Appendix 1. Table DR1. Selected plagioclase analyses and formulas* from volcanic samples.

Sample	72B-plag1	40-Cplag1	40-Cplag2	40-Cplag3	40-Cplag4	40-Cplag5	72Aplag1	72Aplag2	72Aplag3	72Aplag4	72Aplag5
Unit	PBv	JPv	JPv	JPv	JPv	JPv	PBv	PBv	PBv	PBv	PBv
SiO2	65.32	68.71	67.02	66.32	67.02	65.77	66.96	65.52	66.34	65.14	65.45
TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.03	0.03
Al2O3	21.03	19.64	20.87	20.56	20.67	20.55	19.74	19.81	19.67	19.34	19.52
FeO	0.69	0.06	0.11	0.24	0.22	0.78	0.03	0.60	0.07	0.86	0.02
MgO	0.65	0.00	0.00	0.17	0.00	0.58	0.13	0.49	0.13	0.75	0.11
CaO	1.06	0.24	1.68	2.16	1.55	1.23	0.29	1.44	0.54	0.79	0.32
Na2O	9.51	11.32	10.38	10.59	10.58	10.44	11.24	10.90	11.23	11.02	11.44
K2O	1.37	0.00	0.01	0.00	0.01	0.08	0.06	0.07	0.06	0.06	0.05
Total	99.63	99.98	100.07	100.04	100.04	99.43	98.52	98.89	98.05	98.02	96.94
Formula Units											
Si	2.90	3.00	2.93	2.91	2.93	2.91	2.97	2.92	2.96	2.93	2.96
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.10	1.01	1.08	1.06	1.07	1.07	1.03	1.04	1.03	1.03	1.04
Fe	0.03	0.00	0.00	0.01	0.01	0.03	0.00	0.02	0.00	0.03	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.03	0.00	0.00	0.01	0.00	0.03	0.01	0.02	0.01	0.04	0.01
Na	0.82	0.96	0.88	0.90	0.90	0.90	0.97	0.94	0.97	0.96	1.00
K	0.03	0.00	0.00	0.01	0.00	0.02	0.01	0.02	0.01	0.03	0.01

Note: PBv = Penon Blanco basalts; JPv = Jasper Point basalts

*Formula units calculated on basis of 8 oxygen

Appendix 1. Table DR2. Selected clinopyroxene analyses and formulas* from Penon Blanco basalts.

Sample	57D-cpx1	57D-cpx2	57D-cpx3	57D-cpx4	57D-cpx5	72B-cpx1	72B-cpx2	72B-cpx3	72B-cpx4	72B-cpx5	56A-cpx1	56A-cpx2
SiO2	52.71	51.76	52.03	51.08	52.00	51.33	53.13	51.91	51.63	52.42	51.19	53.06
TiO2	0.11	0.17	0.17	0.21	0.25	0.13	0.01	0.14	0.14	0.03	0.19	0.04
Al2O3	3.14	2.62	3.55	1.95	2.93	2.15	1.69	1.91	2.02	1.92	1.84	1.75
FeO*	5.43	9.09	6.63	8.72	9.05	7.66	4.35	10.22	10.57	5.86	9.68	4.29
MnO	0.08	0.19	0.11	0.18	0.18	0.16	0.08	0.18	0.20	0.07	0.23	0.06
MgO	15.89	15.36	14.91	15.17	14.43	15.71	17.44	15.40	15.18	16.31	14.85	16.99
CaO	21.97	19.70	21.59	20.31	20.93	20.82	22.50	18.78	18.92	21.48	19.61	21.88
Cr2O3	0.11	0.01	0.03	0.00	0.00	0.01	0.16	0.00	0.00	0.43	0.00	0.30
Na2O	0.10	0.17	0.15	0.21	0.20	0.14	0.09	0.15	0.17	0.24	0.19	0.11
K2O	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	99.55	99.07	99.17	97.83	99.97	98.12	99.44	98.71	98.84	98.77	97.77	98.47
Formula Units												
Si	1.94	1.94	1.93	1.94	1.93	1.94	1.95	1.95	1.95	1.95	1.95	1.96
Ti	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Al	0.07	0.06	0.08	0.04	0.06	0.05	0.04	0.04	0.04	0.04	0.04	0.04
Fe	0.17	0.28	0.21	0.28	0.28	0.24	0.13	0.32	0.33	0.18	0.31	0.13
Mn	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.00
Mg	0.87	0.86	0.82	0.86	0.80	0.88	0.95	0.86	0.85	0.90	0.84	0.94
Ca	0.87	0.79	0.86	0.83	0.83	0.84	0.89	0.76	0.76	0.86	0.80	0.87
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Na	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* Formulas calculated on basis of 6 oxygen.

