APPENDIX TABLES

Table A2. XRF analytical results for samples from drill hole AP5 (Areachap)

Sample No.	AP5/19	AP5/20	AP5/21	AP5/22	AP5/23	AP5/24	AP5/25	AP5/26	AP5/27	AP5/28	AP5/29	AP5/30	AP5/31	AP5/32	AP5/33	AP5/34
Depth (m)	243.2	253.4	269.9	282.7	277.6	281.4	298.5	311.5	306.1	318.8	317.4	318.9	322.7	326.8	336.8	335.7
Rock Name	Sil-Crd-Bt-Gn	Bt-Gn	Sil-Crd-Bt-Gn	Garnet-Sil-Crd-Bt-Gn	Sil-Crd-Bt-Gn	Sil-Crd-Bt-Gn	Sil-Crd-Bt-Gn	Garnet-Crd-Gn	Garnet-Sil-Crd-Bt-Gn	Garnet-Sil-Crd-Bt-Gn	Sil-Crd-Bt-Gn	Sil-Crd-Bt-Gn	Hbl-Schist	Sil-Crd-Gn	Amphibolite	Bt-Hbl Gn
SiO_2 (wt%)	65.7	66.89	65.25	70.51	67.44	75.03	72.59	64.25	56.41	70.12	78.07	73.05	53.1	71.03	51.14	60.7
TiO_2	0.8	0.4	0.37	0.47	0.3	0.25	0.25	0.56	0.55	0.27	0.25	0.29	1.3	0.25	0.89	0.96
Al_20_3	13.75	13.91	13.23	11.85	10.89	11.6	11.63	14.9	14.11	15.02	9.2	11.64	13.92	11.84	14.62	14.12
Fe_2O_3	9.26	6.62	9.61	7.01	13.55	4.51	7.32	7.69	12.61	9.91	4.5	6.36	18.78	7.69	14.64	11.88
MnO	0.19	0.14	0.1	0.08	0.08	0.05	0.13	0.11	0.17	0.13	0.06	0.09	0.23	0.11	0.29	0.36
MgO	2.67	2.55	5.98	4.21	3.86	3.24	2.34	4.68	7.27	3.12	2.65	3.99	8.86	4.7	4.65	1.39
CaO	2.31	0.56	0.05	0.34	n.d.	0.23	0.01	0.76	0.56	0.02	0.07	n.d.	1.01	0.03	7.94	4.22
Na_2O	3.56	5.47	0.32	0.82	0.23	1.42	0.38	2.23	1.51	0.1	1.03	0.49	0.9	0.35	4.22	4.56
K_2O	0.79	0.32	2.65	2.15	1.54	1.42	1.57	1.47	1.25	0.91	1.34	1.48	0.37	1.55	1.35	1.11
P_2O_5	0.27	0.13	0.12	0.18	0.04	0.06	0.04	0.21	0.07	0.06	0.05	0.05	0.27	0.05	0.13	0.48
LOI	0.96	2.18	2.26	2.47	2.59	2.14	1.79	3.37	1.25	0.24	1.61	2.41	1.34	2.14	0.47	0.62
Total:	100.26	99.20	99.93	100.11	100.52	99.94	98.05	100.23	95.78	99.91	98.84	99.85	100.07	99.73	100.34	100.42
Trace elements (ppm)																
Cl	< 8	< 8	15	18	< 8	< 8	< 8	< 8	< 8	< 8	17	< 8	< 8	< 8	50	26
Co	42	28	39	33	50	27	39	33	54	48	38	40	60	38	61	43
Cr	10	10	10	10	10	10	10	10	16	10	16	10	15	10	19	10
S	381	637	1139	< 16	27647	< 16	< 16	92	247	< 16	< 16	1542	< 16	74	< 16	56
Sc	19	11	18	16	13	9	13	18	23	12	12	14	35	13	29	23
V	6	1	31	12	1	6	1	27	174	1	1	2	260	1	378	1
As	3	3	4	3	3	3	3	3	3	4	4	3	26	4	3	3
Cu	22	9	57	3	137	2	3	3	16	2	2	37	2	11	28	14
Ga	17	16	14	14	19	12	16	15	24	21	10	17	19	15	16	21
Mo	1	1	21	3	1	1	2	1	1	1	1	1	1	3	1	1
Nb	5	6	6	8	5	6	5	5	6	4	3	4	3	5	2	3
Ni	5	3	3	3	3	3	3	4	7	3	9	3	11	6	9	4
Pb	6	49	3	3	3	3	3	29	3	3	15	22	39	21	9	6
Rb	25	70	63	46	31	31	36	37	24	17	43	38	13	45	40	36
Sr	158	28	9	29	9	48	8	66	52	6	30	12	23	15	171	167
Th	3	3	3	3	3	3	6	3	7	6	3	5	3	3	3	3
U	3	3	3	3	3	3	6	3	3	5	3	3	3	3	3	3
W[1]	339	279	184	213	362	210	355	147	237	500	377	408	162	281	111	253
Y	40	51	34	60	56	67	67	25	21	89	43	61	29	49	22	45
Zn	68	257	49	49	38	32	53	48	109	34	51	101	96	92	99	151
Zr	144	209	150	197	195	241	161	107	175	225	150	187	80	203	43	80
Ba	336	656	1423	1328	1474	881	1008	967	623	1115	659	751	237	705	325	535
La	29	8	5	7	14	6	13	17	28	14	5	23	44	18	47	33
Ce	28	37	39	39	25	46	29	22	62	54	40	48	8	42	6	26

[1]: Semi-quantitative analysis; Hbl- hornblende; Bt- biotite; Gn- gneiss; Sil- sillimanite; Crd- cordierite and n.d.- Not detected.
Wt%- weight percent; ppm- part per million

