.00
VHP	0.000025000	3160.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000474000			
! -----						
nepheli ne		NA(1)AL(1)SI (1)0(4)		ne		code
ST	0.0	-2095080.000	124.4000	5.4190		
C3	272.70000	-0.0123980	0.0	-2763.100		0.00
VHP	0.000081000	600.0	467.0000	10.00		0.08000
VH2	10.0000	4.0000	-0.000090000			
! -----						
kal silite		K(1)AL(1)SI (1)0(4)		kal s		code
ST	0.0	-2121920.000	134.0000	6.0400		
C3	242.00000	-0.0044820	-895800.0	-1935.800		0.00
VHP	0.000057600	590.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000088500			
! -----						
leucite		K(1)AL(1)SI (2)0(6)		lc		code
ST	0.0	-3029160.000	200.0000	8.8280		
C3	369.80000	-0.0163320	684700.0	-3683.100		0.00
VHP	0.000036700	630.0	938.0000	18.00		0.48200
VH2	10.0000	4.0000	-0.000094500			
! -----						
meionite		CA(4)AL(6)SI (6)0(27)C(1)		me		code
ST	0.0	-13843570.000	752.0000	33.9850		
C3	1359.00000	0.0364420	-8594700.0	-9598.200		0.00
VHP	0.000031600	870.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000130500			
! -----						
wairakite		CA(1)AL(2)SI (4)0(14)H(4)		wrk		code
ST	0.0	-6666420.000	375.0000	19.0400		
C3	838.30000	-0.0214600	-2272000.0	-7292.300		0.00
VHP	0.000023800	1000.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000150000			
! -----						
laumontite		CA(1)AL(2)SI (4)0(16)H(8)		lmt		code
ST	0.0	-7268470.000	457.0000	20.3700		
C3	1013.40000	-0.0214130	-2235800.0	-8806.700		0.00
VHP	0.000023800	1000.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000150000			
! -----						
heulandite		CA(1)AL(2)SI (7)0(24)H(12)		heu		code
ST	0.0	-10599140.000	669.0000	31.8000		
C3	1504.80000	-0.0332240	-2959300.0	-13297.200		0.00
VHP	0.000023800	1000.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000150000			
! -----						
stilbite		CA(1)AL(2)SI (7)0(25)H(14)		stlb		code
ST	0.0	-10898830.000	710.0000	32.8700		
C3	1588.40000	-0.0320430	-3071600.0	-13966.900		0.00
VHP	0.000023800	1000.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000150000			
! -----						
analcite		NA(1)AL(1)SI (2)0(7)H(2)		anl		code
ST	0.0	-3309900.000	232.0000	9.7400		
C3	643.50000	-0.0160670	9302300.0	-9179.600		0.00
VHP	0.000050000	400.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000060000			
! -----						
lime		CA(1)0(1)		lime		code
ST	0.0	-634950.000	38.1000	1.6764		
C3	52.40000	0.0036730	-750700.0	-51.000		0.00
VHP	0.000066500	1160.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000174000			
! -----						
rutile		Ti (1)0(2)		ru		code
ST	0.0	-944180.000	50.6000	1.8820		
C3	90.40000	0.0029000	0.0	-623.800		0.00
VHP	0.000044300	2225.0	0.0000	0.00		0.00000
VH2	10.0000	4.0000	-0.000333750			
! -----						
periclase		MG(1)0(1)		per		code
ST	0.0	-601600.000	26.9000	1.1250		
C3	60.50000	0.0003620	-535800.0	-299.200		0.00
VHP	0.000062000	1650.0	0.0000	0.00		0.00000