Appendix 1. Table DR2. (continued)

Sample	56A-cpx3	56A-cpx4	56A-cpx5	35B-cpx1	35B-cpx2	35B-cpx3	35B-cpx4	35B-cpx5	72A-cpx1	72A-cpx2	72A-cpx4	72A-cpx5
SiO2	51.43	50.80	51.42	52.33	54.05	51.05	51.95	50.40	51.45	51.78	51.49	51.10
TiO2	0.23	0.22	0.19	0.16	0.01	0.22	0.20	0.14	0.22	0.22	0.21	0.23
Al2O3	1.89	1.99	2.12	2.20	0.38	1.69	1.68	1.73	2.26	2.09	2.01	2.11
FeO*	8.47	9.51	9.27	8.60	6.40	8.47	8.46	8.41	10.10	10.11	9.48	10.30
MnO	0.18	0.21	0.23	0.18	0.22	0.17	0.18	0.12	0.27	0.24	0.26	0.27
MgO	14.92	15.29	15.33	15.24	15.04	15.05	15.10	14.98	15.94	15.68	15.58	15.80
CaO	20.16	19.61	19.33	20.41	23.70	21.03	21.19	21.11	18.43	19.06	19.35	18.58
Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.06	0.05
Na2O	0.19	0.17	0.16	0.18	0.08	0.22	0.21	0.21	0.30	0.30	0.30	0.31
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Total	97.47	97.80	98.04	99.30	99.88	97.92	98.97	97.10	99.04	99.56	98.76	98.73
Formula Units												
Si	1.96	1.93	1.95	1.95	2.00	1.94	1.95	1.93	1.93	1.94	1.94	1.93
Ti	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Al	0.04	0.04	0.05	0.05	0.01	0.04	0.04	0.04	0.05	0.05	0.04	0.05
Fe	0.27	0.30	0.29	0.27	0.20	0.27	0.27	0.27	0.32	0.32	0.30	0.33
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Mg	0.85	0.87	0.86	0.85	0.83	0.85	0.84	0.86	0.89	0.87	0.87	0.89
Ca	0.82	0.80	0.78	0.82	0.94	0.86	0.85	0.87	0.74	0.76	0.78	0.75
Cr	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	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* Formulas calculated on basis of 6 oxygen.

Appendix 1. Table DR2. (continued)

Sample	57Acpx1	57Acpx2	57Acpx3	57Acpx4	57Acpx5
SiO2	50.24	50.02	50.36	50.87	52.90
TiO2	0.28	0.19	0.25	0.19	0.18
Al2O3	1.97	2.42	3.52	2.42	2.39
FeO*	10.07	6.19	6.03	6.73	5.62
MnO	0.29	0.18	0.15	0.20	0.16
MgO	14.63	15.80	16.11	15.93	16.64
CaO	19.91	22.30	21.76	21.39	21.58
Cr2O3	0.02	0.22	0.34	0.33	0.28
Na2O	0.34	0.32	0.25	0.31	0.28
K2O	0.00	0.00	0.00	0.00	0.00
Total	97.74	97.65	98.77	98.38	100.04
Formula Units					
Si	1.93	1.90	1.88	1.91	1.94
Ti	0.01	0.01	0.01	0.01	0.01
Al	0.04	0.05	0.08	0.05	0.05
Fe	0.32	0.20	0.19	0.21	0.17
Mn	0.01	0.01	0.00	0.01	0.00
Mg	0.84	0.89	0.90	0.89	0.91
Ca	0.82	0.91	0.87	0.86	0.85
Cr	0.00	0.00	0.01	0.00	0.00
Na	0.01	0.01	0.01	0.01	0.01
K	0.00	0.00	0.00	0.00	0.00

* Formulas calculated on basis of 6 oxygen.

Appendix 1. Table DR3. Whole-rock composition of volcanic rocks from Jasper Point Formation.