Table A2. *(Cont.)*

Fused	AP5/35	AP5/36	AP5/37	AP5/38	AP5/39	AP5/40	AP5/41	AP5/42	AP5/43	AP5/44	AP5/45	AP5/46
Depth (m)	334.2	331.3	328.4	327.4	339	338	341.4	343.7	344.7	349	354.8	360.1
Rock Name	Bt-Gn	Gneiss	Sil-Crd-Schist	Garnet-Hbl-Schist	Amphibolite	Bt-Hbl-Gneiss	Hbl-Gneiss	Garnet-Bt-Gn	Hbl-Garnet-Bt- Gneiss	Hbl-Gn	Hbl-Bt-Gn	Amphibolite
SiO_2 (wt%)	68.26	74.38	66.37	55.85	49.57	51.69	56.38	73.83	59.51	70.5	69.61	46.85
TiO_2	0.31	0.29	0.49	0.51	1.04	0.89	1.2	0.23	0.46	0.32	0.44	1.9
Al_20_3	13.05	11.23	12.74	15.31	14.56	14.63	13.8	12.32	12.43	12.12	12.67	13.44
Fe_2O_3	6.28	4.92	8.91	10.59	15.08	14.09	13.34	4.23	10.17	5.86	6.47	17.02
MnO	0.15	0.11	0.16	0.22	0.34	0.4	0.33	0.17	0.24	0.14	0.16	0.26
MgO	1.92	0.5	4.88	5.89	4.54	4.55	2.4	0.41	2.39	0.91	1.26	7.1
CaO	3.26	1.09	n.d.	4.99	8.2	7.37	6.12	1.73	7.09	2.22	3.66	10.12
Na_2O	4.36	5.52	0.33	2.92	3.87	3.9	4.31	4.83	2.54	4.15	3.12	1.82
K_2O	1.13	0.41	2.32	1.32	1.65	0.99	1.21	0.64	2.22	0.96	1.42	0.77
P_2O_5	0.08	0.06	0.06	0.1	0.14	0.13	0.6	0.07	0.13	0.08	0.06	0.24
LOI	0.78	0.55	3.32	1.76	0.65	0.85	0.46	0.48	0.85	0.94	0.91	0.79
Total:	99.59	99.08	99.58	99.46	99.64	99.49	100.14	98.96	98.06	98.20	99.78	100.31
Trace elements (ppm)												
Cl	23	< 8	< 8	< 8	108	40	29	13	33	16	182	36
Co	35	34	35	46	60	57	45	30	44	36	39	68
Cr	18	10	10	52	23	18	10	10	17	10	12	143
S	< 16	140	497	400	452	203	69	180	< 16	< 16	34	780
Sc	14	9	21	37	33	30	32	7	20	14	11	36
V	49	12	11	198	384	301	30	1	103	34	58	390
As	3	3	3	3	3	3	3	3	3	6	3	4
Cu	11	20	25	23	72	51	18	20	3	8	16	75
Ga	16	18	17	15	16	18	18	15	16	17	17	17
Mo	1	1	1	1	1	1	1	1	1	1	1	1
Nb	6	7	5	3	2	4	3	7	3	7	6	2
Ni	12	5	3	27	16	13	3	4	10	4	9	62
Pb	6	4	130	6	4	14	4	11	3	3	9	7
Rb	36	15	81	54	59	24	52	37	79	40	34	46
Sr	153	71	13	95	136	174	151	169	337	177	190	86
Th	5	3	4	3	3	5	3	5	3	3	4	3
U	4	3	3	3	3	3	3	3	3	3	3	3
W[1]	238	389	165	114	95	119	154	329	190	362	300	94
Y	55	82	46	27	25	40	36	53	35	57	65	36
Zn	95	54	181	111	105	129	114	99	96	90	125	170
Zr	232	241	201	71	47	68	55	167	76	180	200	72
Ba	604	157	959	1496	456	327	302	376	490	381	482	90
La	34	25	26	5	41	34	42	13	44	17	32	31
Ce	45	45	41	15	15	19	19	46	33	40	44	10

Hbl- hornblende; Bt- biotite; Gn- gneiss; Sil- sillimanite; Crd- cordierite and n.d.- Not detected.
Wt%- weight percent; ppm- part per million

Table A4. XRF analytical results for samples from drill hole KN11 (Kantienpan)

Fused	KN11/20	KN11/21	KN11/22	KN11/23	KN11/24	KN11/25	KN11/26	KN11/27	KN11/28	KN11/29	KN11/30	KN11/31	KN11/32	KN11/33
Depth (m)	136.80	142.70	149.55	154.43	159.60	165.66	172.20	175.80	182.40	188.32	195.35	196.84	198.80	205
Rock Name	Bt-Gn	Bt-Gn	Bt-Gn	Bt-Hbl-Gn	Bt-Hbl-Gn	Sil-Crd-Bt-Gn	Crd-Gn	Crd-Bt-Gn	Crd-Bt-Gn	Bt-Gn	Bt-Hbl-Gn	Bt-Hbl-Gn	Hbl-Gn to Amphibolite	Bt-Sil-Crd-Gn
SiO_2 (wt%)	73.2	72.5	72.24	47.61	49.88	64.71	68.22	67.84	66.73	61.96	51.34	45.23	48.81	85.96
TiO_2	0.47	0.47	0.21	0.81	0.71	0.46	0.35	0.37	0.44	0.5	0.81	1.24	1.45	0.08
Al_20_3	12.72	13.97	12.8	17.9	18.14	14.15	14.29	14.24	14.19	16.5	18.43	17.05	14.95	3.91
Fe_2O_3	4.59	2.91	1.78	11.83	11.2	5.53	5.92	5.77	6.12	8.37	9.87	15.35	16.32	3.95
MnO	0.12	0.07	0.04	0.29	0.21	0.05	0.18	0.16	0.1	0.21	0.25	0.28	0.28	0.06
MgO	0.83	0.67	0.33	6.08	5.11	1.4	1.69	2.74	1.48	1.94	3.75	5.26	4.34	1.72
CaO	2.46	1.53	1.33	7.45	8.62	1.14	1.65	2.02	1.4	5.65	8.39	11.94	9.31	0.05
Na_2O	4.35	4.49	3.12	3.53	4.29	2.37	2.24	2.52	3.21	2.61	3.91	2.01	2.81	0.17
K_2O	0.91	2.7	5.45	2.08	0.94	3.01	2.75	3.07	2.8	1.35	0.82	0.39	0.36	0.4
P_2O_5	0.11	0.05	0.07	0.21	0.18	0.05	0.06	0.08	0.09	0.14	0.24	0.22	0.31	0.03
LOI	0.23	0.26	0.7	1.15	0.61	3.15	1.85	1.25	2.46	0.7	1.69	0.65	0.55	1.87
Total:	100.01	99.64	98.08	99.01	98.94	96.04	99.18	100.04	99.03	99.93	99.51	99.64	99.47	98.23
Trace elements (ppm)														
Cl	9	< 8	55	159	98	< 8	< 8	19	68	96	89	53	64	14
Co	37	27	27	50	48	29	36	33	29	39	39	56	54	41
Cr	10	10	10	52	46	10	10	10	10	19	40	41	26	10
S	140	< 16	< 16	173	140	18678	13916	8408	10108	1140	4602	1076	733	8384
Sc	11	11	1	22	22	9	10	17	18	23	30	25	33	2
V	7	2	18	287	278	3	22	27	8	125	284	490	458	2
As	3	3	3	3	3	3	3	7	3	3	6	3	10	3
Cu	45	4	2	161	197	9	17	8	12	22	72	284	185	235
Ga	14	13	12	18	17	17	14	15	15	17	21	20	19	10
Mo	1	1	1	1	1	1	2	1	1	1	1	1	1	1
Nb	6	6	7	5	3	7	7	5	5	5	8	3	3	2
Ni	4	4	4	25	23	5	4	5	3	11	14	16	8	3
Pb	5	12	32	13	11	25	26	20	31	23	182	27	12	233
Rb	9	45	137	53	17	46	37	53	38	55	24	20	9	13
Sr	232	140	144	314	202	128	119	136	194	90	345	479	414	23
Th	5	7	20	3	3	6	4	7	3	6	5	3	3	3
U	3	3	6	3	3	3	3	3	3	4	6	3	3	3
W[1]	456	300	312	77	99	302	325	307	253	233	135	158	133	519
Y	31	33	25	18	15	41	40	37	45	29	32	19	26	23
Zn	60	41	40	115	77	92	100	113	82	128	262	200	189	214
Zr	165	189	152	44	38	163	145	137	156	81	49	35	50	51
Ba	485	676	1113	633	256	569	1044	902	887	512	312	117	221	2260
La	16	22	20	43	43	22	23	14	15	24	27	33	51	5
Ce	46	66	83	37	22	56	49	47	58	43	31	24	25	33

