

APPENDIX 6: MICROPROBE ANALYSES OF AMPHIBOLES

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIPOLES IN CAYMAN TROUGH PLUTONICS

PAGE 1

ANALYSIS	611-1-1	611-1-1	611-1-1	611-1-1	611-1-1	611-1-1	611-1-1
	A-1	A-2	B-3	B-4	B-5	B-6	B-7-1-1
SiO2	49.03	46.54	44.91	45.19	44.54	46.39	45.87
Al2O3	9.07	11.37	14.11	13.34	12.03	12.96	9.60
FeO	7.03	6.89	6.21	7.31	7.01	6.16	7.87
Fe2O3	.55	1.15	1.94	.27	.50	1.18	.50
CaO	18.12	17.21	17.15	16.72	16.09	17.57	16.27
MgO	.10	.10	.13	.08	.11	.15	.11
TiO2	1.17	1.09	.54	1.42	2.64	.69	2.35
CaO	12.48	12.13	11.28	11.98	11.82	11.82	12.21
Na2O	1.62	1.93	2.16	2.16	2.22	2.09	1.68
K2O	.24	.36	.25	.44	.42	.24	.60
TOTAL	99.44	96.77	98.50	98.91	98.88	99.15	96.46

NO. OF IONS/23 OXYGENS

Si	6.8519	6.5788	6.3436	6.3876	6.3248	6.4982	6.6584
Al4	1.1461	1.4212	1.6584	1.6124	1.6752	1.5018	1.3816
Alc	.3462	.4736	.6932	.6107	.4392	.6219	.3013
Fe2	.8187	.8143	.7174	.8641	.9275	.7218	.9557
Fe3	.0579	.1220	.2084	.0285	.0000	.1240	.0544
Mg	3.7739	3.6256	3.6102	3.5222	3.5321	3.6679	3.5197
Mn	.0119	.0120	.0156	.0096	.0132	.0178	.0135
Ti	.1332	.1159	.0574	.1510	.2819	.0727	.2565
Ca	1.8688	1.8373	1.7072	1.8145	1.7985	1.7741	1.8991
Na	.4532	.5290	.5971	.5920	.6113	.5676	.4728
K	.0428	.0649	.0451	.0793	.0761	.0429	.0000

QUADRILATERAL

COMPONENT	15.50	15.59	15.64	15.67	15.68	15.61	15.47
40	28.92	29.27	28.32	29.26	28.74	28.78	29.79
EN	58.41	57.76	59.89	56.80	56.44	59.51	55.22
F5	12.67	12.97	11.78	13.93	14.82	11.71	14.99
A-SITE	30.25	29.47	27.94	29.40	28.77	28.90	26.06
MAP4	.00	.00	.00	.00	.00	.00	.00
AL4	69.75	70.53	72.06	70.60	70.51	71.10	73.94

APPENDIX D. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS

PAGE 2

ANALYSIS 611-3-1C 611-3-1C 611-3-1C 611-3-1C 611-3-1C 611-3-1C 611-3-1C

	2-1	3-2	3-3	1-7	1-8	1-9	1-10
SiO2	48.16	50.68	51.61	50.78	48.78	49.57	49.48
Al2O3	4.38	3.80	5.64	5.64	7.61	6.67	6.88
FeO	13.09	14.34	15.99	12.36	12.99	11.87	11.64
Fe2O3	.00	.00	.00	.00	.00	.00	.00
MgO	14.85	16.80	15.77	15.56	14.91	15.32	15.23
MnO	.14	.32	.33	.15	.11	.17	.11
TiO2	1.59	.31	.49	.80	.83	.80	.77
CaO	11.51	8.04	8.24	11.79	12.11	11.54	12.14
Na2O	1.46	1.13	.95	1.24	1.50	1.45	1.46
K2O	.27	.06	.18	.11	.12	.11	.12

TOTAL 97.85 96.06 97.28 98.12 98.06 97.50 97.83

NO. OF IONS/23 OXYGENS

Si	7.0221	7.4424	7.5289	7.3074	7.0475	7.1758	7.1435
Al4	.9779	.5576	.4711	.6926	.5925	.8242	.8565
Al6	.182	.2037	.1824	.2642	.3141	.3141	.3145
Fe2	1.5926	1.7612	1.9568	1.4875	1.4608	1.4371	1.4054
Fe3	.0000	.0030	.0000	.0000	.0000	.0000	.0000
Mg	3.2256	3.6768	3.4206	3.3370	3.2103	3.3052	3.2769
Mn	.0173	.0396	.0406	.0183	.0135	.0208	.0135
Ti	.1743	.3342	.3560	.5530	.3922	.0871	.0836
Ca	1.7975	1.2651	1.2860	1.8179	1.8747	1.7900	1.8780
Na	.4182	.3218	.2667	.3459	.4202	.4070	.4087
K	.0502	.0112	.0149	.0202	.0221	.0203	.0221

QUADRILATERAL COMPONENT

SiO2	15.46	15.31	15.23	15.34	15.44	15.38	15.40
AlO3	27.16	18.87	19.32	27.37	28.64	27.40	28.63
FeO	48.73	54.85	51.42	50.24	49.04	50.60	49.95
Fe2O3	24.11	26.27	29.26	22.39	22.32	22.00	21.42

A-SITE	31.72	34.89	30.50	32.51	31.22	30.49	31.29
B-SITE	.67	2.50	7.38	2.07	.49	3.65	2.18
AL4	67.01	62.61	62.42	65.41	60.29	65.46	66.53

APPENDIX D. MICROPROBE ANALYSES OF AMPHIFILES IN CAYMAN TROUGH PLUTONICS.

PAGE 3

ANALYSIS 61-3-10 611-4-IMP 611-5-1 611-5-1 611-5-1 611-5-1

	176	5	11	2	6	9	13
SiO2	51.14	47.81	46.22	44.20	43.27	44.75	43.84
Al2O3	6.55	4.97	4.99	11.41	10.76	10.77	10.16
FeO	11.52	14.29	15.23	6.11	10.26	9.74	8.63
Fe2O3	.22	2.74	1.61	.00	.00	.00	.00
P2O5	17.11	13.71	13.09	15.14	14.85	15.54	16.17
MnO	.19	.22	.03	.03	.06	.06	.07
TiO2	.28	.95	1.02	2.52	3.15	3.22	2.22
CaO	10.84	10.82	11.25	11.71	11.57	11.53	11.20
MgO	1.26	1.20	1.13	2.54	2.63	2.78	2.71
K2O	.12	.01	.00	.21	.27	.29	.22
TOTAL	98.71	96.72	96.94	95.87	96.82	98.68	95.42

NO. OF IONS/23 OXYGENS

SI	7.2682	7.1286	7.1827	6.4800	6.3719	6.4336	6.4928
AL	.7316	.8714	.9173	1.5220	1.5261	1.5664	1.5012
FE	.2619	.3023	.3590	.4521	.2399	.2591	.2668
FE2	1.3697	1.7815	1.8969	.9984	1.2636	1.1711	1.0937
FE3	.0210	.3072	.2034	.0000	.0000	.0000	.0000
MG	3.6241	3.5465	2.9059	3.3030	3.2590	3.3296	3.5691
MN	.0229	.0278	.0252	.0037	.0075	.0073	.0068
TI	.0299	.1065	.1142	.2778	.3489	.3482	.2473
CA	1.6556	1.7287	1.7956	1.0395	1.8256	1.7762	1.7774
MA	.3472	.3469	.3264	.7220	.7510	.7750	.7782
K	.0218	.0019	.0000	.0393	.0507	.0532	.0416
QUADRILATERAL COMPONENT	15.37	15.35	15.33	15.64	15.75	15.72	15.78

QUADRILATERAL COMPONENT

NO	24.04	26.36	27.21	29.95	28.76	28.30	27.60
EN	54.54	46.46	44.24	53.86	51.34	53.05	55.42
FS	20.61	27.37	28.75	16.19	19.97	18.66	16.98
A-SITE	33.52	28.59	28.54	27.91	30.71	30.05	33.64
NAP4	.00	.00	.00	5.46	2.69	4.53	1.59
AL4	66.48	71.41	71.46	66.63	67.01	65.42	64.77

APPENDIX 6. MICROPROBE ANALYSIS OF AMPHIPOLES IN CAYMAN TROUGH PLUTONICS
PAGE 4

ANALYSIS	611-5-1	611-5-1	611-5-2A	611-5-2A	611-5-2A	611-5-2A	611-5-2A
SiO2	16	17	4	8	16	20	
Al2O3	43.90	43.78	43.77	41.35	43.04	42.47	
FeO	11.56	11.33	11.61	10.96	11.18	10.45	
Fe2O3	9.16	9.03	8.51	8.81	10.24	9.97	
MgO	15.39	15.86	15.79	15.45	14.92	14.94	
TiO2	0.9	0.36	0.22	0.00	0.14	0.10	
CaO	11.86	11.78	12.19	11.16	12.27	12.38	
Na2O	2.51	2.68	2.67	2.68	2.70	2.93	
K2O	0.29	0.26	0.21	0.25	0.41	0.23	
TOTAL	96.67	97.71	97.33	96.88	93.72	98.09	97.11

NO. OF ICNS/23 OXYGENS

SI	6.4261	6.3509	6.3593	6.3764	6.2563	6.2815	6.2682
AL4	1.5739	1.6491	1.8407	1.6236	1.7417	1.7185	1.7318
AL6	0.4211	0.2373	0.2859	0.3704	0.2139	0.2051	0.0865
FE2	1.1214	1.0955	1.1667	1.0368	1.1151	1.2499	1.2306
FE3	0.0000	0.0000	0.0000	0.0037	0.0000	0.0000	0.0000
M6	3.3574	3.4288	3.3665	3.4282	3.4849	3.2452	3.2862
M4	0.012	0.074	0.025	0.0000	0.0000	0.0173	0.0125
TI	0.2114	0.3524	0.3128	0.2586	0.3711	0.3501	0.4040
CA	1.8602	1.8311	1.8122	1.9028	1.8098	1.9188	1.9378
NA	0.7124	0.7538	0.8121	0.7175	0.7805	0.7640	0.8385
K	0.0523	0.0491	0.0391	0.0149	0.0097	0.0763	0.0433

QUADRILATERAL COMPONENT

WJ	29.35	28.81	28.56	29.88	28.24	29.92	30.24
EN	52.96	53.95	53.55	53.94	54.37	50.60	50.75
FS	17.69	17.24	18.39	16.28	17.40	19.49	19.01
A-SITE	31.96	35.78	31.81	31.59	31.17	32.31	32.89
AM4	0.74	1.94	2.35	0.20	0.20	0.53	0.85
AL4	67.31	67.28	65.84	68.91	68.63	67.16	66.26
QUADRILATERAL COMPONENT	15.75	15.75	15.79	15.73	15.79	15.83	15.86

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CATMAN TROUGH PLUTONICS
PAGE 5

ANALYSIS	611-6-1	611-6-1	611-6-1	611-6-1	611-6-1	611-6-1	611-6-1
SiO2	52.08	44.76	54.16	44.57	44.46	49.08	45.30
Al2O3	6.55	13.89	3.76	12.11	13.30	12.33	13.33
FeO	6.24	5.94	4.30	6.45	7.18	6.36	5.49
Fe2O3	2.51	1.35	.00	.34	.00	.00	1.25
MgO	19.61	17.10	21.08	17.01	16.11	17.11	17.60
MnO	.16	.07	.09	.12	.13	.12	.09
TiO2	.16	.24	.14	2.13	2.03	2.39	.53
CaO	11.19	12.01	12.31	11.91	11.91	11.78	11.57
Na2O	.72	2.44	.64	2.30	2.19	2.32	2.20
K2O	.13	2.26	.95	.40	.44	.43	.25
TOTAL	98.85	98.06	96.57	97.04	97.95	96.92	97.65

