

Table 1. Synthetic petrographic description and modal proportion (% volume) of major phases of A. Sulu basement rocks (Site 768) and B. Cagayan Ridge volcanics (Sites 769, 771). Brackets indicate highly or totally replaced phases. Amount of secondary minerals refer to percentage over bulk rock, and also include amygdale and vein fillings.

Hole Core-Sec. Int. (cm)	Rock type	Unit	Texture	Phenocrysts & microph.	Groundmass	Secondary minerals	Comment
768C 73R-1 124-127	Pieritic basalt	1	highly phyrlic, intersertal	(ol14)	pl43, cpx17, op4, (gl22)	carb, clay, tc, id, smt, ox (66%)	ves30 hu
768C 74R-1 14-16	Pieritic basalt	1	highly phyrlic, intersertal	(ol19), sp1	pl26, cpx13, op4, (gl37)	serp, smt, ox, (76%)	ves20 hu
768C 74R-1 127-129	Basalt	1	highly phyrlic, intersertal	(ol11)	pl31, cpx9, op3, (ol1), (gl45)	carb, id, serp, zeol, smt, ox (83%)	ves27, v10 hu
768C 75R-2 48-50	Basalt	1	oligo phyrlic, intersertal	(ol6), cpx2	pl29, cpx14, op4, (gl46)	carb, serp, tc, ox id, zeol, smt (82%)	ves30 hu
768C 77R-2 81-83	Pieritic basalt	1	highly phyrlic, hyalopilitic	(ol19), sp1	pl16, cpx6, op1, (gl57)	serp, smt, ox (96%)	ves20 hu
768C 78R-2 114-116	Basalt	1	oligo phyrlic, vitrophyric	(ol9)	pl10, cpx9, gl72	serp, smt (88%)	ves7 vhu
768C 81R-2 33-34	Basalt	1	highly phyrlic intersertal	(ol12)	pl27, cpx8, op5, (ol5), (gl43)	serp, tc, id, smt (75%)	ves15 hu
768C 89R-4 12-15	Dolerite	2	subophitic		pl54, cpx18, op5, (ol10), (gl13)	carb, serp smt, zeol (26%)	ves3 ma
768C 89R-4 108-111	Dolerite	2	subophitic		pl48, cpx23, opx2 op3, (ol10), (gl14)	serp, carb, chl act, smt (24%)	ma
768C 90R-1 38-41	Dolerite	2	subophitic		pl52, cpx27, opx2 op5, (ol5), (gl9)	serp, smt zeol (14%)	ves5 ma
768C 90R-3 58-59	Dolerite	2	subophitic, intersertal		pl55, cpx20, op5, (ol5), (gl15)	chl, act, smt (20%)	ma
768C 91R-2 104-107	Dolerite	2	subophitic, intersertal		pl55, cpx27, op5, (ol10), (gl3)	smt, serp, id (13%)	sa
768C 92R-1 61-65	Microgabbro	3	subophitic		pl43, cpx20, op5, (ol10), opx15 (bt1), (meso6)	serp, tc, chl, smt, act (20%)	ma
768C 93R-1 115-116	Microgabbro	3	subophitic		pl60, cpx20, opx17, op1, (bt2)	serp, chl, act (10%)	sa
768C 93R-3 77-78	Microgabbro	3	subophitic		pl54, cpx22, op2, (ol12), opx4, (bt6)	serp, chl, act (20%)	ma
768C 94R-1 74-77	Microgabbro	3	subophitic		pl55, cpx30, op2, opx5, (meso8)	serp, cp smt (13%)	ma
768C 95R-1 30-33	Basalt	4	aphyrlic, intersertal		pl45, cpx25, (gl30)	serp, smt, ox, (55%)	ves25 ma
768C 96R-3 126-129	Basalt	4	aphyrlic, subophitic		pl54, cpx30, op1, (ol10), (gl5)	serp, smt, ab (15%)	ves5 ma
768C 96R-3 129-134	Basalt	4	aphyrlic, hyalopilitic		pl45, cpx30, op5 (ol10), (gl10)	serp, smt (30%)	ves10 ma
768C 97R-3 55-59	Basalt	4	aphyrlic, intergranular		pl30, cpx40, op5 (ol5), (gl20)	carb, serp, zeol, clay, smt (45%)	ves20 ma
768C 98R-3 68-69	Basalt	5	oligo phyrlic, intergranular	(ol5)	pl20, cpx20, op5 (ol6), (gl44)	serp, id, ab smt (55%)	ves5 hu
768C 99R-4 43-49	Basalt	6	aphyrlic, hyalopilitic	(ol<1)	pl20, cpx10, op5 (gl65)	serp, smt, ox, (65%)	ves29 hu
768C	Basalt	7	oligo phyrlic,	(ol4)	pl19, cpx10,	rp, tc, zeol	ves30

