APPENDIX C

COMPOSITION OF CLINOPYROXENE, PLAGIOCLASE AND CR-SPINEL IN SAMPLES FROM THE WILD ROGUE WILDERNESS, SW OREGON (ELECTRON MICROPROBE ANALYSIS)

Table C1: Microprobe analysis of clinopyroxene in O/C-325

deformed dike (porphyritic), sheeted dike complex (see table A3)

Analysis	11	12	13	14	15
Location	3	3	4	4	4
SiO_2	53.75	53.83	52.51	53.62	53.27
TiO_2	0.16	0.19	0.24	0.17	0.15
Al_2O_3	1.84	1.70	2.30	1.51	1.64
FeO*	4.12	3.96	5.36	5.12	4.57
Cr_2O_3	0.90	0.78	0.75	0.61	0.80
MgO	18.40	18.25	17.29	18.73	17.94
CaO	20.21	21.02	20.57	19.47	20.60
Na_2O	0.21	0.25	0.20	0.19	0.22
Total	99.59	99.98	99.22	99.42	99.19
Si	1.960	1.955	1.933	1.960	1.955
Al	0.079	0.073	0.099	0.065	0.071
Ti	0.004	0.005	0.007	0.005	0.004
Fe^{3+}	0.000	0.001	0.014	0.002	0.004
Fe^{2+}	0.126	0.119	0.151	0.155	0.137
Cr	0.026	0.022	0.022	0.018	0.023
Mg	1.000	0.988	0.948	1.020	0.981
Ca	0.790	0.818	0.811	0.762	0.810
Na	0.015	0.018	0.014	0.013	0.016
Sum	4.000	3.999	3.999	4.000	4.001
WO	41.2	42.5	42.1	39.3	41.9
EN	52.2	51.3	49.3	52.6	50.8
FS	6.6	6.2	8.6	8.1	7.3

Data obtained by G.D. Harper

Table C2: Microprobe analysis of clinopyroxene in O/C-81a

cpx + plag ± ol phyric basalt, Mule Mountain volcanics (see table A5)

Analysis	11	17	18	3.1	3.2	4.1	4.2
Location	5	3	3	8	8	8	8
SiO_2	53.91	53.09	53.29	53.47	53.47	52.62	52.62
TiO_2	0.07	0.10	0.17	0.10	0.10	0.24	0.24
Al_2O_3	1.47	1.61	1.95	1.88	1.88	2.44	2.44
FeO*	3.63	3.69	5.98	3.51	3.51	6.28	6.28
Cr_2O_3	0.53	0.45	0.19	0.74	0.74	0.29	0.29
MgO	17.68	17.41	17.41	17.53	17.53	16.71	16.71
CaO	22.63	22.76	19.99	22.25	22.25	20.57	20.57
Na_2O	0.10	0.11	0.13	0.12	0.12	0.17	0.17
Total	100.02	99.22	99.11	99.60	99.60	99.32	99.32
Si	1.961	1.947	1.965	1.954	1.954	1.941	1.941
Al	0.063	0.070	0.084	0.080	0.080	0.106	0.106
Ti	0.002	0.003	0.005	0.003	0.003	0.007	0.007
Fe^{3+}	0.002	0.025	0.000	0.000	0.000	0.002	0.002
Fe^{2+}	0.108	0.088	0.184	0.107	0.107	0.192	0.192
Cr	0.015	0.013	0.006	0.021	0.021	0.008	0.008
Mg	0.958	0.952	0.957	0.954	0.954	0.919	0.919
Ca	0.882	0.894	0.790	0.871	0.871	0.813	0.813
Na	0.007	0.008	0.009	0.009	0.009	0.012	0.012
Sum	3.998	4.000	4.000	3.999	3.999	4.000	4.000
WO	45.2	45.6	40.9	45.1	45.1	42.2	42.2
EN	49.1	48.6	49.6	49.4	49.4	47.7	47.7
FS	5.7	5.8	9.5	5.5	5.5	10.1	10.1