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VH2	10.0000	4.0000	-0.000247500		

manganosi te		MN(1)O(1)		mang	code
ST	0.0	-385150.000	59.7000	1.3221	
C3	59.80000	0.0036000	-31400.0	-282.600	0.00
VHP	0.000063000	1640.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000246000		

corundum		AL(2)O(3)		cor	code
ST	0.0	-1675250.000	50.9000	2.5580	
C3	139.50000	0.0058900	-2460600.0	-589.200	0.00
VHP	0.000041900	2520.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000378000		

hematite		FE(2)O(3)		hem	code
ST	0.0	-825710.000	87.4000	3.0274	
C3	163.90000	0.0000000	-2257200.0	-657.600	0.00
VHP	0.000059900	1996.0	955.0000	15.60	0.00000
VH2	10.0000	4.0000	-0.000299400		

nickel -oxi de		O(1)NI(1)		NiO	code
ST	0.0	-239440.000	38.0000	1.0970	
C3	47.70000	0.0078240	-392500.0	0.000	0.00
VHP	0.000062000	1650.0	520.0000	5.70	0.00000
VH2	10.0000	4.0000	-0.000247500		

pyrophanite		MN(1)TI(1)O(3)		pnt	code
ST	0.0	-1359240.000	104.9000	3.2880	
C3	141.90000	0.0033730	-1940700.0	-407.600	0.00
VHP	0.000049500	1770.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000265500		

geikielite		MG(1)TI(1)O(3)		geik	code
ST	0.0	-1567490.000	74.6000	3.0860	
C3	151.00000	0.0000000	-1890400.0	-652.200	0.00
VHP	0.000049500	1770.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000265500		

ilmenite		FE(1)TI(1)O(3)		ilm	code
ST	0.0	-1231300.000	108.9000	3.1690	
C3	138.90000	0.0050810	-1288800.0	-463.700	0.00
VHP	0.000049500	1770.0	1900.0000	11.00	0.02000
VH2	10.0000	4.0000	-0.000265500		

baddelyite		ZR(1)O(2)		bdy	code
ST	0.0	-1101030.000	50.4000	2.1150	
C3	90.70000	0.0000000	-813300.0	-438.800	0.00
VHP	0.000037600	2225.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000333750		

spinel		MG(1)AL(2)O(4)		sp	code
ST	0.0	-2300720.000	81.5000	3.9780	
C3	242.70000	-0.0060370	-2315100.0	-1678.100	0.00
VHP	0.000043100	1945.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000291750		

hercynite		FE(1)AL(2)O(4)		herc	code
ST	0.0	-1959150.000	107.5000	4.0750	
C3	283.30000	-0.0053760	609800.0	-2713.600	0.00
VHP	0.000039500	2120.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000318000		

magnetite		FE(3)O(4)		mt	code
ST	0.0	-1115510.000	146.1000	4.4520	
C3	262.50000	-0.0072040	-1926200.0	-1655.700	0.00
VHP	0.000069600	1850.0	848.0000	35.00	0.00000
VH2	10.0000	4.0000	-0.000277500		

magnesi oferri te		FE(2)MG(1)O(4)		mft	code
ST	0.0	-1440660.000	126.5000	4.4570	
C3	217.90000	0.0003550	-3108000.0	-745.900	0.00
VHP	0.000069600	1850.0	665.0000	12.90	0.00000
VH2	10.0000	4.0000	-0.000277500		

ulvospinel		FE(2)TI(1)O(4)		usp	code
ST	0.0	-1497490.000	175.0000	4.6820	
C3	-102.60000	0.1425200	-9144500.0	5270.700	0.00
VHP	0.000069000	1850.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000277500		

brucite		MG(1)O(2)H(2)		br	code
ST	0.0	-924920.000	64.5000	2.4630	
C3	158.40000	-0.0040760	-1052300.0	-1171.300	0.00