Sample	**PB-76A**	**PB-67E**	**PB-67A**	**PB-46A**	**PB-45C**	**PB-40C**	**PB-134A**	**PB-145C**	**PB-128A**
Group	**JPv**	**JPv**	**JPv**	**JPv**	**JPv**	**JPv**	**JPv**	**JPv**	**JPv**
SiO2, wt.%	49.51	50.31	50.66	48.60	52.77	50.14	51.72	49.81	57.10
TiO2	1.23	1.07	1.03	0.89	1.51	1.01	1.11	1.36	0.37
Al2O3	13.38	14.19	13.86	15.12	13.19	13.41	14.10	13.31	16.55
FeO*	14.18	10.80	10.40	9.78	12.82	12.11	10.63	13.93	7.48
MnO	0.20	0.19	0.19	0.19	0.28	0.20	0.20	0.21	0.14
MgO	7.09	7.09	7.35	8.99	6.71	8.10	7.62	6.78	4.36
CaO	7.94	9.71	10.11	11.92	8.45	10.00	9.36	10.20	9.91
Na2O	3.38	2.91	2.67	1.79	2.73	2.52	2.61	2.59	2.28
K2O	0.24	0.90	1.04	0.66	0.18	0.06	1.14	0.09	0.27
P2O5	0.12	0.09	0.07	0.07	0.11	0.07	0.08	0.05	0.09
sum	97.28	97.27	97.37	97.99	98.76	97.62	98.56	98.32	98.55
LOI	2.62	2.62	2.53	1.89	1.14	2.30	2.23	1.71	2.48
Total	99.90	99.90	99.90	99.88	99.89	99.91	100.79	100.03	101.04
Trace elements									
Ni, ppm	61	59	56	96	57	71	62	64	28
Cr	106	97	106	387	57	142	68	96	68
Sc	51.6	55.9	53.1	50.5	56.6	54.9	49.7	51.0	35.1
V	398	336	327	290	456	349	386	463	293
Ba	27	71	107	18	23	4	21	7	81
Rb	5.3	15.6	16.3	9.9	2.0	0.6	19.8	0.7	2.6
Sr	40	93	70	65	78	53	61	68	315
Zr	71	61	60	54	85	61	53	33	38
Y	36	28	28	23	41	29	31	26	13
Nb	0.74	0.49	0.44	0.68	1.20	0.63	0.70	0.47	0.65
Ga	13	16	17	15	16	15	16	17	14
Cu	83	92	63	88	60	28	343	118	166
Zn	95	89	88	75	109	53	91	72	66
Pb	0.35	0.32	0.20	0.36	0.51	0.31	0.14	0.16	3.05
Th	0.08	0.05	0.04	0.06	0.09	0.06	0.06	0.03	0.29
Ti	7392	6444	6179	5309	9024	6067	6661	8172	2229
K	1965	7429	8594	5479	1534	531	9449	711	2266
P	526	402	324	302	495	307	331	203	393
La	1.83	1.19	1.11	1.18	1.95	1.17	1.24	0.79	2.75
Ce	5.13	3.98	3.74	3.73	6.31	3.78	4.36	2.60	5.47
Pr	1.02	0.80	0.73	0.68	1.19	0.72	0.84	0.52	0.80
Nd	6.30	5.01	4.64	4.34	7.37	4.49	5.34	3.46	3.93
Sm	2.93	2.37	2.23	1.95	3.34	2.16	2.50	1.81	1.27
Eu	1.03	0.99	0.92	0.79	1.24	0.83	0.95	0.87	0.48
Gd	4.34	3.62	3.48	2.95	4.97	3.32	3.79	2.96	1.61
Tb	0.90	0.73	0.71	0.59	1.01	0.67	0.78	0.60	0.29
Dy	6.31	5.08	4.90	4.12	7.10	4.69	5.30	4.25	1.98
Ho	1.38	1.11	1.06	0.90	1.55	1.04	1.18	0.96	0.43
Er	3.92	3.12	2.99	2.59	4.46	2.99	3.34	2.71	1.22
Tm	0.58	0.45	0.45	0.38	0.65	0.44	0.49	0.40	0.19
Yb	3.64	2.88	2.80	2.40	4.14	2.81	3.17	2.56	1.19
Lu	0.58	0.46	0.45	0.38	0.65	0.44	0.50	0.40	0.20
Hf	1.83	1.53	1.49	1.24	2.30	1.42	1.62	1.02	0.96
Ta	0.06	0.04	0.04	0.05	0.09	0.05	0.06	0.04	0.04
U	0.23	0.12	0.04	0.10	0.04	0.01	0.04	0.01	0.16
Cs	0.28	0.41	0.57	0.36	0.16	0.05	0.53	0.04	0.07

Note: * Total Fe expressed as FeO
Note: JPv = Jasper Point volcanics.