Data obtained by G.D. Harper

Table C3a: Microprobe analysis of plagioclase in O/C-118

Hornblende quartz diorite, Half Moon Bar diorite (see table A7)

Plagioclase coexisting with hornblende, table 3.1a (chapter 3)

Analysis	69	71	82	74	86	63	83
Location	1	2	5	3	4	5	5
SiO_2	58.92	59.28	59.29	63.07	66.38	67.76	59.21
TiO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al_2O_3	25.77	25.68	25.80	22.60	21.16	20.22	25.82
FeO*	0.11	0.24	0.18	0.20	0.02	0.24	0.12
MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MgO	0.09	0.01	0.00	0.01	0.00	0.05	0.02
CaO	7.43	7.39	7.44	3.60	2.02	1.59	7.49
Na_2O	7.40	7.43	7.29	9.19	10.64	10.74	7.32
K_2O	0.14	0.13	0.15	0.03	0.00	0.00	0.10
Total	99.85	100.17	100.16	98.71	100.21	100.60	100.09
Si	10.542	10.575	10.570	11.270	11.628	11.805	10.562
Al	5.431	5.395	5.417	4.757	4.366	4.149	5.424
Ti	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fe^{2+}	0.017	0.036	0.027	0.030	0.003	0.035	0.017
Mn	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mg	0.023	0.003	0.000	0.004	0.000	0.013	0.006
Ba	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ca	1.424	1.411	1.422	0.688	0.378	0.298	1.431
Na	2.566	2.570	2.521	3.185	3.613	3.628	2.531
K	0.032	0.029	0.034	0.007	0.000	0.000	0.023
Sum	20.035	20.019	19.991	19.941	19.988	19.928	19.994
Ab	63.80	64.10	63.40	82.10	90.50	92.40	63.50
An	35.40	35.20	35.80	17.70	9.50	7.60	35.90
Or	0.80	0.70	0.90	0.20	0.00	0.00	0.60
coexisting hbl analys.	68	70	78	80	76	79	81

Analysis was performed at Rensselaer Polytechnique Institute using a JEOL 733X electron microprobe operating at 15 keV accelerating voltage and 15.5 nA sample current. Analyses were obtained using a defocused beam site and integrated count times of 5 seconds.

Total iron as FeO*

End members were determined after cation normalization per 32 oxygens.

Table C3b: Microprobe analysis of plagioclase in O/C-376

Hornblende quartz diorite, Half Moon Bar diorite (see table A7)

Plagioclase coexisting with hornblende, table 3.1b (chapter 3)								Plagioclase core
Analysis	46	47	60	59	56	57	67	44
Location	2	2	1	1	3	3	5	2
SiO_2	60.03	57.48	54.58	61.38	54.84	66.21	64.67	49.66
TiO_2	0.00	0.03	0.06	0.00	0.01	0.04	0.07	0.02
Al_2O_3	25.35	27.88	28.68	24.12	28.56	21.27	22.33	31.77
FeO*	0.16	0.27	0.48	0.22	0.35	0.22	0.21	0.55
MnO	0.00	0.06	0.00	0.04	0.00	0.01	0.02	0.00
MgO	0.03	0.05	0.02	0.01	0.02	0.03	0.00	0.02
CaO	6.67	8.52	11.60	5.75	10.76	2.50	3.41	14.84
Na_2O	7.57	5.92	5.14	8.01	5.38	10.15	9.56	3.20
K_2O	0.27	0.61	0.15	0.35	0.17	0.12	0.25	0.08
Total	100.07	100.82	100.71	99.87	100.10	100.56	100.52	100.13
Si	10.689	10.223	9.818	10.925	9.894	11.583	11.358	9.077
Al	5.315	5.840	6.075	5.056	6.068	4.382	4.618	6.840
Ti	0.000	0.004	0.008	0.000	0.001	0.005	0.010	0.003
Fe^{2+}	0.024	0.040	0.072	0.032	0.053	0.033	0.031	0.083
Mn	0.000	0.009	0.000	0.006	0.000	0.002	0.003	0.000
Mg	0.007	0.014	0.004	0.002	0.006	0.007	0.000	0.006
Ba	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ca	1.273	1.623	2.236	1.096	2.079	0.468	0.641	2.906
Na	2.613	2.042	1.794	2.764	1.882	3.443	3.257	1.132
K	0.060	0.138	0.034	0.080	0.040	0.028	0.055	0.019
Sum	19.981	19.933	20.041	19.961	20.023	19.951	19.973	20.066
Ab	66.2	53.7	44.1	70.2	47.0	87.4	82.4	27.9
An	32.3	42.7	55.0	27.8	52.0	11.9	16.2	71.6
Or	1.5	3.6	0.8	2.0	1.0	0.7	1.4	0.5
coexisting hbl analys.	40	41	48	49	53	55	64	-