NO. OF IONS/23 OXYGENS

Si	7.2337	6.3541	7.3893	6.4091	6.3461	6.3514	6.4320
Al4	.7683	1.6459	.4107	1.5909	1.6539	1.6486	1.5680
Al6	.3062	.6787	.2105	.4621	.6178	.4459	.6633
Fe2	.7242	.6457	.5039	.7759	.8571	.7664	.6517
Fe3	.2297	.1972	.3000	.0371	.0000	.0000	.1333
P5	4.0593	3.6178	4.4023	3.6454	3.4270	3.6742	3.7243
M4	.0168	.0084	.0107	.0146	.0157	.0146	.0108
Ti	.0197	.0256	.0148	.2304	.2179	.2390	.0566
Ca	1.6654	1.8268	1.8403	1.8351	1.8215	1.8187	1.7603
Na	.1739	.6716	.1739	.5576	.001	.6481	.6057
K	.0230	.0471	.0101	.0734	.0801	.0790	.0525
SUBTOTAL	15.22	15.72	15.16	15.63	15.64	15.71	15.66

SiO2	25.82	30.00	27.36	29.33	29.03	29.06	28.69
Al2O3	62.95	59.40	65.18	58.27	56.13	58.70	60.69
FeO	11.23	10.60	7.46	12.40	14.04	12.24	10.62
TOTAL	22.06	30.39	30.03	28.40	27.49	29.72	29.57
NaM4	.00	.00	1.60	.00	1.84	.89	.00
Al4	77.94	69.61	64.37	71.60	70.62	69.39	76.43

APPENDIX 9. MICROPROBE ANALYSES OF AMPHIPHILES IN CAYMAN TROUGH PLUTONICS
PAGE 6

ANALYSIS	611-6-1	611-6-1	611-6-1	612-3-1A	612-3-1A	612-3-1A	612-3-1A	612-3-1A
	2-10	2-11	2-12	4-1	4-2	4-3	4-4	5-4
SiO2	43.65	43.99	43.72	55.08	50.46	48.58	46.19	
Al2O3	12.35	12.39	11.91	5.64	5.64	9.02	7.91	
FeO	6.69	6.74	6.61	6.48	9.54	10.19	15.30	
Fe2O3	0.00	0.00	0.00	0.37	0.78	1.22	2.29	
MgO	16.65	16.60	16.66	20.31	16.54	15.55	11.52	
MnO	.11	.13	.10	.19	.15	.22	.24	
TiO2	3.93	3.56	3.76	.11	.15	.29	.16	
CaO	11.76	11.82	11.71	12.38	12.34	12.36	11.69	
Na2O	2.52	2.42	2.50	.50	1.09	1.67	1.51	
K2O	.43	.41	.38	.08	.19	.11	.10	
TOTAL	97.99	98.06	97.55	97.42	96.92	99.19	96.91	

NO. OF IONS/23 OXYGENS

Si	6.2465	6.2841	6.2856	7.7344	7.2908	6.9071	6.9245
Al4	1.7535	1.7159	1.7144	.2656	.7092	1.0929	1.0755
Al6	.3301	.3708	.3042	.0523	.2515	.4196	.3225
Fe2	.8017	.8052	.8138	.7614	1.1575	1.2123	1.9189
Fe3	.0000	.0000	.0000	.0396	.0847	.1308	.2588
Pu	3.5510	3.5341	3.5696	4.2504	3.5616	3.2963	2.5738
Mn	.0133	.0157	.0122	.0226	.0184	.0265	.0305
Ti	.4122	.3825	.4065	.0116	.0163	.0310	.0160
Ca	1.8033	1.8093	1.8039	1.8627	1.9135	1.8838	1.6778
Na	.6992	.6703	.6969	.1361	.3154	.4606	.4389
K	.0765	.0747	.0697	.0143	.0350	.0200	.0191

QUADRILATERAL COMPONENT

SiO2	29.30	29.43	29.13	27.10	26.82	29.47	29.48
Al2O3	57.48	57.48	57.65	61.83	53.72	51.57	40.40
FeO	13.01	13.10	13.22	11.08	17.46	18.96	30.12
Fe2O3	27.19	26.93	27.48	36.17	32.43	30.54	29.87
Al4	3.53	2.35	3.42	.00	.00	.00	.00
Al6	69.27	69.73	69.40	63.83	67.57	69.46	70.13
TOTAL	15.69	15.66	15.68	15.15	15.34	15.48	15.46

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIPHILES IN CAYMAN TROUGH PLUTONICS
PAGE 7

ANALYSIS	62-3-1A	62-3-1A	62-3-1A	62-3-1A	62-3-1A	62-3-1A	62-3-1A	62-3-1A	62-3-1A
SI02	5-5	5-6	1-1	1-2	1-3	1-4	2-5		
AL2O3	47.69	44.30	47.31	50.02	52.01	45.93	52.98		
FeO	7.11	11.36	6.46	4.76	2.95	7.60	1.85		
Fe2O3	16.03	8.35	16.79	14.68	12.88	17.34	14.49		
P2O5	1.22	1.10	.00	.32	.74	.00	1.04		
MgO	11.56	15.44	12.41	14.17	15.44	11.28	16.06		
MnO	.24	.10	.35	.32	.27	.38	.55		
TiO2	.23	3.74	1.45	.74	.31	1.66	.16		
CaO	12.14	11.99	10.75	11.58	11.90	10.74	9.99		
Na2O	1.26	2.24	2.13	1.11	.65	2.38	.47		
K2O	.15	.30	.39	.14	.10	.31	.07		
TOTAL	97.50	97.52	97.74	97.84	97.25	97.62	97.66		

NO. OF IONS/23 OXYGENS

SI	7.0901	6.3646	7.0078	7.3199	7.5713	6.8845	7.6947
AL4	.9099	1.6354	.8801	.8201	.4287	1.1155	.3053
AL6	.3363	.3019	.1430	.1411	.0776	.2275	.0115
Fe2	1.9925	1.0101	2.0932	1.7971	1.5684	2.1737	1.7595
Fe3	.1362	.0000	.0000	.0351	.0813	.0000	.1135
Mg	2.5613	3.3285	2.7570	3.0904	3.3497	2.5198	3.4762
Mn	.0302	.0123	.0442	.0397	.0333	.0482	.0677
Ti	.0237	.4599	.1626	.0814	.0339	.1871	.0175
Ca	1.9160	1.8584	1.7171	1.8158	1.8502	1.7249	1.5547
Na	.3632	.6282	.6157	.3150	.1835	.6917	.1324
K	.0229	.0554	.0742	.0261	.0186	.0593	.0130

QUADRILATERAL COMPONENT

SiO2	15.39	15.60	15.61	15.34	15.27	15.63	15.15
Al2O3	29.64	29.99	26.15	27.09	27.40	26.87	22.90
FeO	39.58	53.71	41.98	46.10	44.45	39.26	51.19
Fe2O3	30.79	16.39	31.57	28.81	23.15	33.87	25.91
A-SITE	29.79	25.95	26.66	33.40	32.03	33.88	32.25
NaF4	.00	3.53	4.93	.70	.00	6.36	.00
AL4	7.621	7.052	58.99	66.60	67.97	59.76	67.75

APPENDIX D. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS

PAGE 6

ANALYSIS	613-1-1	613-1-1	613-1-1	613-1-1	613-2-1	613-2-1
SiO ₂	52.00	48.63	3-8	3-9	3-10	3-7
Al ₂ O ₃	2.43	5.33	3.03	50.34	47.72	48.64
FeO	16.77	14.66	22.06	14.92	17.29	7.22
Fe ₂ O ₃	.06	.91	.00	.00	.02	14.52
MgO	15.35	14.04	17.30	14.48	12.08	13.86
MnO	.03	.44	1.42	.47	.43	.32
TiO ₂	.31	.34	.66	.55	1.12	1.96
CaO	9.30	10.70	.97	10.66	10.68	12.30
Na ₂ O	.56	1.40	.24	1.13	1.55	1.65
K ₂ O	.09	.11	.03	.13	.47	.38
TOTAL	97.92	96.55	96.30	96.54	97.27	100.27
						99.15

NO. OF OXS/23 OXYGENS

Si	7.7007	7.2319	7.9724	7.4511	7.1823	6.9096	6.4610
Al _{IV}	.2993	.7661	.2276	.5489	.8577	1.0904	1.5390
Al _{VI}	.0496	.1663	.0057	.1246	.1710	.1338	.2657
Fe ₂	2.0442	1.8228	4.3172	1.8469	2.1842	1.7463	1.2718
Fe ₃	.0067	.1012	.0000	.0000	.0000	.0027	.0000
Mg	3.3352	3.1117	3.0327	3.1941	2.6945	2.9709	3.1618
Mn	.0778	.6554	.1768	.0589	.0545	.0390	.0244
Ti	.0340	.0340	.0000	.0612	.1201	.2120	.3329
Ca	1.4545	1.7050	1.1545	1.6977	1.7124	1.8956	1.8697
Na	.1563	.4037	.0116	.3243	.5309	.4601	.7107
K	.0167	.0309	.0057	.0245	.0516	.0697	.0440
QUADRILATERAL COMPONENT	15.13	15.42	15.01	15.33	15.51	15.53	15.68
W	21.26	25.68	24.27	25.11	26.56	28.67	29.66
EN	48.02	46.97	50.33	47.45	41.00	44.93	50.16
FS	29.92	27.45	41.40	27.40	32.93	26.41	20.18
A-SITE	36.90	35.60	28.69	36.24	35.37	32.70	29.69
MA ₂	.00	.00	9.73	2.62	5.32	.00	3.21
AL ₄	67.4	64.4	64.59	61.14	59.51	67.30	67.10

APPENDIX e. MICROPROBE ANALYSES OF AMPHIPOLES IN CAYMAN TROUGH PLUTONICS.

PAGE 9

ANALYSIS	613-2-1	613-2-1	613-2-1	613-2-1	613-2-1	613-2-1	613-2-1
	15	19	21	1-2	1-1	1-2	1-4
SiO2	44.55	48.78	47.67	46.58	45.36	43.01	53.87
Al2O3	11.15	6.23	4.63	10.32	11.72	13.25	4.01
FeO	12.56	15.49	16.42	7.39	6.63	9.03	5.15
Fe2O3	.06	.00	.00	2.54	1.54	.53	.26
MgO	13.57	14.25	13.54	16.50	15.79	15.08	20.47
MnO	.24	.37	.41	.11	.12	.12	.28
TiO2	1.73	1.69	1.19	.55	.70	1.96	.16
CaO	11.53	10.51	11.34	12.24	11.87	11.59	12.63
Na2O	2.22	1.73	1.26	1.80	2.18	2.34	.78
K2O	.49	.28	.26	.39	.33	.31	.05
TOTAL	97.66	99.33	99.10	98.42	98.24	97.22	97.48

NO. OF IONS/23 OXYGENS

Si	6.5184	7.0677	7.2664	6.6510	6.5151	6.2605	7.5280
Al	1.4816	.9323	.7336	1.3490	1.4849	1.7395	.4720
Al6	.4504	.1319	.6961	.3863	.4997	.5342	.1887
Fe2	1.5463	1.8770	1.9985	.8827	1.0372	1.0996	.6017
Fe3	.0000	.0000	.0000	.2732	.1664	.0561	.0294
Mg	2.9266	3.0770	2.9402	3.5112	3.3800	3.2713	4.2632
Mn	.0299	.0454	.0506	.0133	.0146	.0148	.0095
Ti	.1912	.1842	.1304	.0591	.0756	.2146	.0168
Ca	1.8158	1.6317	1.7765	1.8727	1.8208	1.8077	1.8912
Na	.6326	.4862	.3560	.4983	.6071	.6604	.2113
K	.0919	.0518	.0463	.0710	.0605	.0576	.0089