Bt- biotite; Gn- gneiss; Crd- cordierite and n.d.- Not detected.
Wt%- weight percent; ppm- part per million

Table A4. *(Cont.)*

Fused	**KN11/38**	**KN11/39**	**KN11/40**	**KN11/41**	**KN11/42**	**KN11/43**	**KN11/44**	**KN11/45**
Depth (m)	210.66	212.16	216.23	217.73	217.8	218.19	226.69	224.06
Rock Name	Garnet-Bt-Crd-Gn	Bt-Crd-Gn	Bt-Crd-Gn	Sil-Bt-Crd-Gn	Sil-Crd-Bt-Gn	Sil-Bt-Crd-Gn	Sil-Bt-Gn	Amphibolite
SiO_2 (wt%)	78.43	76.69	75.12	75.22	75.86	79.52	68.55	44.7
TiO_2	0.09	0.09	0.12	0.13	0.13	0.09	0.36	0.86
Al_20_3	8.85	9.33	9.67	10.77	10.56	7.47	11.19	19.15
Fe_2O_3	7.86	7.85	8.26	8.04	7.77	7.62	7.34	12.94
MnO	0.1	0.06	0.12	0.06	0.09	0.08	0.21	0.32
MgO	2.81	3.6	4.11	2.97	2.83	2.72	4.25	5.64
CaO	n.d.	n.d.	0.04	n.d.	n.d.	0.02	2.84	11.62
Na_2O	0.13	0.13	0.16	0.18	0.26	0.23	2.16	2.16
K_2O	0.58	0.8	1.16	1.17	1.17	0.85	1.39	0.21
P_2O_5	0.02	0.02	0.03	0.02	0.03	0.02	0.05	0.24
LOI	0.75	0.99	1.34	0.87	1.19	1.2	0.47	0.43
Total:	99.62	99.60	100.11	99.44	99.89	99.83	98.83	98.28
Trace elements (ppm)								
Cl	214	279	247	254	416	286	296	247
Co	52	46	45	43	46	44	41	49
Cr	10	10	10	10	10	10	10	54
S	3476	4959	4853	1272	6230	9094	430	1146
Sc	7	4	5	6	5	4	12	22
V	1	1	1	1	1	1	57	280
As	3	4	3	3	3	3	3	3
Cu	192	54	71	39	141	274	10	45
Ga	17	17	16	16	16	14	15	19
Mo	1	1	1	1	1	1	1	1
Nb	4	4	5	4	4	3	17	3
Ni	3	4	4	3	4	3	9	27
Pb	3	12	3	8	10	11	5	13
Rb	16	24	35	28	31	23	38	9
Sr	10	13	13	13	11	18	142	428
Th	3	4	3	4	5	7	16	3
U	3	3	3	3	3	3	3	3
W[1]	585	486	398	388	435	421	308	143
Y	52	18	30	18	23	17	34	22
Zn	111	85	263	133	903	111	125	226
Zr	143	135	161	173	169	118	185	35
Ba	1036	2940	494	714	944	1037	1048	86
La	9	5	24	16	10	5	35	50
Ce	12	15	22	26	30	21	115	25

Hbl- hornblende; Bt- biotite; Gn- gneiss; Sil- sillimanite; Crd- cordierite; n.a.- not applicable and n.d- Not detected.
[2]: recalculated total for sulphide-en riched samples (S, Cu, Zn and Pb) based on the powder disc analysis.
Wt%- weight percent; ppm- part per million