Table 1 (continued).

Hole Core-Sec. Int. (cm)	Rock type	Unit	Texture	Phenocrysts & microph.	Groundmass	Secondary minerals	Comment
100R-1 34-35			hyalopillitic		(gl67)	clay, smt, ox (84%)	ha
768C 100R-1 37-41	Basalt	7	oligo phyric, vitrophyric	(ol3)	(gl97) ⁰	serp, id, smt ox, (85%)	ves30 vha
768C 100R-2 17-19	Basalt	8	aphyric intergranular		pl46, cpx28, op10, gl16	carb, zeol smt (26%)	ves10 ma
B							
769B 31X-CC 26-29	CA-basaltic andesite	3	highly phyric intersertal, hyalopillitic	pl28, cpx4, (ol6), op2	pl18, cpx9, op3, (gl30) (60%)	smt, carb, ox, id, cha (36%)	ves4 ma
769B 32X-CC 9-12	CA-basalt	3	highly phyric intersertal	pl6, cpx4 (ol1)	pl52, cpx20, op3, gl14 (89%)	id, smt, cha (17%)	ves16, sa
769C 3R-2 41-43	Th-basalt	3	highly phyric intersertal	pl25, cpx6 (ol4)	pl30, cpx12, op3, (gl15), ap (65%)	smt, ox, carb, id (24%)	ves5 ma
769C 4R-5 9-15	CA-basalt	3	highly phyric intersertal	pl15, (ol10), cpx2	pl34, cpx20, op5, (ol4), (gl10) ap (73%)	smt, ox, carb, id (28%)	ves4 ma
769C 5R-5 22-25	CA-basaltic andesite	3	highly phyric hyalopillitic	pl30, cpx7 op3	pl40, cpx2, op3, (gl15), ap (60%)	smt (18%)	ves1 ma
769C 7R-1 108-112	CA-andesite	3	highly phyric hyalopillitic	pl30, cpx10, (ol2), opx1, op4	pl13, cpx3, op2, gl35, ap (53%)	clay, ox id (4%)	ves2 f
769C 9R-3 121-122	CA-andesite	3	highly phyric hyalopillitic	pl26, cpx8 opx8, op4 (ol1)	pl8, cpx3, op2, gl40, ap, (53%)	smt, ox (4%)	ves2 f
769C 9R-4 46-49	CA-basaltic andesite	3	highly phyric hyalopillitic	pl35, cpx8, (ol6), op3	pl15, cpx2, op2, gl29 (48%)	smt, carb, ox cha, id (9%)	ves1 sa
769C 12R-5 114-117	CA-basaltic andesite	3	highly phyric hyalopillitic	pl30, cpx8 (ol5), opx1 op1	pl13, cpx3, op2, (ol2), gl35 (55%)	smt, id (12%)	ves4 sa
771A 11R-3 13-16	Th-basalt	2	oligo phyric intersertal	cpx4	pl43, cpx22, op4, (gl25) (96%)	smt (27%)	ves2 ma
771A 15R-3 69-72	Th-basalt	2	highly phyric intersertal	pl20, cpx5 (ol5)	pl3, (gl67) (70%)	smt, cha (77%)	ves5 ha
771A 17R-2 108-111	Th-basalt	2	highly phyric hyalopillitic	pl22, (ol5), cpx2	pl9, cpx7, op (gl55), (71%)	id, smt, cha, zeol (70%)	ves10 ha
771A 18R-3 129-132	Th-basalt	2	oligo phyric hyalopillitic	(ol3), cpx3	pl32, cpx11, op3, (ol2), (gl46) (94%)	id, smt, ox (51%)	ves2 ha
771A 18R-7 120-124	Th-basalt	2	highly phyric hyalopillitic	pl30, cpx5, (ol3)	pl5, cpx6, op1, (gl50), (62%)	smt, cha, id zeol (55%)	ves2 ha
771A 18R-7 142-144	Th-basalt	2	highly phyric intersertal	pl30, (ol6) cpx6	pl10, cpx5, op3, gl40, (58%)	id, smt, cha zeol (9%)	ves3 sa
771A 18R-8 21-23	Th-basalt	2	highly phyric hyalopillitic	pl15, (ol4) cpx2, op1	pl30, cpx10, (ol10), op4, (gl24), (78%)	id, smt (43%)	ves5 ha