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VHP	0.000130000	485.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000072750		
! -----					
di aspo re		AL(1)O(2)H(1)		dsp	code
ST	0.0	-999470.000	35.0000	1.7760	
C3	145.10000	0.0087090	584400.0	-1741.100	0.00
VHP	0.000079700	2300.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000345000		
! -----					
go ethi te		FE(1)O(2)H(1)		gth	code
ST	0.0	-561650.000	60.4000	2.0820	
C3	139.30000	0.0001470	-212700.0	-1077.800	0.00
VHP	0.000079700	2300.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000345000		
! -----					
cal ci te		CA(1)O(3)C(1)		cc	code
ST	0.0	-1207470.000	92.5000	3.6890	
C3	140.90000	0.0050290	-950700.0	-858.400	0.00
VHP	0.000044000	760.0	1240.0000	10.00	0.04000
VH2	10.0000	4.0000	-0.000114000		
! -----					
ar ago ni te		CA(1)O(3)C(1)		arag	code
ST	0.0	-1207580.000	89.5000	3.4150	
C3	192.30000	-0.0030520	1149700.0	-2118.300	0.00
VHP	0.000115000	650.0	1240.0000	9.00	0.04000
VH2	10.0000	4.0000	-0.000097500		
! -----					
ma gne si te		MG(1)O(3)C(1)		mag	code
ST	0.0	-1111360.000	65.1000	2.8030	
C3	186.40000	-0.0037720	0.0	-1886.200	0.00
VHP	0.000064800	1460.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000219000		
! -----					
si de ri te		FE(1)O(3)C(1)		si d	code
ST	0.0	-761440.000	95.0000	2.9380	
C3	168.40000	0.0000000	0.0	-1483.600	0.00
VHP	0.000110000	1200.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000180000		
! -----					
rho do chro si te		MN(1)O(3)C(1)		rhc	code
ST	0.0	-891090.000	98.0000	3.1070	
C3	169.50000	0.0000000	0.0	-1534.300	0.00
VHP	0.000065000	800.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000120000		
! -----					
do lo mi te		CA(1)MG(1)O(6)C(2)		dol	code
ST	0.0	-2324430.000	156.0000	6.4340	
C3	358.90000	-0.0049050	0.0	-3456.200	0.00
VHP	0.000063500	900.0	1373.0000	13.00	0.01500
VH2	10.0000	4.0000	-0.000135000		
! -----					
an ke ri te		CA(1)FE(1)O(6)C(2)		ank	code
ST	0.0	-1971270.000	187.0000	6.6060	
C3	341.00000	-0.0011610	0.0	-3054.800	0.00
VHP	0.000063500	900.0	1273.0000	9.00	0.01000
VH2	10.0000	4.0000	-0.000135000		
! -----					
sy l vi te		K(1)CL(1)		syv	code
ST	0.0	-436500.000	82.6000	3.7520	
C3	46.20000	0.0179700	0.0	0.000	0.00
VHP	0.000247000	170.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000025500		
! -----					
hal i te		NA(1)CL(1)		hl t	code
ST	0.0	-411300.000	72.1000	2.7020	
C3	45.20000	0.0179700	0.0	0.000	0.00
VHP	0.000269000	240.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000036000		
! -----					
i ron		FE(1)		i ron	code
ST	0.0	-0.000	27.3200	0.7092	
C3	46.20000	0.0051580	723100.0	-556.200	0.00
VHP	0.000074600	1680.0	1042.0000	8.30	0.00000
VH2	10.0000	4.0000	-0.000252000		
! -----					
ni ckel		NI(1)		Ni	code
ST	0.0	0.000	29.8700	0.6588	
C3	49.80000	0.0000000	585900.0	-533.900	0.00
VHP	0.000088600	1870.0	631.0000	3.00	0.00000
VH2	10.0000	4.0000	-0.000280500		
! -----					
gra phi te		C(1)		gph	code
ST	0.0	0.000	5.8500	0.5298	