QUADRILATERAL

COMPONENT	15.69	15.48	15.59	15.57	15.67	15.72	15.22
SiO	28.66	24.78	26.39	29.88	29.26	29.26	27.99
Al	46.55	46.72	43.62	56.03	54.13	52.95	63.10
Fe	24.58	28.50	29.79	14.09	16.61	17.80	8.91

A-SITE	31.12	32.99	24.32	29.68	31.01	29.22	31.82
MAP8	1.72	3.59	1.21	.10	.00	.00	.00
AL4	67.16	62.42	64.47	70.32	68.99	70.78	68.18

APPENDIX B. MICROPROBE ANALYSES OF AMPHIPHILES IN CAYMAN TROUGH PLUTONICS
PAGE 13

ANALYSIS	614-2-1	614-2-1	614-2-1	614-2-1	614-2-1	614-2-1
	2-1	2-2	2-3	2-4	1-1	1-2
SiC2	43.61	49.20	46.99	46.70	48.62	50.35
AL2O3	10.63	6.71	9.28	8.99	7.60	5.05
FeO	13.53	9.17	10.13	9.65	9.50	12.37
Fe2O3	.CC	.50	1.10	2.11	1.34	.CC
H2O	12.55	16.20	15.17	15.72	15.91	15.44
MNC	.22	.28	.06	.15	.11	.26
TiC2	3.15	.73	1.69	.84	.85	1.25
CaO	11.05	12.64	12.65	12.45	12.56	11.52
Na2O	2.32	1.26	1.87	1.68	1.00	1.12
K2O	.30	.10	.17	.15	.13	.16
TOTAL	97.96	96.59	98.53	97.29	98.62	97.52
						98.41

NO. OF IONS/23 OXYGENS

SI	6.4342	7.1333	6.7594	6.8070	6.9609	7.3009	7.2310
AL4	1.5658	.8667	1.2906	1.1930	1.0391	.6991	.7690
AL6	.2831	.2802	.3332	.2745	.2436	.1641	.2888
FE2	1.6695	1.1120	1.2190	1.1764	1.1857	1.5001	1.8623
FE3	.0000	.0545	.1188	.2316	.1445	.0000	.0000
H2	2.7552	3.5024	3.2522	3.2628	3.3947	3.3366	3.2092
MN	.0275	.0098	.0097	.0185	.0133	.0319	.0219
TI	.3455	.0796	.1179	.0921	.0915	.1363	.1231
CA	1.8417	1.9637	1.9446	1.9445	1.9268	1.7899	1.8167
NA	.6579	.3542	.5216	.4748	.4442	.3189	.3479
K	.0640	.0185	.0312	.0279	.0237	.0296	.0421
QUADRILATERAL COMPONENT	15.65	15.37	15.55	15.50	15.47	15.30	15.31
MO	29.37	29.86	30.37	30.46	29.61	27.01	28.00
EN	44.01	53.23	50.05	51.11	52.17	50.35	49.46
FS	26.62	16.91	18.98	18.43	18.42	22.64	22.54
A-SITE	28.53	30.07	30.82	29.65	31.05	29.07	26.92
NAH4	.00	.00	.00	.00	.00	.00	.00
AL4	68.44	65.93	69.16	70.35	68.95	66.99	66.35

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIPOLES IN CAYMAN TROUGH PLUTONICS
PAGE 11

ANALYSIS	614-2-1	614-2-1	614-2-1	614-2-1	614-2-1	614-2-1	614-2-1
	3-8	3-9	3-10	3-11	PT1	PT63	PT14
SiO2	58.66	46.84	56.64	46.47	51.14	52.56	47.61
Al2O3	1.95	7.60	.55	9.48	5.02	5.31	8.49
FeO	5.77	9.28	4.47	9.74	6.09	5.59	10.50
Fe2O3	.57	.20	.00	.26	2.28	3.49	.00
H2O	21.03	15.88	21.52	16.71	18.99	20.08	16.65
MgO	.15	.10	.09	.26	.08	.76	.12
TiO2	.01	.08	.00	.21	.92	.67	2.06
CaO	12.17	11.96	12.50	11.99	12.37	12.63	11.97
Na2O	.40	1.16	.17	1.63	1.32	1.27	2.12
K2O	.04	.07	.02	.08	.00	.00	.00
TOTAL	97.77	95.99	96.36	97.93	99.61	101.66	98.92

NO. OF IONS/23 OXYGENS

Si	7.7516	7.2206	7.9232	6.9310	7.1276	7.1586	6.8007
Al4	.2484	.7794	.0798	1.0600	.8728	.8414	1.1993
Al6	.0717	.5187	.0799	.5292	.0839	.0112	.2305
Fe2	.6716	1.1244	.5230	1.1642	.7799	.6369	1.2544
Fe3	.0196	.0000	.0000	.0281	.2389	.3575	.0000
H0	4.3633	3.4287	4.4865	3.4119	3.9445	4.0758	3.4164
Mn	.0177	.0123	.0107	.0073	.0094	.0069	.0145
Ti	.0010	.0007	.0000	.0226	.0004	.0686	.2213
Ca	1.8154	1.8566	1.8736	1.8371	1.8473	1.8432	1.8321
Na	.1300	.3315	.0461	.4519	.3507	.3354	.5872
K	.0071	.0129	.0036	.0146	.0000	.0000	.0000

QUADRILATERAL COMPONENT

QUADRILATERAL COMPONENT	15.12	15.29	15.02	15.47	15.16	15.34	15.56
Al	26.50	28.97	27.22	28.65	28.11	28.12	28.17
Fe	63.69	53.09	65.18	53.20	60.02	62.17	52.54
FS	9.80	17.54	7.80	18.15	11.07	9.71	19.29
A-SITE	31.66	26.15	16.41	30.38	29.02	28.50	31.16
RAM4	.00	0.50	20.68	.00	.00	.00	1.71
AL4	68.34	69.35	60.71	69.62	70.99	71.50	67.13

APPENDIX 00. MICROPROBE ANALYSES OF AMPHIROLES IN CAYMAN TROUGH PLUTONICS

PAGE 14

ANALYSIS	614-2-1	615-1-1	615-1-1	615-1-1	615-1-1	615-1-1	615-1-1
		3-2	3-3	3-4	3-5	3-6	
SiO2	44.79	47.40	44.08	44.38	43.83	43.67	
Al2O3	15.53	9.41	11.34	11.10	12.55	11.62	
FeO	12.67	9.98	9.51	8.67	8.45	8.38	
Fe2O3	0.00	1.10	0.00	0.00	0.00	0.00	
MgO	13.76	15.98	14.83	15.39	15.07	15.16	
MnO	0.18	0.14	0.12	0.17	0.12	0.16	
TiO2	3.28	3.37	3.67	3.58	4.34	4.55	
CaO	11.50	12.10	12.34	12.21	12.00	12.08	
Na2O	2.43	2.04	2.38	2.38	2.76	2.72	
K2O	0.00	0.43	0.35	0.37	0.36	0.31	
TOTAL	98.54	99.00	98.62	98.15	99.48	98.65	

NO. OF IONS/23 OXYGENS

Si	6.4968	6.7856	6.6448	6.3663	6.4016	6.2315	6.2678
Al4	1.5214	1.2144	1.3552	1.6337	1.5984	1.7685	1.7322
Al6	0.2574	0.3720	0.5114	0.2972	0.2892	0.3351	0.2340
Fe2	1.4642	1.1933	1.1263	1.0919	1.0700	1.0087	1.0059
Fe3	0.0000	0.1187	0.1007	0.0000	0.0000	0.0000	0.0000
M3	2.9745	3.4057	3.3755	3.1921	3.2439	3.1931	3.2428
Mn	0.021	0.170	0.157	0.147	0.204	0.145	0.195
Ti	0.3578	0.398	0.312	0.3986	0.3804	0.4911	0.4911
Ca	1.7873	1.6541	1.6297	1.4097	1.4882	1.8281	1.8578
Na	0.6334	0.5656	0.6664	0.6657	0.6657	0.7608	0.7569
K	0.0000	0.2785	0.2632	0.2645	0.2601	0.2653	0.2568

QUADRILATERAL COMPONENT

QUADRILATERAL COMPONENT	15.59	15.64	15.68	15.64	15.63	15.67	15.66
W	28.71	26.73	28.65	30.83	30.43	30.34	30.42
EN	47.78	52.78	53.23	51.54	52.31	52.99	53.10
FS	23.52	18.49	17.92	17.63	17.26	16.67	16.47
A-SITE	26.84	34.66	33.44	27.09	27.15	25.66	26.38
AP4	4.42	0.00	0.00	3.92	4.31	6.18	5.59
AL4	66.75	65.34	66.56	69.59	68.54	68.16	68.64

APPENDIX B. MICROPROBE ANALYSES OF AMPHIBOLES IN GAYMAN TROUGH PLUTONICS
PAGE 13

ANALYSIS	615-2-1	615-2-1	615-2-1	615-2-1	615-4-1	615-4-1
	4	13	16	17	3-4	3-2
SiO2	43.96	43.81	43.68	42.58	43.18	48.51
Al2O3	17.92	11.64	11.61	11.42	13.43	8.61
FeO	6.84	6.20	6.93	6.79	9.40	6.71
Fe2O3	.61	.95	.80	.86	.00	1.50
MgO	16.97	17.48	16.36	16.42	14.72	18.03
MnO	.24	.07	.10	.05	.15	.17
TiO2	2.66	2.78	2.97	2.79	2.29	.12
CaO	12.23	12.30	11.90	12.05	11.99	11.62
Na2O	2.42	2.40	2.72	2.52	2.49	1.73
K2O	.64	.25	.25	.23	.39	.09
TOTAL	97.04	97.54	96.52	94.91	98.04	97.09

NO. OF IONS/23 OXYGENS

Si	6.3596	6.3793	6.3016	6.3517	6.3354	6.2465	6.9330
Al4	1.6404	1.6207	1.6982	1.6483	1.6946	1.7535	1.0670
Al6	.2263	.2018	.3258	.3421	.2991	.5370	.3837
Fe2	.6255	.7454	.8746	.8428	.8414	1.1373	.8016
Fe3	.0668	.1025	.0050	.0000	.0070	.0000	.1618
Fe	2.6038	3.7463	3.5822	3.5455	3.6234	3.1736	3.6403
Mg	.0049	.0085	.0122	.0123	.0083	.0184	.0266
Ti	.3116	.3077	.3646	.3248	.3107	.2491	.0129
Ca	1.8954	1.8953	1.8634	1.8542	1.9120	1.8585	1.7795
Na	.6797	.6692	.7057	.7670	.7236	.6984	.4794
K	.0444	.0459	.0422	.0464	.0435	.0720	.0164
QUADRILATERAL COMPONENT	15.72	15.72	15.72	15.74	15.77	15.74	15.50

NO	29.71	29.67	29.48	29.70	29.98	30.13	27.71
EN	57.33	58.66	56.68	56.80	56.62	51.44	59.81
FS	12.96	11.67	13.84	13.50	13.19	18.43	12.48
A-SITE	30.62	30.61	29.46	29.86	31.16	29.49	31.72
AP4	.00	.00	1.11	3.18	.00	1.03	.00
AL4	69.28	65.39	69.43	60.90	60.04	69.47	68.26