Abbreviations: ol, olivine; cpx, clinopyroxene; opx, orthopyroxene; pl, plagioclase; sp, spinel; gl, glass; bt, biotite; chl, chlorite; clay, clay minerals; tc, talc; carb, carbonate; id, iddingsite; smt, smectite; serp, serpentine; act, actinolite; zeol, zeolite; ox, iron oxides and hydroxides; ep, epidote; ab, albite; cha, chalcidony meso, mesostasis; ves, vesicles; v, veins. sa, slightly altered (2%-10% alteration); ma, moderately altered (10%-40% alteration); ha, highly altered (40%-80% alteration); vha, very highly altered (80%-95% alteration).

Table 2. Representative microprobe analyses (wt% oxide) and atomic proportions of pyroxenes from A. Sulu basement rocks and B. Cagayan Ridge volcanics. Fe³⁺/Fe²⁺ partitioning according to Papike et al., 1974.

A															
Hole 768C															
Core-Section Interval (cm)	Unit 1		Unit 2						Unit 3						
	73R-1 124-127	74R-1 14-16	75R-2 48-50	77R-2 81-83	89R-4 9-12	90R-3 58-59	91R-2 104-107	92R-1 61-65							
	g	g	g	g	g	Ac	Ar	Ac	Ar	Ac	Ar	Ac	Ar	Bc	Br
SiO ₂	52.60	47.28	52.31	51.38	47.06	52.55	52.42	51.78	51.83	52.39	49.96	52.15	51.88	52.89	52.35
TiO ₂	0.30	1.41	0.37	0.59	1.25	0.50	0.57	0.73	0.81	0.32	1.07	0.61	1.13	0.45	0.71
Al ₂ O ₃	2.29	10.56	2.70	4.25	9.61	3.01	3.10	3.02	2.40	2.02	1.85	2.53	2.12	1.73	1.42
Fe ₂ O ₃	1.04	0.88	1.24	0.68	1.68	1.71	1.78	1.74	1.80	1.94	0.94	0.64	0.11	0.30	1.10
FeO	4.29	5.71	3.91	4.67	4.24	3.36	4.13	5.88	7.82	2.58	15.12	4.91	7.53	5.07	7.33
MnO	0.16	0.14	0.15	0.16	0.15	0.11	0.16	0.18	0.27	0.12	0.45	0.15	0.23	0.19	0.22
MgO	19.63	12.93	18.45	17.24	13.97	17.47	17.97	16.55	15.99	17.84	12.18	16.88	16.07	17.65	16.23
CaO	18.20	21.77	19.92	19.78	20.82	21.70	20.22	20.40	19.55	21.51	17.45	21.09	19.75	20.33	19.51
Na ₂ O	0.09	0.22	0.09	0.23	0.31	0.19	0.21	0.19	0.23	0.19	0.23	0.16	0.29	0.19	0.38
NiO	0.00	0.02	0.01	0.08	0.05	0.02	0.00	0.02	0.00	0.05	0.04	0.04	0.04	0.03	0.00
Cr ₂ O ₃	0.65	0.09	0.37	0.31	0.09	0.40	0.24	0.09	0.01	0.56	0.05	0.41	0.06	0.29	0.00
Total	99.25	101.01	99.52	99.37	99.23	101.02	100.80	100.58	100.71	99.52	99.34	99.57	99.21	99.12	99.25
Si	1.922	1.728	1.912	1.885	1.742	1.900	1.899	1.896	1.909	1.919	1.921	1.919	1.930	1.948	1.947