Analysis was performed at Rensselaer Polytechnique Institute using a JEOL 733X electron microprobe operating at 15 keV accelerating voltage and 15.5 nA sample current. Analyses were obtained using a defocused beam site and integrated count times of 5 seconds.

Total iron as FeO*

End members were determined after cation normalization per 32 oxygens.

Table C4: Microprobe analysis of plagioclase in O/C-229

Hornblende quartz diorite in metagabbro unit (see table A1b for petrography)

Plagioclase coexisting with hornblende, table 3.2 (chapter 3)

Analysis	129	131	130	121	127	126	133
Location	2	4	5	5	5	5	5
SiO2	61.66	58.15	56.65	57.18	56.13	55.61	54.41
TiO2	0	0	0	0.03	0.18	0	0.01
Al2O3	24.59	26.7	27.78	27.29	27.61	28.52	29.13
FeO	0.45	0.58	0.37	0.17	0.09	0.31	0.23
MnO	0.01	0.01	0.01	0.01	0.02	0	0.01
MgO	0.16	0.2	0.09	0	0	0.01	0.01
CaO	4.16	7.38	8.89	9.23	9.74	10.08	11.43
Na2O	7.93	6.52	6.01	6.6	6.17	5.86	5.34
K2O	1.03	0.78	0.54	0.07	0.11	0.33	0.06
Total	99.99	100.31	100.33	100.57	100.03	100.72	100.62
Si	10.948	10.394	10.152	10.214	10.095	9.963	9.78
Al	5.141	5.621	5.862	5.742	5.848	6.017	6.166
Ti	0	0	0	0.004	0.024	0	0.002
Fe2	0.067	0.086	0.056	0.025	0.014	0.046	0.034
Mn	0.002	0.001	0.001	0.002	0.003	0	0.001
Mg	0.043	0.052	0.025	0.001	0	0.003	0.004
Ba	0	0	0	0	0	0	0
Ca	0.792	1.414	1.708	1.766	1.877	1.934	2.201
Na	2.73	2.26	2.087	2.287	2.151	2.036	1.862
K	0.234	0.177	0.123	0.015	0.024	0.076	0.013
Sum	19.957	20.005	20.014	20.056	20.036	20.075	20.063
Ab	72.7	58.7	53.3	56.2	53.1	50.3	45.7
An	21.1	36.7	43.6	43.4	46.3	47.8	54
Or	0.8	0.7	0.9	0.2	0	0	0.6
Coexisting hbl analys.	139	138	125	134	135	136	137

Analysis was performed at Rensselaer Polytechnique Institute using a JEOL 733X electron microprobe operating at 15 keV accelerating voltage and 15.5 nA sample current. Analyses were obtained using a defocused beam site and integrated count times of 5 seconds.

Total iron as FeO*

End members were determined after cation normalization per 32 oxygens.