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 14

ANALYSIS	615-4-1	615-4-1	615-4-1	615-5-1	615-5-1	615-5-1
SI02	51.96	50.22	43.51	49.96	47.22	49.11
AL2O3	4.72	7.00	11.90	5.58	7.85	6.98
FeO	12.76	7.33	9.27	12.15	10.91	10.21
Fe2O3	.00	.00	.00	.00	.00	.00
MgO	16.20	16.40	16.05	15.36	15.41	16.77
MnO	.45	.13	.17	.15	.08	.10
TiO2	.24	1.14	.09	3.97	2.05	1.30
CaO	10.61	12.23	10.77	11.93	11.43	11.75
Na2O	.68	1.41	2.44	2.73	1.95	2.14
K2O	.05	.25	.33	.17	.15	.11
TOTAL	98.00	97.91	98.29	97.87	98.11	97.68
						98.47

NO. OF IONS/23 OXYGENS

SI	7.4596	7.0994	6.6069	6.2868	7.2133	6.8561	7.0214
AL4	.5404	.9006	1.3931	1.7132	.7807	1.1439	.9786
AL6	.2582	.2660	.6412	.3139	.1631	.1998	.1979
FE2	1.5339	.8686	1.1032	1.0018	1.4671	1.3248	1.2208
FE3	.0000	.0000	.0000	.0000	.0000	.0000	.0000
M6	3.4640	3.8765	3.5306	3.2430	3.3890	3.3345	3.5733
MN	.0547	.0156	.0205	.0184	.0147	.0098	.0121
TI	.0256	.1212	.3097	.4314	.1151	.2239	.1398
CA	1.6315	1.8525	1.6457	1.8470	1.7590	1.7782	1.8000
NA	.2449	.3865	.6747	.7649	.5459	.7264	.5933
K	.0092	.0090	.0182	.0608	.0313	.0278	.0201

QUADRILATERAL COMPONENT

QUADRILATERAL COMPONENT	15.24	15.39	15.69	15.68	15.49	15.63	15.56
M0	24.54	28.09	26.17	30.32	26.59	27.62	27.30
M1	52.40	58.77	56.66	53.24	51.23	51.80	54.19
M2	23.37	13.14	17.57	16.44	22.18	20.58	18.51
A-SITE	30.49	30.39	33.22	26.83	35.58	32.94	35.00
MAP4	1.49	.12	.00	5.69	6.74	6.79	3.52
AL4	68.02	69.49	66.78	67.42	57.68	60.27	61.47

APPENDIX C. MICROPROBE ANALYSES OF AMPHIROLES IN CAYMAN TROUGH PLUTONICS

PAGE 15

ANALYSIS	615-5-1	615-5-1	616-1-2	616-1-2	616-1-2	616-6-1	616-6-1	616-6-1
	1-4	1-5	1D	12	13 or 14	2-1	2-2	
SiO2	45.92	49.58	49.66	50.67	50.01	44.83	46.27	
Al2O3	6.45	6.76	7.28	7.34	6.56	10.52	9.12	
FeO	9.97	9.76	11.01	9.86	10.28	11.70	10.24	
Fe2O3	.00	.00	.00	.00	.00	.00	.20	
MgO	16.91	16.87	16.59	17.17	17.36	14.24	15.33	
MnO	.08	.13	.25	.15	.14	.15	.14	
TiO2	1.22	1.41	1.56	1.65	1.51	1.40	1.12	
CaO	11.62	11.94	11.90	12.08	12.00	11.76	12.08	
Na2O	1.80	1.84	2.49	2.39	2.46	2.23	2.01	
K2O	.11	.11	.16	.11	.14	.29	.23	
TOTAL	98.26	98.44	100.90	101.42	100.26	97.12	96.74	

NO. OF IONS/23 OXYGENS

Si	7.1253	7.0675	6.9666	7.0165	7.0360	6.5905	6.7722
Al4	.9325	.9325	1.0334	.9835	.9700	1.4095	1.2278
Al6	.2100	.2069	.1706	.2148	.1171	.4138	.3458
Fe2	1.1931	1.1659	1.2917	1.1419	1.2085	1.4385	1.2534
Fe3	.0000	.0000	.0000	.0000	.0000	.0000	.0221
Mg	3.5971	3.5839	3.4665	3.5434	3.6369	3.1199	3.3439
Mn	.0097	.0137	.0297	.0176	.0167	.0187	.0174
Ti	.1288	.1512	.1646	.1718	.1546	.1548	.1233
Ca	1.8078	1.9237	1.7808	1.7524	1.8075	1.8525	1.8945
Na	.4982	.5086	.6773	.6417	.6160	.6356	.5704
K	.0200	.0200	.0266	.0194	.0251	.0544	.0429

QUADRILATERAL COMPONENT

SiO2	15.46	15.48	15.62	15.54	15.59	15.69	15.61
Al2O3	27.41	27.74	27.31	27.67	27.17	28.90	29.18
FeO	54.54	54.52	52.96	54.70	54.07	48.67	51.51
Fe2O3	18.95	17.74	19.72	17.63	18.17	22.44	19.31
A-SITE	33.19	32.57	35.63	33.02	36.46	32.77	33.31
NAP4	4.01	3.00	4.75	7.18	3.53	.09	.00
AL4	62.00	63.62	59.41	59.80	60.61	67.13	66.69

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIPHOLLS IN CAYMAN TROUGH PLUTONICS
PAGE 17

ANALYSIS	616-7-2B	616-7-2B	616-7-2B	616-7-2B	616-7-2B	620-5-1	620-5-1
	4-2	4-3	4-4	5-7	5-7	1/4	
SiO2	46.12	47.55	44.50	52.71	52.71	42.58	42.88
Al2O3	8.73	7.40	10.23	3.90	3.73	11.52	10.51
FeO	14.07	12.82	13.47	12.11	12.69	10.67	10.92
Fe2O3	1.27	.41	.00	.00	.00	.00	.00
MgO	13.01	14.17	13.22	15.87	15.40	14.34	14.05
MnO	.16	.16	.16	.12	.19	.17	.16
TiO2	.73	1.11	2.31	.25	.25	4.07	3.32
CaO	11.95	12.10	11.90	12.40	12.30	11.70	11.80
Na2O	1.97	1.61	2.15	.65	.64	3.04	2.66
K2O	.32	.20	.33	.06	.06	.26	.28
TOTAL	98.33	97.53	98.27	98.07	97.97	98.35	96.58

NO. OF IONS/23 OXYGENS

SI	6.7817	6.9682	6.5310	7.5521	7.5792	6.2085	6.3650
AL	1.2183	1.0318	1.4690	1.4479	1.4208	1.7915	1.6350
FE	2.951	.2467	.3010	.2109	.2115	1.087	.2042
FE2	1.7306	1.5711	1.6533	1.4511	1.5260	1.3011	1.3556
FE3	.1399	.0455	.0000	.0000	.0000	.0000	.0000
MG	2.9511	3.0947	2.8916	3.3887	3.3001	3.1161	3.1081
MN	.0199	.0199	.0199	.0146	.0231	.0210	.0201
TI	.0007	.1323	.0000	.0269	.0270	.4463	.3706
CA	1.8828	1.9000	1.6714	1.9037	1.8951	1.8279	1.8768
NA	.5617	.4575	.6118	.1806	.1744	.8594	.7656
K	.0600	.0374	.0618	.0110	.0110	.0484	.0530
QUADRILATERAL COMPONENT	15.62	15.50	15.67	15.19	15.17	15.81	15.75
W	29.13	28.94	29.17	28.23	28.20	29.27	29.60
EN	44.10	47.13	45.07	50.25	49.10	49.90	49.02
FS	26.77	23.93	25.77	21.52	22.70	20.83	21.38
A-SITE	33.79	32.42	31.07	29.30	28.24	29.97	30.73
NAP4	.00	.00	.36	.65	2.80	3.66	2.63
AL4	66.41	67.58	63.96	7.05	68.96	66.37	66.64

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIPHILES IN CAYMAN TROUGH PLUTONICS
PAGE 16

ANALYSIS	620-5-1	620-5-7	621-3-2	621-3-2	621-3-2	621-3-2	621-6-1	621-6-1
SiO2	42.18	42.91	57.01	44.62	44.15	43.80	43.28	43.80
Al2O3	11.58	11.69	.57	11.96	11.87	10.43	11.05	11.05
FeO	9.94	10.07	3.50	6.18	6.40	10.97	10.99	10.99
Fe2O3	.00	.00	.00	.00	.00	.00	.00	.00
MgO	13.98	14.75	23.22	16.77	16.87	15.24	14.65	14.65
CaO	.12	.13	.06	.09	.07	.20	.26	.26
TiO2	4.00	3.58	.00	3.70	3.70	3.54	3.29	3.29
CaC	11.54	11.38	12.25	12.27	12.05	10.80	10.84	10.84
Na2O	2.89	3.20	.24	2.53	2.42	2.67	2.55	2.55
K2O	.31	.31	.01	.36	.35	.38	.46	.46
TOTAL	96.94	97.98	97.66	98.48	97.88	98.03	97.37	97.37

NO. OF IONS/23 OXYGENS

SI	6.2118	6.2526	7.9345	6.3341	6.3114	6.3829	6.3535	6.3535
AL	1.7682	1.7474	.0655	1.6659	1.6866	1.6171	1.6465	1.6465
FE	.2918	.2608	.0267	.3356	.3119	.1748	.2659	.2659
FE2	1.2243	1.2272	.4018	.7337	.7652	1.3378	1.3493	1.3493
FE3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Mg	3.0683	3.2032	4.7456	3.5479	3.5941	3.3099	3.2051	3.2051
MN	.0150	.0160	.0070	.0108	.0085	.0247	.0323	.0323
TI	.0430	.0423	.0000	.0350	.0378	.0860	.0632	.0632
CA	1.8410	1.7706	1.8715	1.8663	1.8458	1.6864	1.7051	1.7051
NA	.8252	.9041	.0639	.6963	.6708	.7544	.7259	.7259
K	.0562	.0576	.0018	.0652	.0638	.0706	.0862	.0862
QUADRILATERAL COMPONENT	15.75	15.83	15.05	15.65	15.66	15.75	15.73	15.73

QUADRILATERAL COMPONENT

SiO2	29.79	28.55	25.91	30.36	29.75	26.63	27.24	27.24
Al2O3	50.19	51.66	68.31	57.71	57.92	52.26	51.20	51.20
FeO	20.03	19.79	5.78	11.93	12.33	21.11	21.56	21.56
A-SITE	27.96	30.70	39.82	26.81	27.15	30.54	29.82	29.82
CA-MN	5.11	4.80	10.22	4.56	3.17	3.25	3.21	3.21
ALN	66.53	64.50	49.96	68.63	69.68	66.22	66.97	66.97

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 15

ANALYSIS	621-b-1	621-b-1	621-b-1	621-b-1	621-b-1	621-b-1	621-b-1
	13	2-4	2-5	2-6	2-9	2-9	1-1
SiO2	43.03	49.13	50.33	49.85	43.51	43.03	57.60
Al2O3	10.77	7.46	7.45	7.24	12.96	12.88	.61
FeO	10.06	8.56	8.10	8.82	8.58	8.07	4.28
Fe2O3	.00	1.19	.00	.00	2.39	2.56	.00
MgO	14.72	17.39	18.17	18.16	15.40	15.33	21.98
MnO	.21	.29	.22	.38	.16	.17	.08
TiO2	3.25	.43	.16	.12	.76	.99	.00
CaO	11.15	11.33	11.59	10.38	11.35	11.52	12.48
Na2O	2.53	1.40	1.75	1.74	2.38	2.29	.18
K2O	.52	.21	.09	.08	.52	.57	.03
TOTAL	97.22	97.39	97.79	96.77	97.71	97.41	97.24