Appendix 1. Table DR3. (continued)

Sample	PB-156A	PB-150A	PB-103A	156A +6%
Group	JPv	JPv	JPv	olivine
SiO2, wt.%	50.23	78.01	52.02	49.56
TiO2	0.71	0.31	1.10	0.67
Al2O3	15.48	8.36	14.24	14.55
FeO*	9.16	5.42	11.78	9.33
MnO	0.20	0.18	0.23	0.19
MgO	8.17	1.52	7.63	10.62
CaO	12.80	1.82	7.38	12.03
Na2O	2.20	2.60	4.54	2.06
K2O	0.35	0.51	0.42	0.33
P2O5	0.05	0.17	0.10	0.05
sum	99.35	98.91	99.44	99.39
LOI	1.05	1.52	2.12	N/A
Total	100.40	100.43	101.55	99.39
Trace elements				
Ni, ppm	121	28	62	181
Cr	348	32	147	334
Sc	47.9	15.3	50.9	45.5
V	276	86	369	260
Ba	62	354	65	58
Rb	3.9	9.5	5.5	3.6
Sr	72	100	62	67
Zr	31	54	51	30
Y	21	32	32	19
Nb	0.33	2.84	0.62	0.31
Ga	14	8	13	13
Cu	93	78	78	88
Zn	69	60	86	65
Pb	0.62	7.74	0.17	0.58
Th	0.03	2.27	0.05	0.03
Ti	4252	1870	6593	4002
K	2898	4255	3521	2724
P	214	750	430	201
La	0.69	23.12	1.14	0.65
Ce	2.38	18.92	3.70	2.24
Pr	0.46	5.04	0.76	0.43
Nd	2.98	22.05	5.10	2.80
Sm	1.48	5.46	2.44	1.39
Eu	0.63	1.48	0.96	0.60
Gd	2.26	5.87	3.77	2.12
Tb	0.47	0.96	0.75	0.45
Dy	3.35	5.87	5.25	3.14
Ho	0.74	1.20	1.17	0.69
Er	2.10	3.23	3.38	1.97
Tm	0.31	0.46	0.49	0.29
Yb	1.95	2.87	3.15	1.83
Lu	0.31	0.46	0.50	0.29
Hf	0.92	1.31	1.50	0.87
Ta	0.03	0.21	0.05	0.03
U	0.02	0.43	0.07	0.02
Cs	0.07	0.24	0.32	0.07

Note: * Total Fe expressed as FeO
Note: JPv = Jasper Point volcanics.

Appendix 1. Table DR4. Major and trace element composition of volcanic rocks from Penon Blanco Formation.