Table C5a: Microprobe analysis of plagioclase in MRH-78/1

Metagabbro unit (see table A1a for petrography)

Plagioclase coexisting with hornblende, table 3.3 (chapter 3)

Analysis	142	144	149	152	160
Location	1	1	2	3	4
SiO2	65.382	62.548	64.828	63.431	61.518
TiO2	0.034	0.015	0.015	0.017	0.000
Al2O3	22.063	23.865	22.707	23.456	24.823
FeO	0.124	0.085	0.080	0.090	0.047
MnO	0.006	0.026	0.003	0.006	0.010
MgO	0.008	0.008	0.014	0.005	0.011
CaO	2.447	4.882	3.042	4.317	5.941
Na2O	10.137	8.849	9.829	9.191	8.418
K2O	0.049	0.058	0.070	0.033	0.026
Total	100.250	100.340	100.590	100.550	100.790
Si	11.469	11.042	11.351	11.152	10.844
Al	4.558	4.961	4.682	4.857	5.153
Ti	0.004	0.002	0.002	0.002	0
Fe2	0.018	0.013	0.012	0.013	0.007
Mn	0.001	0.004	0	0.001	0.001
Mg	0.002	0.002	0.004	0.001	0.003
Ba	0	0	0	0	0
Ca	0.46	0.923	0.571	0.813	1.122
Na	3.448	3.029	3.337	3.133	2.877
K	0.011	0.013	0.016	0.007	0.006
Sum	19.971	19.989	19.975	19.979	20.013
Ab	88.00	76.40	85.00	79.30	71.80
An	11.7	23.3	14.6	20.6	28
Or	0.3	0.3	0.4	0.2	0.1
Coexisting hbl analys.	141	143,145	150	151	156,165

Analysis was performed at Rensselaer Polytechnique Institute using a JEOL 733X electron microprobe operating at 15 keV accelerating voltage and 15.5 nA sample current. Analyses were obtained using a defocused beam site and integrated count times of 5 seconds.

Total iron as FeO*

End members were determined after cation normalization per 32 oxygens.

Table C5b: Microprobe analysis of plagioclase in MRH-78/2

Metagabbro unit (see table A1a for petrography)

Plagioclase coexisting with hornblende, table 3.3 (chapter 3)

Analysis	42	47	50	55	40
Location	2	1	4	4	3
SiO2	65.244	63.962	62.810	63.995	66.075
TiO2	0.029	0.018	0.017	0.019	0.058
Al2O3	22.224	22.651	23.633	22.988	21.259
FeO	0.113	0.048	0.087	0.094	0.179
MnO	0.005	0.005	0.006	0.009	0.010
MgO	0.009	0.007	0.004	0.012	0.000
CaO	2.596	3.666	4.781	3.693	1.702
Na2O	10.060	9.535	8.971	9.499	10.522
K2O	0.055	0.041	0.028	0.061	0.024
Total	100.340	99.930	100.340	100.37	99.830
Si	11.439	11.292	11.083	11.253	11.616
Al	4.589	4.709	4.911	4.761	4.401
Ti	0.004	0.002	0.002	0.003	0.008
Fe2	0.017	0.007	0.013	0.014	0.026
Mn	0.001	0.001	0.001	0.001	0.001
Mg	0.002	0.002	0.001	0.003	0
Ba	0	0	0	0	0
Ca	0.488	0.693	0.904	0.696	0.321
Na	3.42	3.264	3.069	3.239	3.587
K	0.012	0.009	0.006	0.014	0.005
Sum	19.972	19.979	19.99	19.984	19.965
Ab	87.2	82.3	77.1	82	91.7
An	12.4	17.5	22.7	17.6	8.2
Or	0.3	0.2	0.2	0.4	0.1
Coexisting hbl analys.	41,43	49	51	52	54

Analysis was performed at Rensselaer Polytechnique Institute using a JEOL 733X electron microprobe operating at 15 keV accelerating voltage and 15.5 nA sample current. Analyses were obtained using a defocused beam site and integrated count times of 5 seconds.

Total iron as FeO*

End members were determined after cation normalization per 32 oxygens.