NO. OF IONS/23 OXYGENS

Si	6.4023	7.0452	7.1367	7.1522	6.2867	6.2688	7.9688
Al4	1.5977	.9588	.8533	.6478	1.7113	1.7312	.0312
Al6	.2654	.3064	.3888	.3769	.5072	.4809	.0682
Fe2	1.3082	1.0269	.9656	1.0593	1.0472	.9829	.4952
Fe3	.0000	.1280	.0000	.0000	.2280	.2806	.0000
Mg	3.2191	3.7164	3.6396	3.8831	3.3325	3.3284	4.5319
Mn	.0201	.0352	.0204	.0462	.0197	.0210	.0094
Ti	.3587	.2469	.0504	.0129	.1058	.1045	.0000
Ca	1.7531	1.7409	1.7610	1.5958	1.7659	1.7983	1.8500
Na	.6544	.3893	.4812	.4640	.6751	.6469	.0483
K	.0392	.0384	.0195	.0146	.0963	.1059	.0053

QUADRILATERAL

COMPONENT	15.68	15.43	15.48	15.47	15.77	15.75	15.01
W	27.91	26.85	26.84	24.41	28.76	29.83	26.90
EN	51.26	57.32	58.52	59.40	54.27	54.48	65.90
FS	25.83	15.84	14.84	16.19	16.97	16.09	7.20
A-SITE	29.10	30.94	35.22	35.04	30.93	30.31	9.78
WAP4	2.95	.00	1.25	1.99	.00	.00	53.39
AL4	67.75	69.06	63.53	62.96	69.07	69.69	36.84

APPENDIX B. MICROPROBE ANALYSES OF AMPHIPHILES IN CAYMAN TROUGH PLUTONICS
PAGE 20

ANALYSIS	622-1-1	623-6-1	623-6-1	623-6-1	623-6-1	623-6-1	737-1-1
SiO2	1-2	2	4	5	6	8	1-1
AL2O3	57.37	47.21	46.61	47.67	50.57	46.98	46.41
FeO	.67	9.17	10.33	9.02	6.86	9.87	8.12
FE2O3	4.33	7.89	8.93	8.48	9.62	8.67	15.27
MgO	.00	.00	.00	.00	.00	.00	.00
MNO	21.74	16.84	16.12	17.50	17.85	17.04	12.92
TiO2	.10	.11	.14	.16	.12	.14	.24
CaO	.03	1.98	1.62	1.52	.88	1.63	.96
Na2O	13.08	11.55	12.28	12.26	12.22	11.90	11.32
K2O	.65	2.80	2.77	2.82	2.15	2.82	2.22
TOTAL	.93	.40	.51	.42	.11	.38	.46
TOTAL	97.80	97.95	99.31	99.85	99.58	99.43	97.92

NO. OF IONS/23 OXYGENS

SI	7.9152	6.7548	6.6296	6.7255	7.1012	6.6553	6.8677
AL4	.0848	1.2452	1.3704	1.2785	.8988	1.3447	1.1323
AL6	.0567	.3016	.3618	.2257	.2369	.3037	.2843
FE2	.4996	.9441	1.0623	1.0006	1.0593	1.0272	1.8898
FE3	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Mg	4.4701	3.5999	3.4171	3.6796	3.7356	3.5975	2.8493
MN	.0117	.0133	.0165	.0191	.0143	.0168	.0301
TI	.0031	.2131	.1733	.1613	.0718	.1737	.1068
CA	1.9337	1.7707	1.8715	1.8534	1.8387	1.8063	1.7949
NA	.0668	.7768	.7639	.7714	.5854	.7746	.6369
K	.0053	.0730	.0925	.0756	.0197	.0687	.0868

QUADRILATERAL

COMPONENT	15.05	15.68	15.76	15.79	15.56	15.77	15.68
P0	28.01	28.08	29.47	26.37	27.72	28.09	27.87
EN	64.75	56.95	53.80	56.32	56.31	55.94	43.61
F3	7.24	14.97	16.73	15.31	15.97	15.97	28.92
A-SITE	29.96	32.63	34.10	37.08	37.35	35.12	36.59
NAPM	16.01	7.93	4.36	2.85	2.89	3.42	2.41
AL4	54.03	59.44	61.54	60.08	59.76	61.46	61.00

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 21

ANALYSIS	737-1-1	737-1-1	737-1-1	737-1-1	737-1-1	737-1-1	737-1-1	737-1-1
	1-2	4-3	4-4	4-5	4-6	PX1	PX2	
SiO2	54.75	48.13	52.88	53.07	53.98	56.02	57.10	
Al2O3	1.22	6.49	2.47	2.07	1.27	.97	.51	
FeO	10.65	14.16	11.50	11.29	10.30	8.33	7.72	
Fe2O3	.64	.20	.98	.75	.90	.60	.50	
MgO	17.72	14.05	16.59	17.54	17.89	19.43	20.64	
MnO	.19	.23	.18	.21	.14	.14	.20	
TiO2	.09	1.46	.21	.11	.14	.10	.05	
CaO	12.01	11.21	11.92	11.20	11.55	12.40	12.02	
Na2O	.34	1.88	.55	.34	.28	.19	.25	
K2O	.24	.37	.36	.36	.34	.00	.00	
TOTAL	97.69	97.98	97.35	96.14	95.99	98.18	98.49	

NO. OF IONS/23 OXYGENS

Si	7.8009	7.0518	7.6306	7.7161	7.8119	7.8520	7.9265
Al4	.1991	.9482	.3694	.2839	.1861	.1480	.0735
Al6	.0058	.1728	.0508	.0710	.0265	.0123	.0099
Fe2	1.2929	1.7351	1.3879	1.3725	1.2470	.9768	.8963
Fe3	.0728	.0000	.1032	.0618	.0432	.0630	.0000
Mg	3.7628	3.0679	3.5678	3.6923	3.8565	4.0988	4.2701
Mn	.0229	.0265	.0220	.0259	.0172	.0166	.0235
Ti	.0096	.1606	.0228	.0120	.0152	.0105	.0052
Ca	1.8336	1.7599	1.8431	1.7449	1.7910	1.8623	1.7879
Na	.0939	.5341	.1539	.0959	.0766	.0516	.0673
K	.0073	.0692	.0109	.0111	.0074	.0000	.0000
QUADRILATERAL COMPONENT	15.10	15.53	15.17	15.11	15.09	15.05	15.06
SiO	26.62	26.82	27.11	25.62	25.97	27.00	25.71
En	54.62	46.75	52.48	54.22	55.95	58.84	61.40
Fs	18.77	26.44	20.41	20.15	18.58	14.16	12.89
A-SITE	33.70	34.06	31.11	27.37	31.36	25.87	42.76
AM4	.00	4.82	.00	.00	.00	.00	5.03
AL4	66.30	61.12	68.89	72.63	68.64	74.13	52.21

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 22

ANALYSIS	797-1-1	797-1-1	797-1-1	797-1-1	797-1-2	797-1-2	797-1-2	797-1-2
	PX3	PX4	PX5	PX6	3-1	3-2	3-3	
SiO2	57.16	54.92	55.56	55.23	44.01	45.40	44.50	
Al2O3	1.33	1.74	1.53	1.44	11.55	10.98	11.16	
FeO	6.41	9.47	10.70	12.27	11.59	11.41	11.52	
Fe2O3	.00	.29	.28	.16	.30	.23	.00	
MgO	21.83	19.04	18.28	18.13	14.72	15.44	14.63	
MnO	.17	.14	.14	.15	.16	.18	.16	
TiO2	.09	.60	.11	.21	2.92	2.21	2.45	
CaO	11.03	11.89	11.89	10.72	11.81	11.40	11.57	
Na2O	.31	.48	.24	.30	2.57	2.31	2.27	
K2O	.00	.00	.00	.00	.38	.30	.29	
TOTAL	98.58	98.47	98.03	98.61	99.51	99.86	98.55	

NO. OF IONS/23 OXYGENS

Si	7.8698	7.7086	7.8650	7.8079	6.3334	6.4795	6.4462
Al	.1322	.2885	.1350	.1921	1.6666	1.5205	1.5534
Al6	.0938	.0000	.0369	.0879	.2929	.3270	.3520
Fe	.7381	1.1136	1.2662	1.4511	1.3768	1.3617	1.3956
Fe3	.0000	.0307	.0089	.0173	.0000	.0252	.0000
Mg	4.4793	3.9901	3.8565	3.8198	3.1570	3.2841	3.1584
Mn	.0195	.0167	.0168	.0180	.0195	.0218	.0196
Ti	.0293	.0635	.0117	.0223	.3160	.2372	.2669
Ca	1.6272	1.7915	1.8035	1.6239	1.6211	1.7434	1.7958
Na	.0828	.1309	.0655	.0822	.7171	.6392	.6376
K	.0000	.0000	.0000	.0000	.0698	.0546	.0536

QUADRILATERAL COMPONENT

SiO2	23.77	25.98	26.04	23.55	26.68	27.29	28.28
En	65.44	57.87	55.88	55.40	49.73	51.40	49.74
Fs	10.78	16.15	18.28	21.05	21.59	21.31	21.98
A-SITE	23.80	31.21	32.79	29.97	31.15	31.33	30.27
NaMn	15.26	.00	.00	.00	.92	.00	.52
Al4	61.14	68.79	67.01	70.03	67.93	68.67	69.21
QUADRILATERAL COMPONENT	15.65	15.13	15.07	15.08	15.76	15.69	15.88

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIROLES IN LAYMAN TROUGH PLUTONICS
PAGE 23

ANALYSIS	797-1-2		797-1-2		797-1-2		797-1-1		799-1-1	
	2-4	2-5	2-6	1-7	1-9	1-9	2-3	2-4	2-4	2-4
SiO2	51.29	46.82	47.52	40.71	48.84	56.82	43.36	12.91	43.36	12.91
Al2O3	4.92	5.83	5.34	15.30	5.79	1.13	5.77	5.77	5.77	5.77
FeO	14.12	13.85	11.22	16.22	14.98	2.71	16.78	16.78	16.78	16.78
Fe2O3	1.09	1.76	3.06	2.82	1.73	.83	.00	.00	.00	.00
MgO	14.44	14.78	14.49	6.59	12.85	22.02	16.78	16.78	16.78	16.78
MnO	.41	.45	.32	.35	.46	.12	.17	.17	.17	.17
TiO2	.14	.21	.10	.06	.57	.00	.00	.00	.00	.00
CaO	11.33	10.60	11.21	11.53	11.31	13.29	12.36	12.36	12.36	12.36
Na2O	.04	.75	1.20	2.44	.82	.27	2.25	2.25	2.25	2.25
K2O	.06	.06	.08	.15	.09	.03	.49	.49	.49	.49
TOTAL	98.14	97.01	97.77	98.17	97.43	96.42	97.11	97.11	97.11	97.11