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C3	51.00000	-0.0044280	488600.0	-805.500	0.00
VHP	0.000048400	390.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000058500		
! -----					
di amond		C(1)		di am	code
ST	0.0	2070.000	2.3000	0.3417	
C3	24.30000	0.0062720	-377400.0	-273.400	0.00
VHP	0.000016500	5800.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000870000		
! -----					
***** GAS DATA *****					
water. fluid		O(1)H(2)		H2O	code
SPC	HHP98				
ST	0.0	-241810.000	188.8000	0.0000	
C3	40.10000	0.0086560	487500.0	-251.200	0.00
VHP	0.000000000	0.0	0.0000	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		
! -----					
carbon. di oxide		O(2)C(1)		CO2	code
SPC	CHP98				
ST	0.0	-393510.000	213.7000	0.0000	
C3	87.80000	-0.0026440	706400.0	-998.900	0.00
VHP	0.000000000	0.0	0.0000	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		
! -----					
carbon. monoxide		O(1)C(1)		CO	code
ST	0.0	-110530.000	197.6700	0.0000	
C3	45.70000	-0.0000970	662700.0	-414.700	0.00
VHP	0.000000000	0.0	0.0000	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		
! -----					
methane		H(4)C(1)		CH4	code
ST	0.0	-74810.000	186.2600	0.0000	
C3	150.10000	0.0020620	3427700.0	-2650.400	0.00
VHP	0.000000000	0.0	0.0000	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		
! -----					
oxygen		O(2)		O2	code
ST	0.0	-0.000	205.2000	0.0000	
C3	48.30000	-0.0006910	499200.0	-420.700	0.00
VHP	0.000000000	0.0	0.0000	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		
! -----					
hydrogen		H(2)		H2	code
ST	0.0	0.000	130.7000	0.0000	
C3	23.30000	0.0046270	0.0	76.300	0.00
VHP	0.000000000	0.0	0.0000	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		
! -----					
sylvite.liq		K(1)CL(1)		syvL	code
ST	0.0	-416490.000	95.3000	3.8570	
C3	66.90000	0.0000000	0.0	0.000	0.00
VHP	0.000500000	59.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000008850		
! -----					
halite.liq		NA(1)CL(1)		hl tL	code
ST	0.0	-393420.000	79.7000	2.9650	
C3	72.00000	-0.0032230	0.0	0.000	0.00
VHP	0.000500000	66.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000009900		
! -----					
forsterite.liq		MG(2)SI(1)O(4)		FoL	code
ST	0.0	-2225160.000	-55.0000	4.2430	
C3	267.90000	0.0000000	0.0	0.000	0.00
VHP	0.000145000	730.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000109500		
! -----					
fayalite.liq		FE(2)SI(1)O(4)		FaL	code
ST	0.0	-1459210.000	102.5000	4.6950	
C3	239.70000	0.0000000	0.0	0.000	0.00
VHP	0.000169000	410.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000061500		
! -----					
silimantite.liq		AL(2)SI(1)O(5)		si lL	code
ST	0.0	-2583100.000	39.0000	6.4190	
C3	237.60000	0.0000000	0.0	0.000	0.00
VHP	0.000010000	300.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000045000		
! -----					
anorthite.liq		CA(1)AL(2)SI(2)O(8)		anL	code
ST	0.0	-4257750.000	52.0000	10.2060	
C3	417.50000	0.0000000	0.0	0.000	0.00
VHP	0.000049000	200.0	0.0000	0.00	0.00000

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VH2	10.0000	4.0000	-0.000030000		

H2O.liq		O(1)H(2)		h2oL	code
ST	0.0	-295710.000	45.5000	1.4140	
C3	80.00000	0.0000000	0.0	0.000	0.00
VHP	0.001079000	40.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000006000		

enstatite.liq		MG(2)SI(2)O(6)		enL	code
ST	0.0	-3091760.000	-2.0000	6.9000	
C3	354.90000	0.0000000	0.0	0.000	0.00
VHP	0.000129000	260.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000039000		

K-feldspar.liq		K(1)AL(1)SI(3)O(8)		kspL	code
ST	0.0	-3992670.000	129.5000	11.4680	
C3	367.30000	0.0000000	0.0	0.000	0.00
VHP	0.000060000	260.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000039000		

Silica.liq		SI(1)O(2)		qL	code
ST	0.0	-920850.000	16.5000	2.6400	
C3	82.50000	0.0000000	0.0	0.000	0.00
VHP	-0.000005000	470.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000070500		

dioptide.liq		CA(1)MG(1)SI(2)O(6)		diL	code
ST	0.0	-3208180.000	23.8000	7.3400	
C3	345.30000	0.0000000	0.0	0.000	0.00
VHP	0.000129000	300.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000045000		

albite.liq		NA(1)AL(1)SI(3)O(8)		abL	code
ST	0.0	-3934370.000	145.0000	10.7100	
C3	358.50000	0.0000000	0.0	0.000	0.00
VHP	0.000045000	390.0	0.0000	0.00	0.00000
VH2	10.0000	4.0000	-0.000058500		

H+.aq		H(1)E(-1)		H+	code
ST	0.0	0.000	0.0000	0.0000	
C3	0.00000	0.0000000	0.0	0.000	0.00
VHP	0.000000000	0.0	0.0000	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		