Table C5c: Microprobe analysis of plagioclase in O/C-373

Metagabbro unit (see table A1a for petrography)

Plagioclase coexisting with hornblende, table 3.3 (chapter 3)

Analysis	8	12	17	20	24	30
Location	1	4	4	3	3	3
SiO2	63.424	61.447	63.222	61.510	64.412	62.790
TiO2	0.020	0.044	0.020	0.000	0.000	0.049
Al2O3	23.423	24.404	23.488	24.795	23.189	23.692
FeO	0.133	0.169	0.076	0.259	0.047	0.060
MnO	0.011	0.027	0.007	0.000	0.000	0.009
MgO	0.018	0.004	0.010	0.060	0.018	0.010
CaO	4.009	5.482	4.372	5.162	3.489	4.792
Na2O	9.235	8.417	9.164	8.347	9.598	8.995
K2O	0.097	0.056	0.048	0.277	0.085	0.029
Total	100.370	100.050	100.410	100.410	100.840	100.430
Si	11.167	10.903	11.135	10.877	11.264	11.071
Al	4.857	5.099	4.872	5.163	4.776	4.919
Ti	0.003	0.006	0.003	0	0	0.006
Fe2	0.02	0.025	0.011	0.038	0.007	0.009
Mn	0.002	0.004	0.001	0	0	0.001
Mg	0.005	0.001	0.003	0.016	0.005	0.003
Ba	0	0	0	0	0	0
Ca	0.756	1.042	0.825	0.978	0.654	0.905
Na	3.153	2.896	3.13	2.862	3.254	3.075
K	0.022	0.013	0.011	0.062	0.019	0.007
Sum	19.985	19.989	19.991	19.996	19.979	19.996
Ab	80.2	73.3	78.9	73.3	82.9	77.1
An	19.2	26.4	20.8	25.1	16.7	22.7
Or	0.6	0.3	0.3	1.6	0.5	0.2
Coexisting hbl analys.	6	13, 14	15	23	25, 26	27, 29

Analysis was performed at Rensselaer Polytechnique Institute using a JEOL 733X electron microprobe operating at 15 keV accelerating voltage and 15.5 nA sample current. Analyses were obtained using a defocused beam site and integrated count times of 5 seconds.

Total iron as FeO*

End members were determined after cation normalization per 32 oxygens.

Table C6a: Cr-spinel compositions in sample O/C-4-S3a (sheeted dike complex)

analysis	23[1]	24[1]	25[1]	26[1]	27[1]	27[1]
Location	1	1	2	2	3	3
TiO2	0.26	0.26	0.41	0.40	0.26	0.26
Al2O3	10.30	10.47	10.00	9.88	10.67	10.64
Fe2O3	3.99	3.79	4.83	4.83	3.81	3.98
FeO	13.02	13.37	17.01	16.69	14.00	17.49
MgO	14.03	14.04	12.07	12.22	14.03	11.63
Cr2O3	55.60	56.35	54.74	54.74	56.93	55.45
Ti	0.0064	0.0064	0.0102	0.0100	0.0063	0.0064
Al	0.3993	0.4017	0.3872	0.3835	0.4041	0.4103
Fe3	0.1398	0.1325	0.1703	0.1704	0.1318	0.1424
Fe2	0.3172	0.3244	0.4164	0.4089	0.3367	0.4345
Mg	0.6878	0.6817	0.5912	0.5996	0.6720	0.5673
Cr	1.4459	1.4507	1.4217	1.4250	1.4468	1.4350
Cr #	78.4	78.3	78.6	78.8	78.2	77.8
Mg #	68.4	67.8	58.7	59.5	66.6	56.6

analysis	29[P]	30[P]	31[P]	32[P]	33[P]	34[P]
Location	1	1	2	2	3	3
TiO2	0.23	0.22	0.24	0.24	0.31	0.29
Al2O3	10.45	10.41	10.35	10.39	10.97	10.58
Fe2O3	3.22	3.17	3.45	3.54	3.84	4.06
FeO	11.63	11.76	18.26	18.41	21.50	23.60
MgO	15.20	15.09	10.89	10.78	9.13	7.48
Cr2O3	57.97	58.06	55.09	54.87	53.23	52.56
Ti	0.0057	0.0053	0.0061	0.0059	0.0077	0.0073
Al	0.3964	0.3951	0.4062	0.4082	0.4319	0.4235
Fe3	0.1114	0.1102	0.1273	0.1303	0.1427	0.1536
Fe2	0.2795	0.2836	0.4676	0.4713	0.5545	0.6204
Mg	0.7291	0.7245	0.5405	0.5354	0.4546	0.3788
Cr	1.4750	1.4786	1.4503	1.4452	1.4057	1.4112
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Cr #	78.8	78.9	78.1	78.0	76.5	76.9
Mg #	72.3	71.9	53.6	53.2	45.0	37.9