NO. OF IONS/23 OXYGENS

Si	7.4352	7.2910	6.9141	6.1107	7.2117	7.8239	6.2387	6.2387	6.2387	6.2387
Al4	.5646	.7090	1.3859	1.8893	.7883	.1761	1.7613	1.7613	1.7613	1.7613
Al6	.2247	.2451	.3447	.8182	.2197	.0099	.4286	.4286	.4286	.4286
Fe2	1.7121	1.5969	1.3721	2.0363	1.8534	.3164	.6943	.6943	.6943	.6943
Fe3	.1186	.1937	.3377	.3187	.1922	.0877	.0000	.0000	.0000	.0000
Mg	3.1197	2.2236	3.1420	1.9216	2.6278	4.5833	3.5982	3.5982	3.5982	3.5982
Mn	.0503	.0558	.3394	.0485	.0575	.0142	.0122	.0122	.0122	.0122
Ti	.0153	.0231	.0159	.0068	.0159	.0000	.3344	.3344	.3344	.3344
Ca	1.7599	1.6622	1.7477	1.8544	1.7895	1.9688	1.9255	1.9255	1.9255	1.9255
Na	.1799	.2172	.3668	.7101	.2348	.0731	.6277	.6277	.6277	.6277
K	.0111	.0112	.0149	.0287	.0151	.0053	.0899	.0899	.0899	.0899
QUADRILATERAL COMPONENT	15.19	15.22	15.36	15.74	15.25	15.08	15.69	15.69	15.69	15.69
NO	26.71	25.64	27.08	31.91	27.07	28.07	30.74	30.74	30.74	30.74
EN	47.33	49.73	51.13	33.06	43.72	66.53	50.05	50.05	50.05	50.05
FS	25.97	24.63	21.99	35.03	29.61	4.59	11.20	11.20	11.20	11.20
A-SITE	25.27	24.01	26.00	28.11	24.67	30.82	27.87	27.87	27.87	27.87
MAP4	.00	.00	.00	.00	.00	.00	1.08	1.08	1.08	1.08
AL4	74.73	75.99	74.00	71.89	75.57	69.18	71.05	71.05	71.05	71.05

APPENDIX 9. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 24

ANALYSIS	739-1-1	739-2-2	739-2-2	739-2-2	739-2-2	739-2-2	739-2-2
SiO2	3-5 47.69	1-1 49.34	1-2 49.98	1-3 43.81	1-4 43.97	2-5 45.27	2-6 44.34
Al2O3	11.67	6.03	5.46	12.16	11.72	12.17	12.32
FeO	6.94	11.59	12.50	6.60	6.19	4.98	5.00
Fe2O3	.00	.00	.00	.00	.00	.00	.00
MgO	16.00	14.45	14.26	16.23	16.46	18.05	17.72
MnO	.15	.33	.32	.10	.11	.08	.08
TiO2	4.17	.21	.05	3.88	3.34	2.42	2.94
CaO	12.27	12.58	12.47	12.30	12.59	12.44	12.36
Na2O	2.41	1.22	.67	2.48	2.39	2.26	2.48
K2O	.34	.37	.09	.23	.24	.27	.27
TOTAL	97.84	97.85	97.18	97.79	97.01	97.94	97.51

NO. OF IONS/23 OXYGENS

Si	6.3026	7.1174	7.3034	6.2787	6.3425	6.4064	6.3199
Al4	1.6974	.9826	.6996	1.7213	1.6575	1.5936	1.6801
Al6	.2762	.4831	.2441	.3333	.3355	.4368	.3901
Fe2	.8335	1.3977	1.5276	.7911	.7467	.5894	.5960
Fe3	.0000	.0054	.0715	.0000	.0000	.0000	.0000
Mg	3.4242	2.1065	3.1042	3.4066	3.5385	3.8068	3.7641
Mn	.0182	.0403	.0406	.0121	.0134	.0096	.0097
Ti	.0503	.0228	.0604	.0182	.0323	.0276	.0151
Ca	1.8860	1.4445	1.9517	1.8889	1.9459	1.8663	1.8877
Na	.6711	.3356	.2404	.6891	.6685	.6202	.6854
K	.0623	.0129	.0168	.0421	.0442	.0487	.0491
QUADRILATEAL COMPONENT	15.63	15.35	15.66	15.64	15.65	15.66	15.70
NO	30.72	30.15	29.65	30.73	31.23	30.02	30.21
LN	55.72	48.17	47.15	56.40	56.79	60.59	60.25
FS	13.56	21.67	23.20	12.87	11.98	9.38	9.54
A-SITE	25.75	26.31	27.34	26.15	27.78	28.96	28.87
AP4	.00	.00	.00	3.66	2.28	.60	1.55
AL4	69.63	71.69	72.66	70.10	69.93	70.44	69.58

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 25

ANALYSIS	799-2-2	799-2-2	799-2-2	799-2-2	799-3-1	799-3-1	799-3-1
SiO2	2-7 44.27	2-8 56.34	2-10 52.79	2-1 48.70	2-5 42.51	2-6 43.96	2-7 43.50
Al2O3	12.52	1.12	4.00	6.34	12.22	11.59	11.68
FeO	4.85	2.79	2.97	10.22	8.50	8.15	8.20
Fe2O3	.00	.00	1.11	3.44	.00	.00	.00
MgO	17.52	23.67	20.77	15.12	15.25	15.76	15.49
MnO	.07	.11	.11	.19	.14	.13	.09
TiO2	2.59	.00	.10	.30	3.86	3.68	3.48
CaO	12.50	10.76	13.00	12.53	12.37	12.55	12.55
Na2O	2.40	.04	.90	1.29	2.36	2.16	2.00
K2O	.18	.02	.03	.12	.32	.32	.34
TOTAL	96.41	94.85	96.48	98.25	97.53	98.30	97.33

NO. OF IONS/23 OXYGENS

Si	6.3734	7.9040	7.4184	7.0471	6.1828	6.3149	6.3118
Al4	1.6266	.0960	.5816	.9529	1.8172	1.6851	1.6882
Al6	.4135	.0893	.2136	.1287	.2781	.2777	.3094
Fe2	.5840	.3273	.3491	1.2373	1.0339	.9791	.9951
Fe3	.0000	.0000	.1175	.3747	.0000	.0000	.0000
Mg	3.7593	4.9489	4.3499	3.2678	3.3056	3.3740	3.3497
Mn	.0005	.131	.0131	.0233	.0172	.0158	.0111
Ti	.2814	.0000	.0000	.0326	.4242	.3976	.3798
Ca	1.9203	1.6175	1.9575	1.9428	1.9278	1.9317	1.9312
Na	.6700	.0100	.2452	.3619	.6655	.6016	.5627
K	.0349	.0036	.0034	.0222	.0594	.0586	.0629

QUADRILATERAL COMPONENT

SiO2	15.68	15.01	15.25	15.38	15.71	15.64	15.62
Al2O3	30.75	23.46	29.41	30.16	30.76	30.74	30.99
FeO	59.94	71.79	65.35	50.63	58.74	53.68	53.20
Fe2O3	9.31	4.75	5.24	19.21	16.50	15.58	15.61
A-SITE	29.10	9.58	20.11	28.73	27.92	27.13	26.89
MAP4	1.13	3.52	.00	.30	.60	1.02	.15
AL4	69.77	86.50	69.69	71.27	71.48	71.85	72.96

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS

PAGE 26

ANALYSIS	739-3-1	739-4-2	739-N-2	739-4-2	739-4-2	739-4-2
	1-8	1-9	2-3	2-4	2-5	2-6
SiO2	42.94	43.64	50.49	47.90	50.62	47.97
Al2O3	12.64	12.88	4.74	5.77	3.82	5.93
FeO	5.60	5.54	15.18	17.45	17.93	19.92
Fe2O3	.63	1.26	.37	2.38	1.82	2.33
MgO	16.91	16.78	14.31	10.67	11.24	9.37
MnO	.10	.11	.43	.33	.41	.34
TiO2	3.21	2.40	.94	.70	.39	.58
CaO	12.14	12.36	11.32	11.73	12.06	11.75
Na2O	2.24	2.12	.91	.78	.39	.70
K2O	.30	.30	.24	.32	.10	.35

TOTAL 97.11 97.19 98.30 98.80 98.23 98.78 99.24

NO. OF IONS/23 OXYGENS

Si	6.1916	6.2697	7.3221	7.1341	7.4592	7.1488
Al4	1.2062	1.7303	.6779	.8619	.5008	.9512
Al6	.3405	.4513	.1325	.1518	.1228	.1907
Fe2	.6999	.6662	1.8410	2.1744	2.2092	2.4828
Fe3	.0900	.1146	.0000	.2671	.2013	.2616
Mg	3.6340	3.5928	3.0928	2.4141	2.4684	2.8811
Mn	.0122	.0134	.0528	.0417	.0512	.0429
Ti	.3461	.2593	.1525	.0765	.0432	.0650
Ca	1.8757	1.9027	1.7338	1.8730	1.9042	1.8763
Na	.6263	.5936	.2559	.2254	.1114	.2023
K	.0552	.0550	.0444	.0608	.0188	.0665

QUADRILATEAL COMPONENT

SiO2	15.68	15.65	15.19	15.29	15.13	15.27
Al4	30.21	30.86	26.20	26.99	28.93	29.13
Al6	56.52	58.31	42.33	46.35	37.50	32.31
Fe3	11.27	10.81	31.47	33.65	33.57	38.55
A-SITE	27.37	27.17	33.22	24.93	19.41	24.00
NAH4	.00	.00	1.03	.00	.00	.00
AL4	72.83	72.83	65.74	75.07	80.59	76.00

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 27

ANALYSIS 799-4-2 739-4-1 799-6-1 739-6-1 739-6-1 739-6-1 739-6-1

	3-4	3-5	3-6	3-7	5-8	5-9
SiO2	45.66	49.68	52.61	50.40	47.64	50.27
Al2O3	8.18	6.45	7.53	7.01	10.69	8.34
FeO	14.49	8.31	7.22	7.00	6.56	6.17
Fe2O3	.02	.00	.00	.47	1.21	.69
MgO	13.56	17.58	17.15	16.03	17.51	18.72
MnO	.35	.11	.16	.11	.09	.13
TiO2	2.65	1.28	1.39	.43	.70	.30
CaO	11.44	12.39	12.10	12.43	12.28	12.21
Na2O	2.22	1.83	.79	1.30	1.69	1.31
K2O	.07	.25	.17	.64	.37	.28
TOTAL	98.19	97.64	97.56	97.59	98.74	98.42

NO. OF ICNS/23 OXYGENS

SI	6.7234	7.1826	7.0747	7.4138	7.1534	6.7101	7.0409
AL4	1.2766	.8174	.9253	.5862	.8466	1.2899	.9591
AL6	.1428	.2633	.3388	.2511	.3263	.8853	.4180
FE2	1.7840	.9520	.9730	.8539	.8307	.7729	.7232
FE3	.0021	.0000	.0000	.0000	.0501	.1283	.0722
MG	2.9744	3.7235	3.6397	4.0050	3.8138	3.6756	3.9076
MN	.0436	.0132	.0169	.0191	.0132	.0107	.0154
TI	.2491	.1368	.1469	.0456	.0748	.0742	.0316
CA	1.8042	1.8867	1.6833	1.8271	1.8908	1.8533	1.8324
NA	.6336	.2839	.3203	.2158	.2752	.4615	.3558
K	.0000	.0453	.0472	.0306	.0435	.0665	.0500

QUADRILATERAL COMPONENT

QO	27.49	28.75	28.55	27.38	26.93	29.41	28.35
Q4	45.32	56.74	56.38	59.93	56.36	58.33	60.46
FS	27.18	14.51	15.17	12.73	12.71	12.26	11.19
A-SITE	33.17	26.58	25.36	29.45	27.35	29.05	29.73
MA4	.00	2.12	3.05	.15	.40	.00	.00
AL4	66.63	71.29	71.57	70.40	72.65	70.95	70.27

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 20

ANALYSIS	739-6-1	739-6-1	739-6-1	740-7-1	740-7-1	740-7-1	740-7-1
	5-10	5-11	5-12	4-1	4-2	4-3	4-4
SiO2	57.06	51.26	49.79	47.13	41.40	55.90	57.18
Al2O3	.78	6.30	7.30	11.87	15.43	1.90	1.18
FeO	5.42	6.40	7.16	8.57	9.61	5.70	5.32
Fe2O3	.00	.00	.00	1.83	3.03	.00	.00
MgO	21.30	19.12	18.33	15.23	13.72	21.37	22.61
MnO	.30	.38	.11	.05	.12	.12	.16
TiO2	.00	.70	1.11	.20	.11	.00	.00
CaO	12.64	12.09	12.25	12.87	11.92	12.39	11.06
Na2O	.10	1.17	1.26	1.73	3.21	.64	.51
K2O	.03	.21	.28	.12	.42	.10	.03
TOTAL	97.65	97.35	97.31	99.60	98.41	98.12	98.05