Table A4. *(Cont. Sulfide-rich samples)*

Fused	**KN11/34**	**KN11/35**	**KN11/36**	**KN11/37**
Depth (m)	206.57	206.95	208.25	209.2
Rock Name	Bt-Garnet-Crd-Gn	Ore Zone	Ore Zone	Ore Zone
SiO_2	59.71	14.00	13.15	13.66
TiO_2	0.05	0.30	0.10	0.02
Al_2O_3	12.01	4.38	1.30	1.42
Fe	12.87	35.67	43.24	40.56
Mn	0.13	0.28	0.19	0.18
MgO	1.99	3.18	2.82	2.00
CaO	3.26	2.98	0.90	0.27
Na_2O	0.78	0.00	0.00	0.00
K_2O	0.64	0.28	0.10	0.07
P_2O_5	0.06	0.04	0.04	0.03
S	5.77	25.66	26.53	27.90
Cu	0.15	0.78	0.59	0.59
Zn	0.80	12.21	10.59	13.00
Pb	0.16	0.04	0.07	0.06
Total	98.38	99.80	99.62	99.76
Trace elements (ppm)				
Cl	< 8	< 8	9	< 8
Co	64	93	97	99
Cr	10	17	10	10
Sc	1	1	1	1
V	1	7	5	6
As	3	3	3	3
Ga	34	2	2	2
Mo	1	13	62	54
Nb	4	3	3	4
Ni	7	27	21	15
Rb	12	17	11	5
Sr	119	40	56	4
Th	13	11	3	3
U	3	8	5	3
W[1]	327	195	163	157
Y	40	13	6	4
Zr	107	44	12	15
Ba	3859	1328	2311	31
La	5	37	6	55
Ce	37	17	6	6

Hbl- hornblende; Bt- biotite; Gn- gneiss; Sil- sillimanite; Crd- cordierite; n.a.- not applicable and n.d- Not detected.
[2]: recalculated total for sulphide-enriched samples (S, Cu, Zn and Pb) based on the powder disc analysis.
Wt%- weight percent; ppm- part per million

Table A5. Composition of plagioclase grains in rocks adjacent to the ore zone from Areachap and Kantienpan.

Sample	**AP5/20**	**AP5/21**	**AP5/22**	**AP5/25**	**AP5/31**	**AP5/35**	**AP5/38**	**AP5/40**	**AP5/41**	**AP5/42**
n	3	3	3	3	2	6	3	3	2	3
(%)										
SiO_2	67.10	66.21	64.19	65.64	67.44	64.16	64.99	62.29	65.85	65.15
TiO_2	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01
Al_2O_3	20.66	21.05	22.04	21.30	19.04	22.43	21.34	23.63	19.69	21.98
Cr_2O_3	0.01	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00
FeO	0.02	0.21	0.07	0.02	0.07	0.05	0.02	0.07	0.14	0.04
MnO	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01
MgO	0.00	0.26	0.01	0.00	0.01	0.00	0.01	0.00	0.05	0.01
CaO	1.34	1.50	2.80	2.20	0.11	3.58	2.67	4.88	0.96	2.96
Na_2O	10.75	10.35	9.72	10.25	11.32	9.31	10.02	8.38	10.67	9.56
K_2O	0.08	0.15	0.20	0.04	0.02	0.17	0.06	0.18	0.09	0.18
ZnO	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.01
NiO	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00
F	0.01	0.00	0.04	0.03	0.00	0.05	0.03	0.03	0.06	0.02
Cl	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Total	*100.01*	*99.77*	*99.13*	*99.51*	*98.05*	*99.76*	*99.15*	*99.50*	*97.50*	*99.92*
Formula 8(O)										
Si	2.94	2.91	2.85	2.90	3.00	2.84	2.88	2.77	2.96	2.87
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.07	1.09	1.15	1.11	1.00	1.17	1.12	1.24	1.04	1.14
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe++	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.06	0.07	0.13	0.10	0.01	0.17	0.13	0.23	0.05	0.14
Na	0.91	0.88	0.84	0.88	0.98	0.80	0.86	0.72	0.93	0.82
K	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01
Total	*4.99*	*4.99*	*4.99*	*4.99*	*4.99*	*4.98*	*4.99*	*4.98*	*4.99*	*4.98*
End Members (%)										
Albite	*93.13*	*91.81*	*85.28*	*89.19*	*99.38*	*81.71*	*86.90*	*74.85*	*94.81*	*84.51*
Anorthirte	*6.40*	*7.34*	*13.57*	*10.56*	*0.53*	*17.34*	*12.78*	*24.09*	*4.69*	*14.46*
K-Feldsp.	*0.47*	*0.86*	*1.15*	*0.25*	*0.09*	*0.95*	*0.32*	*1.06*	*0.50*	*1.03*

Table A5. (Cont.)

Sample	AP5/43	AP5/44	AP5/45	KN11/3	KN11/9	KN11/11	KN11/12	KN11/19	KN11/20	KN11/25
n	3	3	3	16	3	12	6	9	3	12
(%)										
SiO_2	64.12	69.23	62.03	60.37	59.56	60.77	60.30	64.45	62.73	59.52
TiO_2	0.01	0.00	0.02	0.03	0.01	0.03	0.02	0.02	0.02	0.90
Al_2O_3	22.79	19.41	22.29	24.75	24.68	24.75	24.75	22.02	23.49	24.41
Cr_2O_3	0.00	0.01	0.00	0.02	0.01	0.00	0.01	0.02	0.01	0.01
FeO	0.03	0.03	0.05	0.06	0.18	0.10	0.11	0.06	0.01	0.14
MnO	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.02
CaO	3.79	0.10	4.37	5.96	6.99	6.13	6.53	3.00	4.88	5.67
Na_2O	9.32	11.20	8.86	8.20	7.57	7.82	7.81	9.85	8.34	7.86
K_2O	0.11	0.06	0.13	0.16	0.20	0.30	0.18	0.08	0.44	0.18
ZnO	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01
NiO	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
F	0.02	0.03	0.02	0.10	0.01	0.03	0.03	0.06	0.06	0.09
Cl	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Total	*100.20*	*100.07*	*97.82*	*99.67*	*99.24*	*99.95*	*99.77*	*99.59*	*100.06*	*98.83*
Formula 8(O)										
Si	2.82	3.01	2.81	2.70	2.68	2.70	2.69	2.85	2.78	2.68
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Al	1.18	1.00	1.19	1.30	1.31	1.30	1.30	1.15	1.23	1.30
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe++	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.18	0.00	0.21	0.29	0.34	0.29	0.31	0.14	0.23	0.27
Na	0.80	0.94	0.78	0.71	0.66	0.67	0.68	0.85	0.72	0.69
K	0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.00	0.03	0.01
Total	4.99	4.96	4.99	5.01	5.00	4.99	5.00	5.00	4.98	4.99
End Members (%)										
Albite	*81.15*	*99.20*	*78.01*	*70.68*	*65.46*	*68.56*	*67.69*	*85.22*	*73.62*	*70.73*
Anorthirte	*18.22*	*0.47*	*21.26*	*28.39*	*33.42*	*29.71*	*31.28*	*14.35*	*23.80*	*28.20*
K-Feldsp.	*0.63*	*0.33*	*0.73*	*0.93*	*1.12*	*1.73*	*1.03*	*0.44*	*2.58*	*1.07*

Table A5. (Cont.)