Cl-.aq		CL(1)E(1)		Cl-	code
ST	0.0	-167080.000	56.7300	1.7790	
C3	0.00000	0.0000000	0.0	0.000	0.00
VHP	0.000000000	0.0	-0.1414	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		

OH-.aq		O(1)H(1)E(1)		OH-	code
ST	0.0	-230020.000	-10.7100	-0.4180	
C3	0.00000	0.0000000	0.0	0.000	0.00
VHP	0.000000000	0.0	-0.1372	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		

Na+.aq		NA(1)E(-1)		Na+	code
ST	0.0	-240300.000	58.4000	-0.1110	
C3	0.00000	0.1913000	0.0	0.000	0.00
VHP	0.000000000	0.0	0.0306	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		

K+.aq		K(1)E(-1)		K+	code
ST	0.0	-252170.000	101.0400	0.9060	
C3	0.00000	0.0727000	0.0	0.000	0.00
VHP	0.000000000	0.0	0.0072	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		

Ca++.aq		CA(1)E(-2)		Ca++	code
ST	0.0	-543300.000	-56.5000	-1.8060	
C3	0.00000	-0.0690000	0.0	0.000	0.00
VHP	0.000000000	0.0	-0.0463	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		

Mg++.aq		MG(1)E(-2)		Mg++	code
ST	0.0	-465960.000	-138.1000	-2.1550	
C3	0.00000	-0.0462000	0.0	0.000	0.00
VHP	0.000000000	0.0	-0.0265	0.00	0.00000
VH2	0.0000	0.0000	0.000000000		

Fe++.aq		FE(1)E(-2)		Fe++	code
ST	0.0	-90420.000	-107.1100	-2.2200	
C3	0.00000	0.0000000	0.0	0.000	0.00

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VHP	0.00000000	0.0	-0.0339	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
Al+++ .aq		AL(1)E(-3)		Al+++	code
ST	0.0	-527230.000	-316.3000	-4.4400	
C3	0.00000	0.0000000	0.0	0.000	0.00
VHP	0.00000000	0.0	-0.1427	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
CO3-- .aq		O(3)C(1)E(2)		CO3--	code
ST	0.0	-675230.000	-50.0000	-0.5020	
C3	0.00000	0.0000000	0.0	0.000	0.00
VHP	0.00000000	0.0	-0.2908	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
AlOH3 .aq		AL(1)O(3)H(3)		AlOH3	code
ST	0.0	-1251850.000	53.6000	0.0000	
C3	0.00000	0.0000000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.1015	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
AlOH4- .aq		AL(1)O(4)H(4)E(1)		AlOH4-	code
ST	0.0	-1495780.000	126.9000	0.0000	
C3	0.00000	0.0000000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.0965	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
KOH .aq		K(1)O(1)H(1)		KOH	code
ST	0.0	-473620.000	109.6200	-0.8000	
C3	0.00000	0.0945000	0.0	0.000	0.00
VHP	0.00000000	0.0	-0.0293	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
HCl .aq		H(1)CL(1)		HCl	code
ST	0.0	-162130.000	56.7300	1.7790	
C3	0.00000	0.0903000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.0540	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
KCl .aq		K(1)CL(1)		KCl	code
ST	0.0	-400030.000	184.8100	4.4090	
C3	0.00000	0.0543000	0.0	0.000	0.00
VHP	0.00000000	0.0	-0.0380	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
NaCl .aq		NA(1)CL(1)		NaCl	code
ST	0.0	-399880.000	126.0900	2.2260	
C3	0.00000	0.1913000	0.0	0.000	0.00
VHP	0.00000000	0.0	-0.0020	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
CaCl2 .aq		CA(1)CL(2)		CaCl2	code
ST	0.0	-877060.000	46.0000	3.2600	
C3	0.00000	0.1369000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.0343	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
CaCl+ .aq		CA(1)CL(1)E(-1)		CaCl+	code
ST	0.0	-701280.000	27.3600	0.5740	
C3	0.00000	-0.0690000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.0400	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
MgCl2 .aq		MG(1)CL(2)		MgCl2	code
ST	0.0	-796080.000	-22.4300	2.9200	
C3	0.00000	0.2399000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.0186	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
MgCl+ .aq		MG(1)CL(1)E(-1)		MgCl+	code
ST	0.0	-632480.000	-81.3700	0.1260	
C3	0.00000	-0.0462000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.1126	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
FeCl2 .aq		FE(1)CL(2)		FeCl2	code
ST	0.0	-375340.000	109.8800	2.7000	
C3	0.00000	0.4503000	0.0	0.000	0.00
VHP	0.00000000	0.0	0.0124	0.00	0.00000
VH2	0.0000	0.0000	0.00000000		
!-----					
SiO2 .aq		SI(1)O(2)		aqSi	code
ST	0.0	-887940.000	46.3500	1.8320	