NO. OF IONS/23 OXYGENS

Si	7.9215	7.2406	7.0841	6.6474	6.0203	7.7528	7.8707
Al4	.0795	.7594	.9159	1.3526	1.9737	.2472	.1293
Al6	.0492	.2893	.3086	.6212	.6717	.0634	.0622
Fe2	.6291	.7558	.8544	1.0113	1.0956	.6611	.6124
Fe3	.0000	.0000	.0000	.1993	.3320	.0000	.0000
Mg	4.4054	4.0234	3.8231	3.2014	3.0168	4.4170	4.6382
Mn	.0353	.0096	.0133	.0060	.0148	.0141	.0187
Ti	.0000	.0743	.1188	.0212	.0120	.0000	.0000
Ca	1.8796	1.8291	1.8676	1.9450	1.8574	1.8412	1.6313
Na	.0209	.3203	.3476	.4731	.9031	.1721	.1361
K	.0053	.0378	.0508	.0216	.0408	.0177	.0053
QUADRILATERAL COMPONENT	15.03	15.34	15.38	15.50	15.95	15.19	15.10

SiO	27.19	27.68	28.53	31.59	31.11	26.61	23.75
Ca	63.72	60.98	60.41	51.99	50.53	63.84	67.40
FS	9.1	11.44	13.35	16.42	18.36	9.55	8.95
A-SITE	27.79	30.40	29.22	26.78	32.40	42.74	38.50
NAF4	1.05	1.05	.00	.00	.00	.69	13.74
AL4	70.04	67.05	69.64	73.22	67.60	56.57	47.76

APPENDIX B. MICROPROBE ANALYSES OF AMPHIBOLLS IN CAYMAN TROUGH PLUTONICS
PAGE 29

ANALYSIS	740-7-1	740-7-1	740-7-1	740-7-1	740-7-1	740-7-1	740-7-1
	1-5	2-8	2-9	2-10	2-11	2-12	2-13
SiO2	46.11	51.00	54.46	51.61	50.14	50.38	49.66
Al2O3	10.03	5.42	1.52	4.00	4.79	4.58	5.00
FeO	10.50	9.91	10.55	12.72	12.83	12.86	12.89
Fe2O3	.63	.63	.50	.00	.50	.00	.00
MgO	15.17	17.22	17.04	16.15	15.63	15.56	15.19
MnO	.13	.14	.13	.18	.23	.37	.39
TiO2	.37	1.32	.79	.91	1.37	1.37	1.61
CaO	12.42	12.06	11.36	11.92	11.37	11.29	11.37
Na2O	2.34	1.11	.77	1.17	1.24	1.14	1.52
K2O	.62	.29	.05	.31	.36	.36	.41
TOTAL	98.52	98.60	97.27	98.27	97.06	97.91	98.04

NO. OF IONS/23 OXYGENS

Si	6.6733	7.2427	7.7815	7.4171	7.2859	7.3056	7.2175
Al4	1.3267	.7573	.2165	.5829	.7121	.6944	.7825
Al6	.3846	.1501	.0375	.0948	.1110	.0686	.0743
Fe2	1.2712	1.1774	1.2607	1.4447	1.5601	1.5596	1.5668
Fe3	.0905	.0673	.0000	.0000	.0000	.0000	.0000
Mg	3.2722	3.6486	3.7583	3.4590	3.3807	3.3627	3.2902
Mn	.0159	.0168	.0157	.0219	.0283	.0454	.0480
Ti	.0433	.1089	.0984	.1170	.1494	.1494	.1760
Ca	1.9200	1.8351	1.7392	1.8356	1.7713	1.7542	1.7707
Na	.6586	.3056	.2133	.3260	.3495	.3206	.4288
K	.1145	.0163	.0071	.0568	.0668	.0666	.0760

QUADRILATERAL COMPONENT

SiO2	15.77	15.32	15.12	15.34	15.39	15.35	15.43
Al2O3	29.77	27.57	25.74	27.24	26.37	26.27	26.72
FeO	50.58	54.75	55.00	51.33	50.41	50.37	49.64
Fe2O3	19.65	17.89	18.166	21.44	23.22	23.36	23.64
SiO2	36.76	29.83	26.50	34.91	34.69	32.09	33.44
Al2O3	.00	.00	23.95	4.73	2.27	3.70	5.76
Al4	63.24	76.17	49.56	60.36	63.34	64.21	60.81

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 30

ANALYSIS	740-7-1	740-7-1	740-7-1	740-7-1	741-1-1	741-1-1	741-1-1
SiO2	2-71	2-15	2-16	2-7	8-2	2-4	2-5
AL2O3	54.41	53.03	53.11	51.88	52.69	46.78	45.27
FeO	2.52	3.29	4.28	4.55	4.81	9.09	9.89
Fe2O3	8.61	9.41	8.65	9.43	6.63	10.55	10.61
MgO	.00	.00	.00	.00	.98	.00	.00
MnO	18.67	18.07	18.34	17.68	19.39	14.83	14.35
TiO2	.19	.19	.14	.21	.19	.20	.16
CaO	.26	.83	.05	.07	.14	2.03	2.74
Na2O	11.28	11.39	11.60	11.28	11.92	12.27	12.02
K2O	1.02	1.40	1.14	1.65	.75	1.23	1.64
TOTAL	.11	.17	.14	.17	.39	.41	.40
TOTAL	97.27	97.78	97.49	96.92	97.70	97.39	97.08

NO. OF IONS/Z3 OXYGENS

SI	7.7169	7.5402	7.5307	7.4522	7.4133	6.7933	6.6205
AL4	.2831	.4598	.4693	.5478	.5867	1.2067	1.3795
AL6	.1383	.0917	.2862	.2227	.2111	.3495	.3257
FE2	1.0450	1.1190	1.0305	1.1328	.7807	1.2813	1.2977
FE3	.0000	.0000	.0000	.0000	.1041	.0000	.0000
Mg	3.9463	3.8292	3.8756	3.7848	4.0658	3.2095	3.1276
MN	.0228	.0229	.0168	.0256	.0226	.0246	.0198
TI	.0277	.0277	.0053	.0076	.0190	.2217	.3014
CA	1.7142	1.7353	1.7624	1.7361	1.7970	1.9092	1.8839
NA	.2805	.3859	.3134	.4596	.2046	.3463	.4651
K	.0199	.0308	.0253	.0312	.0267	.0760	.0746
QUADRILATERAL COMPONENT	15.19	15.30	15.28	15.40	15.23	15.42	15.50
MO	25.56	25.96	26.43	26.09	27.05	29.83	29.86
EN	56.85	57.29	58.12	56.88	61.20	50.15	49.57
FS	15.59	16.74	15.45	17.03	11.75	20.02	20.57
A-SITE	33.39	34.64	34.11	36.55	28.45	25.66	25.81
MAW	18.09	12.91	7.81	8.70	.00	.26	2.31
AL4	46.51	52.45	58.08	52.75	71.55	74.08	71.88

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS

PAGE 31

ANALYSIS 741-1-1 741-1-1 741-2-1 741-2-1 741-2-1 741-2-1

	1-7	1-8	1-9	1-1	1-2A	1-2B	1-2C
SiO2	49.14	47.60	48.75	48.31	50.03	49.61	49.69
Al2O3	7.24	7.91	7.56	9.10	6.03	5.86	5.65
FeO	9.13	9.15	9.23	13.49	14.25	14.30	13.70
Fe2O3	.07	1.24	.80	.00	.00	.50	.00
MgO	16.94	16.04	16.56	14.60	14.24	14.12	14.52
MnO	.15	.17	.15	.23	.25	.28	.28
TiO2	1.39	1.33	1.14	1.46	1.33	1.30	1.31
CaO	11.91	11.93	12.01	11.22	11.73	11.40	11.53
Na2O	1.18	1.28	1.25	1.38	.97	.96	.94
K2O	.61	.22	.25	.34	.28	.29	.27
TOTAL	97.36	96.67	97.50	100.13	99.11	98.12	97.89

NO. OF IONS/23 OXYGENS

Si	7.0504	6.9191	7.0067	6.8707	7.2025	7.2167	7.2281
Al4	.9496	1.0809	.9933	1.3293	.7975	.7833	.7719
Al6	.2750	.2747	.2877	.3064	.2259	.2217	.1971
Fe2	1.0960	1.1126	1.1094	1.6045	1.7157	1.7397	1.6667
Fe3	.0079	.1139	.0650	.0000	.0030	.0070	.0000
Mg	3.6222	3.4748	3.5472	3.0945	3.0552	3.0612	3.1478
Mn	.0182	.0209	.0183	.0277	.0305	.0385	.0345
Ti	.1300	.1454	.1232	.1562	.1440	.1422	.1433
Ca	1.8310	1.8581	1.8496	1.7098	1.8094	1.7769	1.7971
Na	.3243	.3608	.3403	.3635	.2708	.2707	.2651
K	.0384	.0408	.0458	.0617	.0514	.0538	.0501
QUADRILATERAL COMPONENT	15.37	15.40	15.39	15.43	15.30	15.30	15.30

W0	27.96	28.83	28.43	26.68	27.50	27.01	27.18
EN	55.31	53.91	54.52	48.29	46.43	46.54	47.61
FS	16.73	17.26	17.05	25.04	26.07	26.45	25.21

A-SITE	27.86	27.09	28.41	27.95	27.05	27.16	27.75
AM4	.00	.00	.00	.69	1.72	2.14	1.24
AL4	72.14	72.91	71.59	71.86	71.23	70.70	71.00

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIPHILES IN CAYMAN TROUGH PLUTONICS
PAGE 32

ANALYSIS	741-2-1	741-2-1	741-2-1	741-2-1	741-2-1	741-2-1	741-2-1
SiO2	47.03	47.85	49.15	45.09	50.81	49.00	47.77
Al2O3	7.60	8.49	9.42	11.48	4.52	6.07	6.75
FeO	14.52	13.90	13.37	11.83	12.15	13.75	14.43
Fe2O3	0.00	0.00	0.00	1.89	1.20	0.00	0.00
P2O5	13.83	13.97	15.33	13.48	12.33	14.55	13.83
MnO	0.31	0.25	0.26	0.25	0.28	0.22	0.32
TiO2	2.11	0.52	1.39	0.52	0.12	1.64	1.93
CaO	10.79	10.91	11.06	11.46	12.61	11.25	10.99
MgO	1.58	1.36	1.30	1.65	0.27	1.29	1.47
K2O	0.32	0.34	0.33	0.51	0.13	0.33	0.32
TOTAL	98.09	97.59	98.63	98.16	97.42	98.10	97.81