Sample	KN11/27	KN11/28	KN11/29	KN11/32	KN11/33	KN11/40	KN11/44
n	6	6	8	6	3	3	5
(%)							
SiO_2	59.84	63.16	56.40	54.15	57.82	48.81	58.15
TiO_2	0.02	0.02	0.02	0.02	0.00	0.02	0.02
Al_2O_3	25.22	22.49	27.57	29.12	26.45	32.35	26.50
Cr_2O_3	0.00	0.01	0.00	0.00	0.00	0.02	0.00
FeO	0.00	0.03	0.08	0.17	0.31	0.01	0.07
MnO	0.01	0.00	0.01	0.01	0.02	0.02	0.01
MgO	0.07	0.00	0.01	0.00	0.03	0.20	0.00
CaO	6.98	4.07	9.33	10.96	8.17	15.72	8.36
Na_2O	7.41	8.84	6.08	4.84	6.62	2.46	6.54
K_2O	0.21	0.16	0.15	0.12	0.05	0.08	0.13
ZnO	0.02	0.01	0.00	0.01	0.01	0.00	0.01
NiO	0.00	0.00	0.01	0.00	0.00	0.00	0.00
F	0.01	0.01	0.03	0.03	0.05	0.06	0.02
Cl	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Total	*99.78*	*98.82*	*99.68*	*99.44*	*99.54*	*99.74*	*99.83*
Formula 8(O)							
Si	2.67	2.82	2.54	2.45	2.60	2.24	2.60
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.33	1.18	1.46	1.56	1.40	1.75	1.40
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe++	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Ca	0.33	0.19	0.45	0.53	0.39	0.77	0.40
Na	0.64	0.77	0.53	0.43	0.58	0.22	0.57
K	0.01	0.01	0.01	0.01	0.00	0.00	0.01
Total	4.99	4.97	5.00	4.98	4.99	5.00	4.98
End Members (%)							
Albite	*64.96*	*78.98*	*53.66*	*44.10*	*59.30*	*21.97*	*58.18*
Anorthirte	*33.84*	*20.07*	*45.50*	*55.21*	*40.42*	*77.56*	*41.05*
K-Feldsp.	*1.20*	*0.95*	*0.84*	*0.69*	*0.27*	*0.47*	*0.77*

Table A6. Chemical composition of pyroxene grains close to the ore zone from Areachap and Kantienpan.

Sample	**AP5/38**	**KN11/3***	**KN11/9**	**KN11/11***	**KN11/12***	**KN11/18**	**KN11/19***	**KN11/20**	**KN11/27**	**KN11/38**	**KN11/40**	**KN11/44**
n	3	14	3	14	8	4	12	3	6	2	3	3
(%)												
SiO_2	54.93	49.64	49.21	49.03	49.24	50.51	48.40	50.06	51.64	48.92	49.78	51.45
TiO_2	0.04	0.10	0.09	0.14	0.12	0.07	0.11	0.11	0.12	0.02	0.03	0.04
Al_2O_3	1.19	3.46	1.60	0.71	0.80	0.58	0.99	1.16	3.47	4.77	3.87	3.41
Cr_2O_3	0.00	0.01	0.00	0.01	0.02	0.01	0.01	0.00	0.01	0.02	0.01	0.01
FeO	23.05	24.38	31.32	32.84	33.33	28.44	36.34	33.26	19.40	26.87	21.70	22.10
MnO	1.03	3.04	2.59	1.82	1.86	2.17	1.75	1.63	2.65	1.78	1.03	1.57
MgO	17.36	18.86	13.57	13.49	13.54	15.75	13.00	12.82	21.99	16.29	22.81	20.79
CaO	1.27	0.13	0.26	0.59	0.89	1.13	0.18	0.22	0.16	0.19	0.18	0.20
Na_2O	0.10	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.01	0.02	0.01
K_2O	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.01
ZnO	0.07	0.14	0.12	0.15	0.10	0.04	0.08	0.07	0.10	0.07	0.18	0.08
NiO	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00
F	0.08	0.10	0.03	0.03	0.05	0.01	0.07	0.00	0.05	0.03	0.02	0.03
Cl	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Total	*99.12*	*99.90*	*98.84*	*98.85*	*99.97*	*98.74*	*100.98*	*99.37*	*99.62*	*98.97*	*99.63*	*99.71*
Formula 6(O)												
Si	2.07	1.89	1.96	1.97	1.95	1.99	1.91	1.99	1.92	2.07	1.91	1.93
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.05	0.16	0.08	0.03	0.04	0.03	0.05	0.05	0.15	0.05	0.18	0.15
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
Fe3+	0.00	0.06	0.00	0.03	0.05	0.00	0.12	0.00	0.00	0.00	0.00	0.00
Fe2+	0.73	0.72	1.05	1.07	1.05	0.94	1.08	1.11	0.60	0.73	0.93	0.69
Mn	0.03	0.10	0.09	0.06	0.06	0.07	0.06	0.05	0.08	0.03	0.04	0.05
Mg	0.97	1.07	0.81	0.81	0.80	0.92	0.77	0.76	1.22	0.97	0.93	1.16
Ca	0.05	0.01	0.01	0.03	0.04	0.05	0.01	0.01	0.01	0.05	0.01	0.01
Na	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	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
Total	*3.91*	*4.00*	*4.00*	*4.00*	*4.00*	*4.00*	*4.00*	*3.98*	*4.00*	*3.91*	*3.99*	*4.00*
End Members (%)												
Enstatite	*55.64*	*59.73*	*43.32*	*42.38*	*42.34*	*48.43*	*41.31*	*40.52*	*66.68*	*55.64*	*49.80*	*62.37*
Ferrosilite	*41.45*	*39.98*	*56.08*	*56.29*	*55.66*	*49.06*	*58.27*	*58.97*	*32.99*	*41.45*	*49.75*	*37.19*
Wolastonite	*2.92*	*0.29*	*0.60*	*1.33*	*2.00*	*2.50*	*0.42*	*0.51*	*0.34*	*2.92*	*0.45*	*0.44*

* Calculated Fe^{3+} based on mineral stoichiometry.