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C3 0.00000 0.1775000 0.0 0.000 0.00
VHP 0.00000000 0.0 0.0283 0.00 0.00000
VH2 0.0000 0.0000 0.00000000

!-----
*****MINERAL DATA*****
tschermaki teDQF1 SI(6)AL(4)MG(3)CA(2)O(24)H(2) tsDQF1
ST 0.0 1000.000 3.5000 0.0000
COM tschermaki te[1]

!-----
!al bi te(4ss) NA(1)AL(1)SI(3)O(8) al b4ss
! ST 0.0 0.0000 0.0000 0.0000
! COM al bi te[1]

!-----
hi gh-al bi te(4ss) NA(1)AL(1)SI(3)O(8) hal b4ss
ST 0.0 0.0000 0.0000 0.0000
COM hi gh-al bi te[1]

!-----
anorthi teC1_1 CA(1)AL(2)SI(2)O(8) anc1_1 nh
ST 0.0 6010.000 3.5000 0.0000
COM anorthi te[1]

!-----
anorthi teC1_2 CA(1)AL(2)SI(2)O(8) anc1_2 nh
ST 0.0 7030.000 4.6600 0.0000
COM anorthi te[1]

!-----
famechl_d FE(4)AL(4)SI(2)O(18)H(8) famechl_d
ST 0.0 00000.000 0.0000 0.0000
COM amesi te[1]daphni te[4/5]cl i nochl ore[-4/5]
fafchl_d FE(6)SI(4)O(18)H(8) fafchl_d
ST 0.0 00000.000 0.0000 0.0000
COM Al-free-chl ori te[1]daphni te[6/5]cl i nochl ore[-6/5]
mnameschl_d MN(4)AL(4)SI(2)O(18)H(8) mnameschl_d
ST 0.0 00000.000 0.0000 0.0000
COM amesi te[1]Mn-chl ori te[4/5]cl i nochl ore[-4/5]
mnafchl_d MN(6)SI(4)O(18)H(8) mnafchl_d
ST 0.0 00000.000 0.0000 0.0000
COM Al-free-chl ori te[1]Mn-chl ori te[6/5]cl i nochl ore[-6/5]

!-----
***** SOLUTION DATA ***** HPFspMM
! NOTE: This is what I tested in tcalc for Nelson, Oct. 31, 2007
FspMM (MARGULES, SI TE) A(1): K, Na, Ca
sani di ne K 0.3784 0 0
hi gh-al bi te(4ss) Na 0.2433 0 0
anorthi teC1_2 Ca 0.3784 0 0
***** MARGULES PARAMETER *****
sani di ne - hi gh-al bi te(4ss)
12 25100. 10.80 0.338
sani di ne - anorthi teC1_2
12 40000. 0.00 0.00
hi gh-al bi te(4ss) - anorthi teC1_2
12 3100. 0.00 0.00

!-----
***** SOLUTION DATA ***** whi temi ca
WM (-SITE, MARGULES) A(1): K, vac, Na - M2A(1): Al, Mg, Fe - T1(2): Al, Si
muscovi te K - Al - Al, Si 0.63 0 0
pyrophyll i te vac - Al - Si, Si 0.50 0 0
paragoni te Na - Al - Al, Si 0.37 0 0
cel adoni te K - Mg - Si, Si 0.63 0 0
Fe-cel adoni te K - Fe - Si, Si 0.63 0 0