Sample	PB-74B	PB-74A	PB-73A	PB-72B	PB-72A	PB-69B	PB-60C	PB-57D	PB-56A	PB-52A
Group	PBv	PBv	PBv	PBv	PBv	PBv	PBv	PBv	PBv	PBv
SiO2, wt.%	52.36	52.40	50.33	49.52	55.52	56.11	60.15	53.69	48.52	52.28
TiO2	0.36	0.36	0.38	0.36	0.31	0.83	0.57	0.39	0.49	0.36
Al2O3	15.80	15.61	14.40	15.42	14.34	19.20	15.04	15.15	18.18	14.52
FeO*	8.08	8.19	9.66	8.84	7.31	4.47	6.89	8.00	9.44	8.57
MnO	0.16	0.16	0.18	0.17	0.14	0.06	0.16	0.15	0.16	0.16
MgO	7.61	8.32	9.43	8.34	6.29	2.79	4.21	6.44	7.51	9.41
CaO	7.84	6.97	8.12	10.00	9.19	6.22	6.15	10.00	7.86	8.62
Na2O	4.18	4.22	2.27	2.77	3.46	5.82	4.16	3.16	3.51	2.74
K2O	0.10	0.23	0.76	0.32	0.03	1.20	0.22	0.14	0.50	0.24
P2O5	0.06	0.06	0.06	0.09	0.08	0.84	0.15	0.06	0.08	0.05
sum	96.53	96.53	95.60	95.82	96.67	97.53	97.69	97.16	96.25	96.95
LOI	3.35	3.35	4.28	4.09	3.24	2.35	2.21	2.75	3.64	2.93
Total	99.88	99.88	99.88	99.90	99.91	99.89	99.90	99.91	99.89	99.88
Trace elements										
Ni, ppm	103	105	61	29	28	11	17	35	31	104
Cr	368	421	260	140	122	4	31	124	86	346
Sc	39.7	42.6	55.2	51.8	46.1	17.6	28.2	46.0	49.8	48.1
V	254	252	296	306	289	152	233	291	371	266
Ba	38	61	136	62	29	157	62	35	78	37
Rb	1.0	2.8	7.6	4.1	0.4	8.9	3.3	2.5	6.3	3.6
Sr	162	134	112	158	126	299	272	108	150	145
Zr	33	31	33	35	31	169	74	32	39	32
Y	12	13	14	15	14	50	18	13	16	14
Nb	0.39	0.38	0.36	0.78	0.61	6.18	2.31	0.46	0.65	0.29
Ga	12	11	11	12	13	15	15	14	13	12
Cu	92	69	124	63	125	59	133	83	108	57
Zn	75	75	77	67	53	85	65	69	84	67
Pb	2.85	1.65	1.44	1.72	1.88	1.29	1.64	2.61	1.70	1.72
Th	0.11	0.11	0.10	0.16	0.15	2.80	0.84	0.11	0.15	0.09
Ti	2133	2131	2302	2131	1836	5001	3429	2312	2931	2149
K	802	1946	6347	2655	257	9938	1867	1127	4174	1977
P	240	259	253	372	349	3647	642	246	363	207
La	1.25	1.47	1.20	2.13	2.07	29.78	7.54	1.30	1.50	1.17
Ce	2.85	3.23	2.57	4.21	3.90	56.32	15.87	2.84	3.55	2.68
Pr	0.48	0.53	0.44	0.64	0.58	7.40	2.20	0.46	0.61	0.47
Nd	2.62	2.98	2.46	3.35	3.08	33.30	10.29	2.56	3.48	2.77
Sm	1.00	1.11	1.06	1.23	1.12	8.18	2.80	1.08	1.40	1.11
Eu	0.42	0.46	0.39	0.45	0.39	2.13	0.89	0.41	0.47	0.47
Gd	1.46	1.50	1.55	1.73	1.54	8.16	2.79	1.48	1.88	1.62
Tb	0.28	0.30	0.31	0.33	0.31	1.32	0.48	0.29	0.37	0.30
Dy	1.96	2.03	2.14	2.30	2.08	8.02	2.95	2.02	2.52	1.98
Ho	0.42	0.44	0.47	0.51	0.47	1.72	0.64	0.45	0.56	0.44
Er	1.28	1.26	1.35	1.49	1.34	4.89	1.78	1.29	1.62	1.27
Tm	0.19	0.20	0.21	0.22	0.20	0.74	0.26	0.20	0.25	0.19
Yb	1.24	1.26	1.36	1.45	1.31	4.62	1.73	1.29	1.64	1.23
Lu	0.21	0.20	0.23	0.24	0.22	0.76	0.28	0.21	0.27	0.20
Hf	0.65	0.61	0.67	0.68	0.54	4.28	1.74	0.62	0.84	0.57
Ta	0.02	0.03	0.02	0.05	0.04	0.38	0.16	0.03	0.04	0.02
U	0.08	0.09	0.09	0.12	0.11	1.27	0.56	0.08	0.14	0.07
Cs	0.20	0.37	0.40	0.42	0.14	0.44	0.19	0.45	0.60	0.43

Note: * Total Fe expressed as FeO.
Note: PBv = Penon Blanco flows and flow breccias; PBvc = Penon Blanco volcaniclastic deposits.