Table A7. Chemical composition of cordierite grains near the ore zone from Areachap and Kantienpan.

Sample	**AP5/23**	**AP5/28**	**AP5/29**	**AP5/32**	**KN11/3**	**KN11/25**	**KN11/27**	**KN11/33**	**KN11/34**	**KN11/38**
n	9	15	7	3	18	4	3	3	3	2
(%)										
SiO_2	48.93	48.18	48.54	49.32	48.14	50.38	49.69	50.09	50.05	49.23
TiO_2	0.00	0.01	0.02	0.02	0.01	0.02	0.01	0.00	0.01	0.01
Al_2O_3	32.71	33.95	33.71	32.98	33.77	34.79	33.15	33.41	33.48	33.07
Cr_2O_3	0.01	0.01	0.01	0.00	0.01	0.04	0.00	0.01	0.01	0.01
FeO	7.40	7.30	6.68	5.09	6.06	1.71	4.01	3.56	2.44	6.68
MnO	0.31	0.04	0.36	0.42	0.77	0.44	0.57	0.54	0.73	0.33
MgO	8.64	9.68	9.70	9.93	10.00	12.78	10.57	11.06	11.60	9.25
CaO	0.00	0.02	0.00	0.01	0.04	0.00	0.02	0.01	0.01	0.02
Na_2O	0.18	0.11	0.20	0.18	0.10	0.07	0.13	0.19	0.10	0.08
K_2O	0.01	0.01	0.01	0.00	0.02	0.01	0.07	0.00	0.00	0.01
ZnO	0.02	0.01	0.02	0.01	0.02	0.00	0.01	0.09	0.05	0.03
NiO	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01
F	0.02	0.06	0.03	0.01	0.03	0.01	0.03	0.01	0.10	0.02
Cl	0.01	0.00	0.01	0.01	0.01	0.02	0.00	0.01	0.01	0.00
Total	98.25	99.38	99.28	98.00	98.97	100.25	98.25	98.99	98.59	98.70
Formula 18(O)										
Si	5.026	4.897	4.954	5.027	4.901	4.949	5.031	5.024	5.021	5.015
Ti	0.000	0.001	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.001
Al	3.960	4.066	4.002	3.962	4.052	4.027	3.956	3.950	3.959	3.970
Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fe	0.635	0.621	0.567	0.434	0.516	0.140	0.339	0.298	0.205	0.569
Mn	0.027	0.003	0.027	0.037	0.066	0.037	0.049	0.046	0.062	0.028
Mg	1.322	1.466	1.472	1.509	1.517	1.871	1.595	1.653	1.735	1.405
Ca	0.000	0.002	0.000	0.001	0.005	0.000	0.002	0.001	0.001	0.002
Na	0.037	0.021	0.043	0.036	0.020	0.012	0.025	0.038	0.019	0.015
K	0.002	0.002	0.001	0.000	0.002	0.001	0.009	0.000	0.000	0.001
Zn	0.001	0.001	0.000	0.001	0.002	0.000	0.000	0.007	0.003	0.002
Ni	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000
F	0.008	0.019	0.010	0.003	0.009	0.003	0.010	0.003	0.032	0.005
Cl	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.000
Total	11.02	11.10	11.08	11.01	11.09	11.04	11.02	11.02	11.04	11.01
Mg# = Mg/(Mg+Fe+Mn)*100										
	66.61	*70.15*	*71.25*	*76.23*	*72.26*	*91.37*	*80.43*	*82.76*	*86.66*	*70.19*

Table A7. (Cont.)

Sample	**KN11/39**	**KN11/40**	**KN11/41**	**KN11/42**	**KN11/43**
n	3	6	3	5	6
(%)					
SiO_2	49.91	49.56	48.62	49.07	49.35
TiO_2	0.01	0.01	0.02	0.00	0.01
Al_2O_3	33.41	33.07	32.62	32.89	33.06
Cr_2O_3	0.01	0.01	0.02	0.00	0.00
FeO	4.84	6.64	7.64	7.07	6.13
MnO	0.28	0.28	0.31	0.44	0.42
MgO	10.36	9.26	8.39	8.57	9.32
CaO	0.03	0.00	0.01	0.01	0.05
Na_2O	0.11	0.11	0.37	0.17	0.19
K_2O	0.00	0.01	0.01	0.01	0.00
ZnO	0.00	0.04	0.02	0.06	0.04
NiO	0.00	0.01	0.00	0.00	0.00
F	0.00	0.02	0.03	0.02	0.02
Cl	0.00	0.01	0.00	0.00	0.00
Total	98.99	99.01	98.06	98.32	98.60
Formula 18(O)					
Si	5.025	5.031	5.015	5.030	5.024
Ti	0.001	0.001	0.001	0.000	0.001
Al	3.964	3.956	3.966	3.974	3.967
Cr	0.000	0.000	0.000	0.000	0.000
Fe	0.407	0.564	0.659	0.606	0.522
Mn	0.024	0.024	0.027	0.038	0.036
Mg	1.555	1.401	1.291	1.310	1.414
Ca	0.003	0.000	0.001	0.001	0.006
Na	0.021	0.021	0.074	0.034	0.037
K	0.000	0.001	0.001	0.001	0.000
Zn	0.000	0.003	0.001	0.004	0.003
Ni	0.000	0.000	0.000	0.000	0.000
F	0.000	0.007	0.011	0.006	0.006
Cl	0.001	0.002	0.001	0.001	0.001
Total	11.00	11.01	11.05	11.01	11.02
Mg# = Mg/(Mg+Fe+Mn)*100					
	78.28	*70.47*	*65.30*	*67.02*	*71.68*

Table A8. Chemical composition of garnet grains near the ore zone from Areachap.