NO. OF IONS/23 OXYGENS

Si	6.8903	6.9930	7.0950	6.5723	7.4775	7.1290	7.0100
Al4	1.1097	1.0070	0.9050	1.4277	0.5235	0.8710	0.9900
Al6	0.2030	0.4558	0.1875	0.5450	0.2617	0.1701	0.1777
Fe2	1.7791	1.6989	1.6341	1.4418	1.8648	1.6731	1.7709
Fe3	0.0000	0.0000	0.0000	0.2075	0.1328	0.0000	0.0000
Mg	3.0197	3.0427	3.2980	2.9283	2.7043	3.1548	3.0246
Mn	0.0385	0.0309	0.0342	0.0309	0.0349	0.0271	0.0398
Ti	0.2325	0.572	0.1509	0.0570	0.1133	0.1794	0.2130
Ca	1.6939	1.7085	1.7167	1.7898	1.9865	1.7538	1.7280
Na	0.4488	0.3854	0.3639	0.4663	0.0770	0.3639	0.4182
K	0.0596	0.0634	0.0608	0.0948	0.0244	0.0613	0.0599
QUADRILATERAL COMPONENT	15.48	15.44	15.42	15.56	15.10	15.38	15.43
NO	26.09	26.49	25.83	29.06	30.32	26.65	26.49
EN	46.51	47.17	49.80	47.54	41.24	47.93	46.36
FS	27.40	26.34	24.37	23.41	28.44	25.42	27.15
A-SITE	29.36	30.42	31.60	28.22	16.26	29.59	29.44
MAP4	2.06	0.41	0.34	0.00	0.60	3.21	3.13
AL4	67.57	69.17	69.06	71.78	83.74	67.20	67.43

APPENDIX 6: MICROPROBE ANALYSES OF AMPHIPOLES IN CAYMAN TROUGH PLUTONICS
PAGE 33

ANALYSIS	741-2-1	741-2-1	741-3-1	741-3-1	741-3-1	741-3-1	741-3-1
	3-11	3-12	1-1	1-2	3-3	3-4	3-5
SiO2	52.31	55.08	51.49	49.50	55.16	42.81	42.42
Al2O3	3.55	.76	3.96	5.78	1.04	12.39	12.40
FeO	12.44	16.90	9.78	10.15	4.43	7.38	7.97
Fe2O3	.65	.50	.58	1.72	.63	.71	.00
MgO	16.56	20.15	17.00	15.94	20.94	16.06	15.26
MnO	.25	.62	.14	.15	.11	.11	.10
TiO2	.78	.15	.94	.82	.08	2.80	3.19
CaO	11.18	1.45	12.08	11.95	12.59	11.87	11.87
Na2O	.74	.09	.52	.84	.20	2.07	2.09
K2O	.17	.33	.22	.25	.55	.67	.69
TOTAL	97.75	97.23	96.51	97.10	96.10	96.87	95.99

NO. OF IONS/Z3 OXYGENS

Si	7.4523	7.9301	7.9463	7.1814	7.7737	6.2360	6.2445
Al4	.5077	.0699	.5537	.8186	.2263	1.7640	1.7555
Alc	.0952	.0591	.1214	.1699	.0794	.3638	.3964
Fe2	1.4992	2.2757	1.1825	1.2312	.5218	.8995	.9812
Fe3	.0055	.0000	.0414	.1672	.0664	.0775	.0000
Mg	3.5596	4.3235	3.5639	3.4464	4.4004	3.4865	3.3478
Mn	.0305	.0756	.0171	.0184	.0107	.0136	.0125
Ti	.0845	.0162	.1022	.0895	.0655	.3067	.3532
Ca	1.7257	.2237	1.8719	1.8576	1.9012	1.8527	1.8723
Na	.2067	.0251	.1456	.2363	.0507	.5847	.5966
K	.0312	.0055	.0466	.0463	.0090	.1245	.1296
QUADRILATERAL COMPONENT	15.24	15.00	15.19	15.28	15.36	15.71	15.69

SiO	25.44	3.28	27.86	28.42	27.84	29.70	30.19
En	52.47	63.37	54.54	52.74	64.52	55.88	53.99
Fs	22.10	33.35	17.60	18.84	7.34	14.92	15.82
A-SITE	31.91	5.98	25.18	25.66	21.95	28.67	27.78
AM4	.00	24.98	.50	.00	.00	.00	1.48
AL4	66.09	69.54	74.82	74.34	78.05	71.33	70.74

APPENDIX 6. MICROPROBE ANALYSES OF AMPHIPOLES IN CAYMAN TROUGH PLUTONICS
PAGE 34

ANALYSIS	742-2-1	742-2-1	742-2-1	742-2-1	742-2-1	742-2-1	742-2-1
	3-1	3-2	2-3	2-4	2-5	2-1	3-3
SiO2	49.12	45.77	48.98	51.64	51.72	50.43	50.82
Al2O3	5.95	6.21	7.29	4.23	2.31	3.88	5.27
FeO	13.25	13.75	12.76	13.34	21.15	13.01	9.51
Fe2O3	.00	.00	.00	.00	.49	.55	.82
MgO	14.98	14.77	14.52	15.25	10.16	16.03	16.84
MnO	.23	.20	.40	.16	.20	.30	.20
TiO2	1.46	1.63	1.47	.77	.29	.92	.21
CaO	11.35	11.19	11.51	12.16	12.06	10.72	12.04
Na2O	1.50	1.40	1.19	.83	.33	1.01	1.02
K2O	.31	.28	.29	.26	.06	.21	.07
TOTAL	97.95	98.20	98.21	98.18	98.76	97.06	96.80

NO. OF IONS/23 OXYGENS

Si	7.1483	7.0913	7.0756	7.4563	7.6850	7.3717	7.3349
Al	.8517	.9087	.9244	.5437	.3150	.6283	.6651
Al6	.1519	.1559	.3171	.1418	.0877	.0404	.2316
Fe2	1.6126	1.6721	1.5416	1.5735	2.6290	1.5902	1.1477
Fe3	.0000	.0000	.0000	.0000	.0540	.0602	.0895
Mg	3.2272	3.2006	3.1260	3.2791	2.2499	3.4922	3.6223
Mn	.0204	.0246	.0245	.0196	.0252	.0371	.0245
Ti	.1598	.1782	.1597	.0836	.0324	.1011	.0228
Ca	1.7698	1.7434	1.7816	1.8799	1.9201	1.6791	1.8620
Na	.4233	.3947	.3334	.2321	.0951	.2863	.2854
K	.0576	.0519	.0534	.0479	.0114	.0392	.0129

CUPRILATERAL COMPONENT

WJ	15.43	15.42	15.34	15.26	15.11	15.33	15.30
EN	26.78	26.35	27.63	27.92	28.24	24.83	28.08
FS	46.83	48.38	46.47	48.71	33.09	51.65	54.62
A-SITE	32.31	31.10	25.73	31.25	25.26	34.12	30.97
NAH4	3.77	1.86	3.77	2.75	.00	.00	.00
AL4	63.92	67.65	70.50	66.00	74.74	65.88	69.03

APPENDIX B. MICROPROBE ANALYSES OF AMPHIROLES IN CAYMAN TROUGH PLUTONICS

PAGE 35

ANALYSIS	742-3-1	242-3-1	742-3-1	742-3-1	742-3-1	742-3-1	742-5-2
	4-4	1-5	1-6	5-7	5-8	5-9	3-1
SiO2	43.98	43.47	44.15	44.85	55.10	55.31	47.95
Al2O3	11.28	11.35	11.02	12.37	.39	.67	7.51
FeO	8.92	6.30	8.36	7.33	9.07	7.33	11.95
Fe2O3	.00	.00	.00	.23	.00	.82	1.16
MgO	15.22	15.63	15.79	17.10	18.06	18.97	14.24
MnO	.13	.12	.11	.11	.12	.16	.20
TiO2	2.63	2.97	2.53	1.11	.00	.00	.18
CaO	12.26	12.12	12.09	11.59	12.71	13.02	12.14
Na2O	2.28	2.49	2.32	2.58	.02	.07	1.46
K2O	.43	.40	.39	.32	.31	.03	.23
TOTAL	97.33	96.85	96.77	97.59	95.48	96.38	97.02

NO. OF IONS/23 OXYGENS

Si	6.4036	6.3492	6.4433	6.4336	7.9636	7.8865	7.0370
Al4	1.5994	1.6508	1.5597	1.5654	.0364	.1126	.9630
Al6	.3300	.3035	.3355	.5255	.0300	.0000	.3364
Fe2	1.0057	1.0139	1.0199	.8794	1.0963	.8745	1.4672
Fe3	.0000	.0000	.0000	.0252	.0000	.0878	.1288
Mg	3.3011	3.4023	3.4347	3.6557	3.8901	4.0312	3.1145
Mn	.0100	.0148	.0148	.0134	.0147	.0193	.0249
Ti	.3097	.3262	.2776	.1197	.0000	.0000	.0199
Ca	1.9118	1.9368	1.8897	1.7814	1.9683	1.9892	1.9090
Na	.6433	.7051	.6502	.7176	.0056	.0194	.4155
K	.0796	.0745	.0726	.0586	.0018	.0055	.0431

QUADRILATERAL COMPONENT

SiO2	30.35	30.05	29.60	28.20	26.30	28.85	29.41
Al2O3	52.41	53.89	54.12	57.88	55.93	58.47	47.98
FeO	17.24	16.06	15.08	13.92	15.76	12.68	22.60
A-SITE	29.43	30.33	30.54	33.13	15.75	18.05	30.26
NAKH	1.71	1.75	1.30	.00	1.24	.00	.00
AL4	68.66	67.92	68.15	60.87	83.02	81.95	67.74
QUADRILATERAL COMPONENT	15.64	15.74	15.70	15.78	15.01	15.03	15.46

APPENDIX C. MICROPROBE ANALYSES OF AMPHIBOLES IN CAYMAN TROUGH PLUTONICS
PAGE 36

ANALYSIS	742-5-2	742-5-2	742-5-2	742-5-2	742-5-2	742-5-2	742-5-2
SiO2	3-2	2-3	2-4	2-5	2-6	2-7	2-8
Al2O3	49.13	47.28	44.54	42.76	42.59	44.06	44.08
FeO	7.61	8.10	10.42	13.05	12.14	10.88	11.03
Fe2O3	11.79	12.79	12.20	8.98	9.48	10.16	10.03
MgO	1.16	.23	.00	.00	.00	.00	.00
MnO	14.47	14.06	13.32	15.12	14.55	14.71	14.66
TiO2	.16	.16	.11	.17	.14	.12	.14
CaO	.20	.75	1.66	3.27	3.39	2.37	2.41
Na2O	12.00	11.82	11.70	11.33	11.25	11.59	11.49
K2O	1.38	1.54	2.09	2.82	2.81	2.51	2.50
TOTAL	97.13	97.06	96.11	97.80	97.47	96.74	96.66

NO. OF IONS/23 OXYGENS

Si	7.0409	6.9517	6.6295	6.1949	6.2637	6.4746	6.4747
Al	.9591	1.0483	1.3705	1.8051	1.7363	1.5254	1.5253
Alc	.3534	.3558	.4500	.4238	.3470	.3595	.3847
Fe	1.0423	1.5729	1.5187	1.0880	1.1552	1.2486	1.2321
Fe3	.1274	.0257	.0000	.0000	.0000	.0000	.0000
Mg	3.1547	3.0009	2.8904	3.2646	3.2463	3.2216	3.2092
Mn	.0198	.7199	.0214	.0135	.0173	.0149	.0174
Ti	.0240	.0829	.1458	.3563	.3715	.2619	.2662
Ca	1.8810	1.8622	1.8680	1.7588	1.7563	1.8249	1.8084
Na	.2914	.4390	.6032	.7922	.7939	.7152	.7120
K	.0429	.0619	.0570	.0665	.0595	.0637	.0600
QUADRILATELAL COMPONENT	15.43	15.50	15.60	15.76	15.75	15.71	15.69
AO	29.04	29.58	29.74	28.78	28.52	28.99	28.94
EM	48.70	47.28	46.26	53.92	52.72	51.18	51.35
FS	22.26	24.14	24.20	17.80	18.76	19.84	19.71
A-SITE	31.17	32.34	29.57	28.67	28.92	30.83	30.04
AM4	.00	.00	2.94	3.57	4.03	2.97	3.57
AL4	66.83	67.66	67.49	67.76	67.05	66.20	66.40