Ti	0.008	0.039	0.010	0.016	0.035	0.014	0.016	0.020	0.022	0.009	0.031	0.017	0.032	0.013	0.020
Al	0.099	0.455	0.116	0.184	0.419	0.128	0.132	0.130	0.104	0.087	0.084	0.110	0.093	0.075	0.062
Fe ³⁺	0.029	0.024	0.034	0.019	0.047	0.047	0.049	0.048	0.050	0.054	0.027	0.018	0.003	0.008	0.031
Fe ²⁺	0.131	0.175	0.120	0.143	0.131	0.102	0.125	0.180	0.241	0.079	0.486	0.151	0.234	0.156	0.228
Mn	0.005	0.004	0.005	0.005	0.005	0.003	0.005	0.006	0.008	0.004	0.015	0.005	0.007	0.006	0.007
Mg	1.069	0.704	1.005	0.943	0.771	0.941	0.970	0.903	0.878	0.974	0.698	0.926	0.891	0.969	0.900
Ca	0.713	0.853	0.780	0.778	0.826	0.841	0.785	0.800	0.771	0.844	0.719	0.831	0.787	0.802	0.778
Na	0.006	0.016	0.006	0.016	0.022	0.013	0.015	0.014	0.016	0.014	0.017	0.011	0.021	0.014	0.027
Ni	0.000	0.001	0.000	0.002	0.002	0.001	0.000	0.001	0.000	0.002	0.001	0.001	0.001	0.001	0.000
Cr	0.019	0.003	0.011	0.009	0.003	0.011	0.007	0.003	0.000	0.016	0.002	0.012	0.002	0.008	0.000
B															
Hole 769C															
Core-Section Interval (cm)	Unit 3						Unit 4				Unit 5				
	93R-1 115-116		93R-3 77-78		94R-1 74-77		96R-3 129-134		97R-3 55-59		98R-3 68-69				
	Ac	Bc	Br	Ar	B	Ac	Ar	g	g	g	g	g	g	g	g
SiO ₂	53.49	53.85	51.55	53.06	51.83	53.44	51.08	51.39	50.60	49.33	50.33	50.34	47.75	49.06	48.35
TiO ₂	0.72	0.56	0.75	0.38	1.06	0.61	0.66	0.87	0.82	1.43	1.22	1.23	2.09	1.51	1.64
Al ₂ O ₃	1.60	1.18	3.15	2.03	2.24	1.45	4.13	2.89	4.42	5.47	3.61	4.35	6.68	6.18	6.26
Fe ₂ O ₃	0.10	0.34	1.54	0.70	0.92	0.53	1.05	0.92	1.44	1.94	1.77	0.98	1.96	1.61	1.73
FeO	13.98	14.44	4.55	4.52	7.78	14.26	4.21	8.88	6.27	6.40	9.60	8.30	6.48	6.53	6.38
MnO	0.38	0.37	0.18	0.13	0.25	0.36	0.15	0.37	0.19	0.17	0.35	0.22	0.16	0.16	0.14
MgO	26.90	26.75	16.91	18.52	16.77	26.44	17.12	17.42	16.54	15.52	14.76	14.86	13.14	14.26	13.36
CaO	1.80	1.88	20.59	19.49	18.58	2.11	20.01	16.03	18.48	19.06	18.77	19.69	21.52	20.96	21.52
Na ₂ O	0.00	0.00	0.23	0.25	0.26	0.00	0.25	0.30	0.35	0.35	0.21	0.23	0.29	0.23	0.30
NiO	0.04	0.02	0.01	0.02	0.04	0.12	0.00	0.04	0.03	0.05	0.00	0.05	0.00	0.00	0.04
Cr ₂ O ₃	0.02	0.02	0.70	0.45	0.04	0.01	0.62	0.12	0.14	0.14	0.05	0.15	0.10	0.17	0.10
Total	99.03	99.41	100.16	99.55	99.77	99.33	99.28	99.23	99.28	99.86	100.67	100.40	100.17	100.67	99.82