***** MARGULES PARAMETER *****
muscovi te - pyrophyll i te
12 20000. 0.0 0.200
muscovi te - paragoni te
12 10120. -3.4 0.353
muscovi te - cel adoni te
12 00000. 0.0 0.200
muscovi te - Fe-cel adoni te
12 00000. 0.0 0.200
pyrophyll i te - paragoni te
12 20000. 0.0 0.200
pyrophyll i te - cel adoni te
12 25000. 0.0 0.200
pyrophyll i te - Fe-cel adoni te
12 25000. 0.0 0.200
paragoni te - cel adoni te
12 52000. 0.0 0.000
paragoni te - Fe-cel adoni te
12 52000. 0.0 0.000

!-----
***** SOLUTION DATA ***** garnet

```

Grt (MARGULES, SITE) M(3): Ca, Mg, Fe, Mn
grossular Ca, Ca, Ca
pyrope Mg, Mg, Mg
almandine Fe, Fe, Fe
spessartine Mn, Mn, Mn
***** MARGULES PARAMETER *****
grossular - pyrope
12 33000. 0.00 0.00
pyrope - almandine
12 2500. 0.00 0.00
pyrope - spessartine
12 4500. 0.00 0.00
! -----
!
***** SOLUTION DATA ***** chl r
Chl (SITE, MARGULES) M23(4): Mg, Fe, Mn - M1(1): Mg, Fe, Mn, Al - M4(1): Mg, Fe, Mn, Al - T1(2): Si, Al
Al-free-chlorite Mg, Mg, Mg, Mg - Mg - Mg - Si, Si
clinocl ore Mg, Mg, Mg, Mg - Mg - Al - Al, Si
daphnite Fe, Fe, Fe, Fe - Fe - Al - Al, Si
Mn-chlorite Mn, Mn, Mn, Mn - Mn - Al - Al, Si
amesite Mg, Mg, Mg, Mg - Al - Al - Al, Al
***** MARGULES PARAMETER ***** chl r
Al-free-chlorite - clinocl ore
12 18000.0 0.0 0.0
Al-free-chlorite - daphnite
12 14500.0 0.0 0.0
Al-free-chlorite - amesite
12 20000.0 0.0 0.0
clinocl ore - daphnite
12 2500.0 0.0 0.0
clinocl ore - amesite
12 18000.0 0.0 0.0
! daphnite - Mn-chlorite
! 12 0.0 0.0 0.0
daphnite - amesite
12 13500.0 0.0 0.0
! -----
!
***** MINERAL DATA ***** tibi
Ti-biotite K(1)MG(1)TI(1)AL(1)SI(3)O(12)H(2) tibi 0.0000 2nh
ST 0.0 45000.000 0.0000
COM phlogopite[1]rutile[1]quartz[1]forsterite[-1]
***** MINERAL DATA ***** biotite
obiotite K(1)MG(2)FE(1)AL(1)SI(3)O(12)H(2) obi 0.0000 2nh
ST 0.0 -10730.000 0.0000
COM phlogopite[2/3]annite[1/3]
!
***** SOLUTION DATA ***** tbi o
Tbi (-SITE, MARGULES) M2(2): Mg, Fe, Mn, vc - M1(1): Mg, Fe, Al, Mn, Ti - T1(2): Si, Al
phlogopite Mg, Mg - Mg - Al, Si
annite Fe, Fe - Fe - Al, Si
eastonite Mg, Mg - Al - Al, Al
obiotite Mg, Mg - Fe - Al, Si
Mn-biotite Mn, Mn - Mn - Al, Si
Ti-biotite Mg, vc - Ti - Al, Si
!
***** MARGULES PARAMETER *****
phlogopite - annite
12 9000.0 0.0 0.0
phlogopite - eastonite
12 10000.0 0.0 0.0
phlogopite - obiotite
12 3000.0 0.0 0.0
annite - eastonite
12 -1000.0 0.0 0.0
annite - obiotite
12 6000.0 0.0 0.0
eastonite - obiotite
12 10000.0 0.0 0.0
Ti-biotite - annite
12 12000.0 0.0 0.0
Ti-biotite - phlogopite
12 -10000.0 0.0 0.0
! -----
!
***** SOLUTION DATA ***** chtd
Ctd (SITE, MARGULES) M(1): Mg, Fe, Mn
Mg-chloritoid Mg
Fe-chloritoid Fe
Mn-chloritoid Mn
***** MARGULES PARAMETER *****
Mg-chloritoid - Fe-chloritoid
12 1000. 0.00 0.00