Sample	**AP5/20**	**AP5/23**	**AP5/28***	**AP5/42**	**AP5/42**	**KN11/9**	**KN11/19**	**KN11/34***
n	3	6	5	3	3	8	8	3
(%)								
SiO_2	37.68	36.22	36.62	37.00	37.21	37.19	36.72	35.00
TiO_2	0.02	0.01	0.01	0.02	0.02	0.03	0.07	0.01
Al_2O_3	20.86	23.52	21.32	19.89	19.99	20.86	21.28	23.26
Cr_2O_3	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00
FeO	24.66	30.46	35.14	24.20	24.99	30.78	34.71	10.75
MnO	12.52	6.06	0.73	13.24	11.60	5.47	2.01	19.95
MgO	3.96	3.28	5.31	1.14	1.27	3.06	2.61	8.61
CaO	0.25	0.75	0.37	3.52	4.32	1.89	1.74	0.13
Na_2O	0.01	0.01	0.02	0.04	0.03	0.02	0.02	0.05
K_2O	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.00	0.08	0.00	0.01	0.02	0.01	0.00	1.22
NiO	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.01
F	0.02	0.04	0.09	0.02	0.03	0.04	0.04	0.04
Cl	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00
Total	*99.99*	*100.45*	*99.66*	*99.10*	*99.49*	*99.37*	*99.18*	*99.02*
Formula 12(O)								
Si	3.021	2.891	2.927	3.038	3.036	3.010	2.984	2.765
Ti	0.001	0.001	0.001	0.001	0.001	0.002	0.004	0.001
Al	1.971	2.212	2.009	1.925	1.923	1.990	2.039	2.166
Cr	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000
Fe^{3+}	0.000	0.000	0.134	0.000	0.000	0.000	0.000	0.304
Fe^{2+}	1.654	2.033	2.215	1.662	1.706	2.083	2.360	0.406
Mn	0.850	0.409	0.049	0.921	0.802	0.375	0.138	1.335
Mg	0.473	0.390	0.633	0.140	0.154	0.369	0.316	1.014
Ca	0.021	0.064	0.032	0.310	0.378	0.164	0.152	0.011
Total	*7.992*	*8.002*	*8.000*	*7.998*	*8.001*	*7.99*	*7.99*	*8.000*
End-members (%)								
Almandine	*55.52*	*70.12*	*75.64*	*54.90*	*56.10*	*69.85*	*79.75*	*14.69*
Spessartine	*28.13*	*14.16*	*1.68*	*30.29*	*26.39*	*12.46*	*4.62*	*48.27*
Pyrope	*15.65*	*13.50*	*21.61*	*4.61*	*5.07*	*12.25*	*10.56*	*36.65*
Grossular	*0.71*	*2.22*	*1.01*	*10.23*	*12.43*	*5.49*	*5.13*	*0.34*
Andradite	*0.00*	*0.01*	*0.07*	*0.00*	*0.01*	*0.00*	*0.00*	*0.05*

* Calculated Fe^{3+} based on mineral stoichiometry.

Table A9. Average chemical composition of biotite grains near the ore zone from Areachap and Kantienpan.

Sample	**AP5/22***	**AP5/23***	**AP5/25***	**AP5/28***	**AP5/29***	**AP5/30***	**AP5/32***	**AP5/35***	**KN11/3***	**KN11/9***	**KN11/11***
n	3	6	7	3	7	7	8	3	36	2	14
(%)											
SiO_2	36.32	36.19	35.40	36.36	36.69	38.32	37.33	35.23	36.51	36.23	35.53
TiO_2	1.56	1.46	1.25	2.09	0.88	1.48	0.39	2.40	3.23	2.89	5.09
Al_2O_3	18.42	18.09	19.18	19.00	19.42	17.94	18.53	15.45	17.01	14.96	14.24
Cr_2O_3	0.00	0.00	0.01	0.00	0.02	0.01	0.01	0.00	0.01	0.02	0.01
FeO	18.27	16.74	19.46	19.18	16.16	12.42	13.46	25.00	16.30	20.04	22.74
MnO	0.06	0.10	0.08	0.03	0.18	0.13	0.21	0.83	0.37	0.12	0.18
MgO	11.07	12.29	10.73	11.69	13.27	15.34	15.57	6.12	13.62	11.09	9.95
CaO	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.02	0.01
Na_2O	0.41	0.63	0.47	0.46	0.47	0.42	0.44	0.13	0.08	0.12	0.10
K_2O	8.07	7.87	7.89	7.87	7.83	8.21	7.04	8.76	9.00	9.44	8.76
ZnO	0.02	0.01	0.01	0.02	0.02	0.06	0.04	0.09	0.08	0.08	0.08
NiO	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01
F	0.51	0.55	0.30	0.42	0.47	0.74	0.53	0.12	0.83	0.92	0.77
Cl	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.05	0.01	0.02	0.07
Total	*94.73*	*93.94*	*94.78*	*97.13*	*95.41*	*95.11*	*93.55*	*94.21*	*97.06*	*95.91*	*97.53*
Formula 11(O)											
Si	2.742	2.740	2.681	2.680	2.716	2.808	2.772	2.790	2.701	2.774	2.704
Ti	0.089	0.083	0.071	0.116	0.049	0.082	0.022	0.143	0.180	0.166	0.291
Al	1.639	1.614	1.712	1.651	1.694	1.549	1.621	1.442	1.482	1.350	1.277
Cr	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001
Fe^{3+}	0.115	0.106	0.123	0.118	0.100	0.076	0.084	0.166	0.101	0.128	0.145
Fe^{2+}	1.038	0.954	1.109	1.064	0.900	0.685	0.752	1.490	0.907	1.155	1.303
Mn	0.004	0.006	0.005	0.002	0.011	0.008	0.013	0.056	0.023	0.008	0.011
Mg	1.246	1.388	1.212	1.284	1.464	1.676	1.724	0.723	1.502	1.266	1.129
Ca	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.001	0.001
Na	0.060	0.092	0.069	0.066	0.067	0.059	0.063	0.020	0.011	0.017	0.015
K	0.778	0.760	0.763	0.740	0.739	0.767	0.667	0.885	0.849	0.922	0.851
Total	*7.710*	*7.743*	*7.746*	*7.723*	*7.741*	*7.711*	*7.718*	*7.716*	*7.758*	*7.789*	*7.726*
Mg/(Mg+Fe2)											
	0.55	*0.59*	*0.52*	*0.55*	*0.62*	*0.71*	*0.70*	*0.33*	*0.62*	*0.52*	*0.46*

* Calculated Fe^{3+} based on mineral stoichiometry.