[1] inclusion in olivine pseudomorph
[P] microphenocryst

Data obtained by G.D. Harper

Table C6a: Cr-spinel compositions in sample O/C-4-S3 (sheeted dike complex)

analysis	35[1]	36[1]	37[1]	38[1]	39[1]	40[1]
Location	1	1	2	2	3	3
TiO2	0.35	0.32	0.52	0.59	0.24	0.25
Al2O3	12.06	11.92	9.94	10.34	11.21	11.17
Fe2O3	3.96	3.63	6.91	7.27	3.74	3.64
FeO	12.53	14.68	20.66	20.92	10.84	10.86
MgO	14.99	13.68	10.45	10.33	15.96	15.94
Cr2O3	55.46	55.58	51.56	50.27	57.93	57.72
Ti	0.0083	0.0077	0.0128	0.0147	0.0056	0.0060
Al	0.4524	0.4496	0.3862	0.4025	0.4172	0.4172
Fe3	0.1339	0.1263	0.2411	0.2532	0.1245	0.1219
Fe2	0.2943	0.3541	0.5004	0.5057	0.2507	0.2526
Mg	0.7110	0.6524	0.5138	0.5085	0.7513	0.7529
Cr	1.3953	1.4062	1.3442	1.3131	1.4466	1.4463
Cr #	75.5	75.8	77.7	76.5	77.6	77.6
Mg #	70.7	64.8	50.7	50.1	75.0	74.9

[1]…inclusion in olivine pseudomorph

Data obtained by G.D. Harper

Table C6b Cr-spinel compositions in sample MRH-45a (sheeted dike complex)

analysis	1[1]	2[1]	3[1]	4[1]	5[1]
Location	1	2	3	4	5
TiO2	0.29	0.26	0.22	0.31	0.32
Al2O3	10.65	9.78	9.79	9.59	9.50
Fe2O3	3.81	3.11	3.03	3.68	3.36
FeO	17.56	32.49	33.98	28.97	26.09
MgO	11.49	1.49	0.31	4.06	5.70
Cr2O3	55.47	50.86	50.47	52.37	53.60
Ti	0.0071	0.0070	0.0059	0.0082	0.0083
Al	0.4120	0.4131	0.4176	0.3938	0.3871
Fe3	0.1372	0.1282	0.1264	0.1456	0.1316
Fe2	0.4387	0.9292	0.9844	0.7956	0.7099
Mg	0.5618	0.0797	0.0169	0.2110	0.2938
Cr	1.4389	1.4409	1.4438	1.4433	1.4648
Cr #	77.7	77.7	77.6	78.6	79.1
Mg #	56.2	7.9	1.7	21.0	29.3

analysis	6[1]	7[1]	8[1]	9[P]	10[P]
location	5	5	6	1	1
TiO2	0.16	0.17	0.30	0.42	0.44
Al2O3	9.48	9.65	8.38	10.81	10.97
Fe2O3	3.15	3.08	3.42	7.11	7.06
FeO	11.39	11.29	33.36	22.91	22.84
MgO	15.13	15.18	0.69	8.74	9.04
Cr2O3	59.15	59.07	51.71	48.33	49.04
Ti	0.0040	0.0041	0.0083	0.0106	0.0109
Al	0.3618	0.3683	0.3587	0.4300	0.4309
Fe3	0.1098	0.1074	0.1422	0.2557	0.2506
Fe2	0.2756	0.2734	0.9639	0.5718	0.5635
Mg	0.7305	0.7325	0.0376	0.4397	0.4493
Cr	1.5152	1.5116	1.4841	1.2900	1.2929
Cr #	80.7	80.4	80.5	75.0	75.0
Mg #	72.6	72.8	3.8	43.5	44.4