```

```

! -----
!
***** SOLUTION DATA *****
St (SITE,MARGULES) M(4): Fe, Mg, Mn
Mg-staurolite Mg, Mg, Mg, Mg
Fe-staurolite Fe, Fe, Fe, Fe
Mn-staurolite Mn, Mn, Mn, Mn
***** MARGULES PARAMETER *****
Mg-staurolite - Fe-staurolite
12 -8000.0 0.0 0.0
! -----
!
***** SOLUTION DATA *****
Crd (-SITE) M(2): Fe, Mg, Mn - B(1): n, h
cordierite Mg, Mg - n
Fe-cordierite Fe, Fe - n
Mn-cordierite Mn, Mn - n
hyd.cordierite Mg, Mg - h
! -----
!
***** SOLUTION DATA ***** ilm
Ilm (SITE) M(1): Mg, Fe, Mn
ilmenite Mg
geikielite Fe
pyrophanite Mn
!
*****MINERAL DATA*****
forsterite8.liq MG(4)SI(2)O(8) foL8 nhl 0.0000
ST 0.0 -10000.000 00.0000 0.0000
COM forsterite.liq[2] 0 forsterite.liq
fayalite8.liq FE(4)SI(2)O(8) faL8 nhl -1.3000
ST 0.0 -9000.000 00.0000 -1.3000
COM fayalite.liq[2] 0 fayalite.liq
sillimanite8.liq AL(3.2)SI(1.6)O(8) silL8 nhl 0.0000
ST 0.0 -10000.000 00.0000 0.0000
COM sillimanite.liq[1.6] 0 sillimanite.liq
Silica8.liq SI(4)O(8) qL8 nhl 0.0000
ST 0.0 0000.000 00.0000 0.0000
COM Silica.liq[4] 0 Silica.liq
!
***** SOLUTION DATA *****
LIQtC (EXT,MARGULES)
Silica8.liq
albite.liq
K-feldspar.liq
anorthite.liq
sillimanite8.liq
forsterite8.liq
fayalite8.liq
H2O.liq
***** MARGULES PARAMETER *****
Silica8.liq - albite.liq
12 12000.0 0.0 -0.40
Silica8.liq - K-feldspar.liq
12 -2000.0 0.0 -0.50
Silica8.liq - anorthite.liq
12 -10000.0 0.0 0.00
Silica8.liq - sillimanite8.liq
12 12000.0 0.0 0.00
Silica8.liq - forsterite8.liq
12 12000.0 0.0 -0.40
Silica8.liq - fayalite8.liq
12 14000.0 0.0 0.00
Silica8.liq - H2O.liq
12 15000.0 0.0 0.00
!
albite.liq - K-feldspar.liq
12 -6000.0 0.0 3.00
albite.liq - sillimanite8.liq
12 12000.0 0.0 0.00
albite.liq - forsterite8.liq
12 10000.0 0.0 0.00
albite.liq - fayalite8.liq
12 2000.0 0.0 0.00
albite.liq - H2O.liq
12 1000.0 0.0 -0.20
!
K-feldspar.liq - anorthite.liq
12 0.0 0.0 -1.00
K-feldspar.liq - sillimanite8.liq
12 12000.0 0.0 0.00
K-feldspar.liq - forsterite8.liq
12 12000.0 0.0 0.00

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K-feldspar.liq - fayalite8.liq

12 12000.0 0.0 0.00

K-feldspar.liq - H2O.liq

12 11000.0 0.0 -0.45

!

anorthite.liq - H2O.liq

12 9000.0 0.0 -0.85

!

sillimanite8.liq - forsterite8.liq

12 12000.0 0.0 0.00

sillimanite8.liq - fayalite8.liq

12 12000.0 0.0 0.00

sillimanite8.liq - H2O.liq

12 16000.0 0.0 0.00

!

forsterite8.liq - fayalite8.liq

12 18000.0 0.0 0.00

forsterite8.liq - H2O.liq

12 11000.0 0.0 -0.50

!

fayalite8.liq - H2O.liq

12 12000.0 0.0 0.00