Appendix 1. Table DR4. Continued

Sample	PB-51E	PB-06B	PB-71B	PB-68B	PB-57A	PB-47B	PB-34D	PB-09A	PB-39A	PB-49B
Group	PBv	PBv	PBvc	PBvc	PBvc	PBvc	PBvc	PBvc	PBvc	PBvc
SiO2, wt.%	54.31	51.42	51.74	55.04	51.52	55.92	56.17	52.31	57.72	53.25
TiO2	0.40	0.40	0.54	0.42	0.44	0.33	0.32	0.34	0.72	0.39
Al2O3	15.31	15.29	16.11	16.27	15.12	15.51	16.53	16.50	14.67	16.73
FeO*	7.96	9.35	8.72	7.84	9.56	7.84	7.46	8.73	10.39	8.14
MnO	0.15	0.19	0.16	0.15	0.17	0.15	0.16	0.18	0.17	0.17
MgO	7.32	8.25	6.99	5.79	7.78	5.85	5.41	7.03	5.90	7.75
CaO	7.94	9.53	8.90	8.50	8.91	7.79	8.31	9.32	6.11	9.92
Na2O	4.21	2.16	4.20	2.40	2.84	2.95	3.04	2.56	2.21	2.00
K2O	0.02	0.43	0.19	1.09	0.22	0.84	0.30	0.31	0.79	0.47
P2O5	0.08	0.05	0.06	0.12	0.06	0.09	0.07	0.07	0.07	0.13
sum	97.67	97.06	97.61	97.62	96.62	97.29	97.77	97.35	98.75	98.95
LOI	2.24	2.82	2.27	2.24	3.29	2.61	2.13	2.53	3.49	4.09
Total	99.92	99.88	99.89	99.86	99.91	99.90	99.90	99.88	102.24	103.04
Trace elements										
Ni, ppm	48	53	25	37	34	31	30	39	14	76
Cr	207	209	71	109	123	90	98	140	17	216
Sc	47.5	52.2	48.9	40.1	47.7	42.8	36.9	48.1	37.5	41.9
V	260	307	323	295	304	271	244	278	312	281
Ba	11	77	52	179	38	144	70	74	169	92
Rb	0.3	6.2	2.2	13.5	2.8	13.3	2.9	3.3	10.3	6.8
Sr	52	252	363	355	104	159	248	251	212	250
Zr	34	33	37	51	37	42	39	38	60	26
Y	16	12	14	13	13	12	12	12	19	14
Nb	0.81	0.63	0.99	1.87	0.75	0.83	0.76	0.74	0.68	0.45
Ga	12	13	15	17	14	12	13	14	16	15
Cu	43	30	95	157	117	109	49	180	93	10
Zn	63	75	69	70	81	69	77	91	89	65
Pb	1.39	1.89	2.18	2.45	1.57	1.92	2.05	2.26	2.01	2.02
Th	0.14	0.12	0.26	0.45	0.14	0.28	0.25	0.22	0.56	0.60
Ti	2393	2391	3248	2543	2659	2007	1940	2057	4331	2339
K	129	3602	1555	9073	1859	6989	2455	2600	6594	3921
P	328	231	264	526	241	384	325	303	308	568
La	1.75	1.36	3.05	5.15	1.46	2.93	2.38	2.28	3.03	2.88
Ce	3.97	3.04	6.26	10.47	3.15	5.74	4.69	4.45	7.79	5.76
Pr	0.63	0.49	0.95	1.45	0.53	0.81	0.68	0.65	1.24	0.87
Nd	3.57	2.82	4.67	6.84	2.97	3.87	3.38	3.21	6.56	4.53
Sm	1.31	1.09	1.56	1.91	1.13	1.20	1.10	1.11	2.39	1.50
Eu	0.48	0.48	0.60	0.70	0.46	0.46	0.44	0.41	0.76	0.50
Gd	1.79	1.52	1.93	2.06	1.61	1.45	1.46	1.55	2.91	1.77
Tb	0.34	0.28	0.35	0.35	0.30	0.27	0.27	0.28	0.54	0.32
Dy	2.33	1.96	2.30	2.23	2.10	1.79	1.86	1.88	3.48	2.09
Ho	0.52	0.43	0.49	0.47	0.46	0.39	0.42	0.43	0.72	0.46
Er	1.51	1.20	1.35	1.33	1.33	1.11	1.18	1.20	2.05	1.30
Tm	0.23	0.18	0.20	0.20	0.20	0.17	0.19	0.19	0.31	0.20
Yb	1.43	1.19	1.28	1.26	1.31	1.09	1.17	1.21	1.93	1.28
Lu	0.24	0.19	0.20	0.21	0.22	0.19	0.19	0.20	0.31	0.22
Hf	0.70	0.61	0.73	1.15	0.72	0.84	0.79	0.77	1.77	0.71
Ta	0.05	0.04	0.06	0.12	0.05	0.05	0.05	0.05	0.04	0.03
U	0.13	0.07	0.18	0.20	0.09	0.16	0.12	0.12	0.35	0.27
Cs	0.12	0.22	0.14	0.40	0.57	0.88	0.15	0.20	0.52	0.26

Note: * Total Fe expressed as FeO.
Note: PBv = Penon Blanco flows and flow breccias; PBvc = Penon Blanco volcaniclastic deposits.