[1]…inclusion in olivine pseudomorph
[P]… microphenocryst

Data obtained by G.D. Harper

Table C6c: Cr-spinel compositions in sample O/C-325 (sheeted dike complex)

analysis	1[P]	2[P]	3[P]	4[P]	5[I]	6[I]	7[I]	8[I]
location	1	1	2	2	1	2	3	4
TiO2	0.27	0.28	0.22	0.21	0.21	0.22	0.19	0.30
Al2O3	10.60	10.83	10.32	10.31	10.74	10.69	10.36	9.65
Fe2O3	4.13	4.07	3.68	3.71	3.66	3.63	3.95	4.91
FeO	11.29	11.41	11.57	11.55	11.66	12.77	12.16	17.21
MgO	15.46	15.52	15.31	15.48	14.99	14.48	15.03	11.70
Cr2O3	56.64	56.70	57.93	58.59	56.48	56.77	57.58	54.45
Ti	0.0066	0.0068	0.0052	0.0050	0.0052	0.0053	0.0047	0.0074
Al	0.4023	0.4090	0.3902	0.3870	0.4107	0.4075	0.3916	0.3779
Fe3	0.1394	0.1370	0.1255	0.1254	0.1264	0.1261	0.1343	0.1751
Fe2	0.2647	0.2668	0.2738	0.2709	0.2797	0.3078	0.2873	0.4259
Mg	0.7421	0.7415	0.7324	0.7346	0.7251	0.6982	0.7187	0.5798
Cr	1.4422	1.4366	1.4696	1.4745	1.4495	1.4523	1.4606	1.4305
Cr #	78.2	77.8	79.0	79.2	77.9	78.1	78.9	79.1
Mg #	73.7	73.5	72.8	73.1	72.2	69.4	71.4	57.6

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analysis	9[I]	10[C]	16[C]	18[P]	19[P]	20[I]	21[I]
location	4	5	6	3	3	7	7
TiO2	0.33	0.62	0.33	0.22	0.20	0.31	0.28
Al2O3	9.73	12.93	9.21	10.71	10.69	10.44	10.37
Fe2O3	4.85	5.53	3.69	3.60	3.75	4.15	4.59
FeO	17.53	19.89	28.70	10.97	10.42	12.93	13.46
MgO	11.76	10.32	2.63	15.82	15.92	14.40	13.82
Cr2O3	55.10	48.05	48.23	58.17	58.21	56.38	55.99
Ti	0.0080	0.0156	0.0092	0.0053	0.0047	0.0075	0.0067
Al	0.3772	0.5079	0.4062	0.4013	0.4011	0.3984	0.3975
Fe3	0.1717	0.1982	0.1564	0.1212	0.1254	0.1427	0.1575
Fe2	0.4307	0.4948	0.8452	0.2565	0.2420	0.3088	0.3209
Mg	0.5767	0.5123	0.1469	0.7499	0.7554	0.6953	0.6701
Cr	1.4329	1.2658	1.4262	1.4626	1.4652	1.4437	1.4397
Cr #	79.2	71.4	77.8	78.5	78.5	78.4	78.4
Mg #	57.2	50.9	14.8	74.5	75.7	69.2	67.6

[I] inclusion in olivine pseudomorph
[P] microphenocryst
C inclusion in clinopyroxene

Data obtained by G.D. Harper

Table C7: Cr-spinel compositions in sample O/C-224b (pillow unit)