Table A9. (Cont.)

Sample	**KN11/12***	**KN11/19***	**KN11/20***	**KN11/25***	**KN11/27***	**KN11/28***	**KN11/29***	**KN11/39***	**KN11/40***	**KN11/41***	**KN11/43***	**KN11/44***
n	8	14	3	8	3	5	10	4	4	3	1	4
(%)												
SiO_2	36.16	39.29	35.07	46.04	37.97	36.05	37.90	37.83	37.68	36.94	36.60	37.91
TiO_2	4.84	2.40	4.20	1.04	2.79	2.60	2.19	0.48	0.93	1.02	1.07	2.40
Al_2O_3	14.38	11.58	14.93	34.96	16.85	18.96	16.98	16.79	16.53	19.10	18.68	15.97
Cr_2O_3	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00
FeO	23.35	27.15	21.90	1.20	11.56	14.12	13.31	11.39	14.16	15.49	14.59	11.34
MnO	0.20	0.68	0.14	0.03	0.35	0.59	0.93	0.11	0.14	0.12	0.20	0.21
MgO	9.68	10.83	9.07	1.01	15.68	13.42	15.16	17.26	15.74	12.96	13.34	17.10
CaO	0.01	0.12	0.05	0.00	0.00	0.03	0.04	0.00	0.00	0.01	0.01	0.01
Na_2O	0.07	0.09	0.05	0.24	0.05	0.10	0.07	0.23	0.23	0.31	0.32	0.14
K_2O	8.58	5.60	8.49	9.63	9.56	9.32	8.46	8.55	8.91	8.47	7.94	8.84
ZnO	0.08	0.03	0.02	0.00	0.03	0.05	0.05	0.02	0.09	0.04	0.02	0.04
NiO	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01
F	0.44	0.31	0.24	0.08	1.00	0.32	1.08	1.88	1.66	0.92	1.22	1.31
Cl	0.02	0.11	0.02	0.00	0.02	0.10	0.04	0.01	0.02	0.05	0.03	0.03
Total	*97.84*	*98.20*	*94.18*	*94.24*	*95.85*	*95.66*	*96.23*	*94.53*	*96.11*	*95.44*	*94.03*	*95.30*
Formula 11(O)												
Si	2.730	2.940	2.731	3.080	2.786	2.670	2.785	2.820	2.802	2.747	2.756	2.797
Ti	0.275	0.135	0.246	0.052	0.154	0.145	0.121	0.027	0.052	0.057	0.061	0.133
Al	1.280	1.021	1.371	2.757	1.457	1.655	1.470	1.475	1.449	1.674	1.658	1.389
Cr	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fe^{3+}	0.147	0.170	0.143	0.007	0.071	0.087	0.082	0.071	0.088	0.096	0.092	0.070
Fe^{2+}	1.327	1.529	1.284	0.061	0.639	0.787	0.736	0.639	0.793	0.867	0.827	0.630
Mn	0.013	0.043	0.009	0.002	0.022	0.037	0.058	0.007	0.009	0.008	0.013	0.013
Mg	1.090	1.208	1.053	0.100	1.715	1.482	1.660	1.918	1.745	1.437	1.497	1.881
Ca	0.000	0.009	0.004	0.000	0.000	0.002	0.003	0.000	0.000	0.001	0.001	0.001
Na	0.010	0.013	0.008	0.031	0.007	0.015	0.010	0.033	0.034	0.045	0.047	0.020
K	0.826	0.535	0.843	0.822	0.895	0.880	0.793	0.813	0.845	0.803	0.763	0.832
Total	*7.699*	*7.604*	*7.692*	*6.912*	*7.746*	*7.761*	*7.719*	*7.802*	*7.817*	*7.735*	*7.713*	*7.767*
$Mg/(Mg+Fe^{2+})$												
	0.45	*0.44*	*0.45*	*0.62*	*0.73*	*0.65*	*0.69*	*0.75*	*0.69*	*0.62*	*0.64*	*0.75*

* Calculated Fe^{3+} based on mineral stoichiometry.

Table A10. Chemical composition of spinel grains from Kantienpan.

Sample	**KN11/34***	**KN11/43***	**KN11/42***	**KN12/32***	**KN12/35***
n	3	3	3	3	3
(%)					
SiO_2	0.03	0.23	0.21	0.42	0.02
TiO_2	0.01	0.01	0.01	0.01	0.02
Al_2O_3	59.02	56.31	56.12	56.39	59.94
Cr_2O_3	0.01	0.01	0.01	0.01	0.01
FeO	5.39	12.04	13.71	9.50	16.60
MnO	0.46	0.23	0.23	0.22	0.39
MgO	6.26	2.47	2.30	4.28	8.56
CaO	0.00	0.01	0.00	0.01	0.00
Na_2O	0.66	0.69	0.63	0.63	0.31
K2O	0.00	0.00	0.01	0.00	0.01
ZnO	29.39	28.69	26.43	27.94	14.10
NiO	0.01	0.01	0.00	0.00	0.00
F	0.01	0.01	0.06	0.02	0.00
Cl	0.01	0.01	0.00	0.00	0.01
Total	*101.27*	*100.71*	*99.72*	*99.42*	*99.96*
Formula 32(O)					
Si	0.008	0.068	0.063	0.126	0.005
Ti	0.002	0.002	0.001	0.002	0.003
Al	15.352	15.177	15.277	15.162	15.468
Cr	0.002	0.002	0.002	0.001	0.002
Fe^{3+}	0.626	0.682	0.592	0.582	0.514
Fe^{2+}	0.368	1.621	2.056	1.230	2.525
Mn	0.087	0.045	0.044	0.043	0.072
Mg	2.060	0.843	0.792	1.455	2.796
Ca	0.001	0.002	0.001	0.002	0.000
Zn	5.494	5.558	5.171	5.399	2.616
Ni	0.001	0.001	0.001	0.000	0.000
Total	*24.000*	*24.000*	*24.000*	*24.000*	*24.000*

* Calculated Fe^{3+} based on mineral stoichiometry.