Appendix 1. Table DR4. Continued

Sample Group	PB-129A PBvc	PB-02B PBvc	PB-55A PBvc	PB-54A PBvc	PB-35A PBvc	PB-101A PBvc	PB-101A replicate	PB-34D replicate
SiO2, wt.%	55.23	53.19	54.12	50.76	51.21	51.86	52.02	52.02
TiO2	0.36	0.57	0.45	0.40	0.27	0.54	0.54	0.54
Al2O3	15.42	17.07	14.63	13.68	14.46	17.58	17.64	17.64
FeO*	7.85	9.56	9.05	9.00	8.53	8.61	8.69	8.69
MnO	0.14	0.16	0.16	0.19	0.21	0.15	0.15	0.15
MgO	7.16	6.52	7.26	9.86	9.90	5.95	5.96	5.96
CaO	8.64	7.35	10.61	11.33	12.62	9.29	9.30	9.30
Na2O	3.61	3.85	2.03	2.14	1.29	4.20	4.21	4.21
K2O	0.23	0.90	0.29	0.56	0.42	0.25	0.24	0.24
P2O5	0.07	0.07	0.06	0.06	0.04	0.09	0.09	0.09
sum	98.70	99.25	98.64	97.98	98.94	98.50	98.84	98.84
LOI	3.14	3.08	3.83	4.54	3.11	3.93		
Total	101.84	102.33	102.47	102.52	102.05	102.44		
Trace elements								
Ni, ppm	67	27	51	68	48	18	19	32
Cr	223	82	218	340	287	54	53	102
Sc	40.0	47.8	45.5	49.3	59.1	35.4		
V	274	368	313	286	233	289		
Ba	56	95	47	72	62	80		
Rb	2.7	18.4	3.8	7.9	6.3	3.3		
Sr	172	357	162	172	211	288		
Zr	27	33	27	23	20	34	34	41
Y	13	13	14	14	11	14		
Nb	0.85	1.13	0.74	0.71	0.70	1.08		
Ga	13	14	12	12	10	18		
Cu	110	135	70	43	87	113		
Zn	66	80	71	67	80	68		
Pb	2.23	2.36	1.93	1.56	1.01	2.20		
Th	0.19	0.28	0.15	0.14	0.11	0.27		
Ti	2172	3431	2675	2400	1601	3248		
K	1890	7497	2425	4642	3481	2039		
P	288	317	257	250	189	377		
La	1.86	2.99	1.70	1.41	1.31	3.09		
Ce	3.95	6.34	3.72	3.20	2.89	7.15		
Pr	0.60	0.98	0.59	0.52	0.46	1.14		
Nd	3.16	4.80	3.23	2.90	2.46	5.93		
Sm	1.15	1.60	1.25	1.13	0.97	1.89		
Eu	0.44	0.62	0.47	0.42	0.37	0.74		
Gd	1.48	1.87	1.68	1.52	1.29	2.20		
Tb	0.28	0.34	0.33	0.29	0.25	0.37		
Dy	1.91	2.26	2.24	2.00	1.72	2.44		
Ho	0.42	0.47	0.49	0.44	0.37	0.51		
Er	1.21	1.32	1.40	1.26	1.04	1.46		
Tm	0.19	0.20	0.21	0.19	0.15	0.21		
Yb	1.19	1.30	1.35	1.23	1.00	1.36		
Lu	0.20	0.22	0.23	0.20	0.17	0.22		
Hf	0.69	0.93	0.76	0.61	0.50	0.94		
Ta	0.06	0.07	0.05	0.04	0.05	0.07		
U	0.11	0.12	0.09	0.11	0.08	0.15		
Cs	0.21	0.83	0.16	0.27	0.33	0.51		

Note: * Total Fe expressed as FeO. Replicates were only ran via XRF
Note: PBv = Penon Blanco flows and flow breccias; PBvc = Penon Blanco volcaniclastic deposits.

Table DR5. Parameters used in melting models.