analysis	1[C]	2[C]	3[C]	4[C]	5[C]	6[C]
location	1	1	2	2	3	3
TiO2	0.25	0.24	0.25	0.24	0.23	0.24
Al2O3	11.45	10.86	11.20	11.25	11.02	11.42
Fe2O3	3.61	3.30	3.52	3.72	3.26	3.58
FeO	15.43	24.25	14.80	14.91	15.42	16.30
MgO	13.13	7.18	12.88	12.89	12.74	12.06
Cr2O3	55.80	52.97	55.35	54.92	55.77	54.59
Ti	0.0061	0.0060	0.0061	0.0058	0.0056	0.0059
Al	0.4352	0.4344	0.4327	0.4347	0.4253	0.4425
Fe3	0.1271	0.1266	0.1255	0.1322	0.1173	0.1290
Fe2	0.3767	0.6459	0.3668	0.3684	0.3852	0.4076
Mg	0.6309	0.3632	0.6292	0.6302	0.6217	0.5912
Cr	1.4227	1.4209	1.4339	1.4235	1.4436	1.4189
Cr #	76.6	76.6	76.8	76.6	77.2	76.2
Mg #	62.6	36.0	63.2	63.1	61.7	59.2

analysis	7[C]	8[C]	9[P]	10[P]	11[P]	12[P]
location	4	4	1	1	1	1
TiO2	0.23	0.25	0.23	0.23	0.21	0.24
Al2O3	11.21	11.16	9.04	8.84	8.82	8.49
Fe2O3	3.21	3.29	3.63	3.31	3.69	2.97
FeO	15.56	15.36	15.34	15.21	15.10	20.67
MgO	12.50	12.52	12.68	12.54	12.64	9.09
Cr2O3	54.93	55.14	58.21	58.18	58.34	57.11
Ti	0.0057	0.0062	0.0057	0.0058	0.0051	0.0060
Al	0.4359	0.4334	0.3494	0.3448	0.3422	0.3394
Fe3	0.1165	0.1192	0.1299	0.1202	0.1319	0.1134
Fe2	0.3923	0.3858	0.3808	0.3834	0.3751	0.5485
Mg	0.6147	0.6150	0.6203	0.6191	0.6202	0.4594
Cr	1.4327	1.4365	1.5099	1.5228	1.5183	1.5312
Cr #	76.7	76.8	81.2	81.5	81.6	81.9
Mg #	61.0	61.5	62.0	61.8	62.3	45.6

[C] inclusion in cpx(?) pseudomorph

[P].... microphenocryst

Data obtained by G.D. Harper

Table C8: Cr-spinel compositions in sample O/C-81b (Mule Mountain volcanics)

analysis	1^P	2^P	7^C	8^C	9^C
location	1	1	1	1	2
TiO2	0.23	0.21	0.38	0.38	0.31
Al2O3	10.48	10.40	11.11	10.94	9.25
Fe2O3	3.41	3.34	5.22	5.30	5.08
FeO	21.70	22.36	18.22	18.23	20.50
MgO	8.60	8.11	11.22	11.13	9.83
Cr2O3	54.04	53.79	52.28	52.43	54.04
Ti	0.0058	0.0055	0.0094	0.0094	0.0079
Al	0.4168	0.4164	0.4327	0.4267	0.3655
Fe3	0.1291	0.1274	0.1852	0.1877	0.1849
Fe2	0.5701	0.5928	0.4484	0.4488	0.5180
Mg	0.4325	0.4105	0.5528	0.5493	0.4909
Cr	1.4418	1.4443	1.3664	1.3720	1.4320
Cr #	77.6	77.6	75.9	76.3	79.7
Mg #	43.1	40.9	55.2	55.0	48.7

analysis	10^C	13^P	16^P	19^C
location	2	2	3	3
TiO2	0.25	0.49	0.50	0.30
Al2O3	7.94	14.98	18.12	10.89
Fe2O3	4.64	9.75	8.76	7.43
FeO	20.13	21.13	20.87	18.95
MgO	9.71	10.64	10.68	9.82
Cr2O3	56.33	41.73	38.42	49.38
Ti	0.0062	0.0120	0.0121	0.0075
Al	0.3155	0.5755	0.6947	0.4338
Fe3	0.1708	0.3254	0.2948	0.2615
Fe2	0.5149	0.4900	0.4874	0.4633
Mg	0.4881	0.5170	0.5178	0.4947
Cr	1.5024	1.0757	0.9878	1.3195
Cr #	82.6	65.1	58.7	75.3
Mg #	48.7	51.3	51.5	51.6

^{C} inclusion in cpx
^{P} microphenocrysts