	Distribution Coefficients for mantle minerals[1]					Bulk compositions for source lithologies[2]		
	Olivine	**Opx**	**Cpx**	**Spinel**	**Garnet**	**MORB Source**	**E-MORB Source**	**Primitive mantle**
La	0.0004	0.0020	0.0540	0.01	0.0100	0.21	1.8	0.55
Ce	0.0005	0.0030	0.0980	0.01	0.0210	0.72	4.02	1.4
Nd	0.0010	0.0068	0.2100	0.01	0.0870	0.82	2.49	1.08
Sm	0.0013	0.0100	0.2600	0.01	0.2170	0.3	0.73	0.35
Eu	0.0016	0.0130	0.3100	0.01	0.3200	0.12	0.24	0.13
Gd	0.0015	0.0160	0.3000	0.01	0.4980	0.42	0.83	0.46
Tb	0.0015	0.0190	0.3100	0.01	0.7500	0.08	0.14	0.08
Dy	0.0017	0.0220	0.3300	0.01	1.0600	0.53	0.85	0.57
Ho	0.0016	0.0260	0.3100	0.01	1.5300	0.12	0.18	0.13
Er	0.0015	0.0300	0.3000	0.01	2.0000	0.35	0.49	0.37
Tm	0.0015	0.0400	0.2900	0.01	3.0000	0.05	0.07	0.06
Yb	0.0015	0.0490	0.2800	0.01	4.0300	0.35	0.42	0.37
Lu	0.0015	0.0600	0.2800	0.01	5.5000	0.05	0.06	0.06
K	0.0002	0.0010	0.0020	0.00	0.0010	20	548	200
Sr	0.0002	0.0070	0.1300		0.0011	14.7	70	20
Y	0.0050	0.0280	0.2950		2.1100	3.18	4.38	3.45
Sc	0.1600	0.3300	1.7000		2.2700	12	12.87	12
Ti	0.0200	0.1000	0.1800	0.1500	0.2800	1020	2098	1020
Zr	0.0100	0.0300	0.1000		0.3200	7.19	19.34	8.51
Hf		0.0100	0.2200		0.2500	0.22	0.57	0.25
Nb	0.0050	0.0050	0.0200		0.0700	0.39	2.85	0.54
Ta	0.0050	0.0050	0.0200		0.0400	0.02	0.15	0.03
Th	0.0001	0.0001	0.0003		0.0001	0.01	0.19	0.07

	Modal compositions for source lithologies[2]			Melt Proportions for models shown[3]	
	Spinel Lherzolite	**Garnet-4 Lherzolite**	**Garnet-6 Lherzolite**	**Spinel Lherzolite**	**Garnet-4 Lherzolite**
Olivine	63	66	66	8	5
Opx	19	14	14	16	5
Cpx	16	14	16	74	40
Spinel	2	0	0	2	0
Garnet	0	6	4	0	50

1. Kd-values from Mackenzie and O'nions (1991,1995) and Zack et al. (1997).
2. Values from Mackenzie and O'Nions (1995).
3. Melt proportions used to generate data shown in figures 10 &11.

Appendix 1. Table DR6. GPS data for samples.

Sample	Lattitue	Longitude
PB-76	37.6577	-120.269
PB-74	37.66459	-120.2139
PB-72	37.65619	-120.2015
PB-71	37.65469	-120.1948
PB-69	37.65106	-120.1884
PB-68	37.65871	-120.242
PB-67	37.65833	-120.2514
PB-60	37.84127	-120.3803
PB-57	37.59359	-120.1584
PB-56	37.60237	-120.1638
PB-55	37.60476	-120.1696
PB-54	37.60536	-120.1705
PB-52	37.76903	-120.3251
PB-51	37.76288	-120.3301
PB-49	37.75644	-120.3248
PB-47	37.7514	-120.3282
PB-46	37.7497	-120.3273
PB-45	37.74926	-120.3301
PB-40	37.71343	-120.325
PB-39	37.70983	-120.3363
PB-35	37.70806	-120.2469
PB-34	37.70584	-120.2282
PB-156	37.78128	-120.3795
PB-145	37.76527	-120.356
PB-103	37.60568	-120.2023
PB-101	37.56659	-120.1318
PB-06	37.76288	-120.3301
PB-02	37.70582	-120.2279
PB-73	37.65936	-120.2057
PB-150	37.8002	-120.413

Note: Samples with samenumber and different letter notation are from same GPS point and different location in section