Table 2 (continued).

	1.944	1.954	1.888	1.938	1.917	1.944	1.878	1.908	1.871	1.824	1.869	1.863	1.777	1.807	1.801	
Si	0.020	0.015	0.021	0.010	0.030	0.017	0.018	0.024	0.023	0.040	0.034	0.034	0.059	0.042	0.046	
Ti	0.069	0.051	0.136	0.087	0.098	0.062	0.179	0.127	0.193	0.238	0.158	0.190	0.293	0.268	0.275	
Al	0.003	0.009	0.042	0.019	0.026	0.015	0.029	0.026	0.040	0.054	0.050	0.027	0.055	0.045	0.049	
Fe ³⁺	0.425	0.438	0.139	0.138	0.241	0.434	0.129	0.276	0.194	0.198	0.298	0.257	0.202	0.201	0.199	
Fe ²⁺	0.012	0.011	0.006	0.004	0.008	0.011	0.005	0.012	0.006	0.005	0.011	0.007	0.005	0.005	0.004	
Mn	1.457	1.447	0.923	1.008	0.925	1.433	0.938	0.964	0.912	0.855	0.817	0.820	0.729	0.783	0.742	
Mg	0.070	0.073	0.808	0.763	0.736	0.082	0.788	0.638	0.732	0.755	0.747	0.781	0.858	0.827	0.859	
Ca	0.000	0.000	0.016	0.018	0.019	0.000	0.018	0.022	0.025	0.025	0.015	0.017	0.021	0.016	0.022	
Na	0.001	0.001	0.000	0.001	0.001	0.004	0.000	0.001	0.001	0.002	0.000	0.002	0.000	0.000	0.001	
Ni	0.001	0.001	0.020	0.013	0.001	0.000	0.018	0.004	0.004	0.004	0.002	0.004	0.003	0.005	0.003	
Cr																
	Hole 769B							Hole 769C								
	Unit 3							Unit 3								
Core-Section	31X-CC			32X-CC				3R-2		4R-5		5R-5		7R-1		9R-3
Interval (cm)	26-29			9-12				41-43		9-15		22-25		108-112		121-122
	Ac	Ar	Bc	Ac	Ar	Bc	Br	Ac	Ar	Ac	Ar	Ac	Ar	Ac	Ac	
SiO ₂	50.28	50.49	52.64	51.84	51.92	50.42	53.62	53.19	53.21	51.90	50.61	51.88	51.32	52.32	52.00	
TiO ₂	0.80	0.69	0.46	0.59	0.62	1.16	0.44	0.30	0.27	0.63	1.24	0.29	0.40	0.38	0.37	
Al ₂ O ₃	5.30	3.84	1.41	3.58	3.42	4.93	2.03	2.10	1.99	2.87	4.55	1.07	1.47	2.24	1.76	
Fe ₂ O ₃	1.97	1.90	1.57	1.42	1.04	1.23	0.69	1.01	0.83	2.35	1.89	1.88	2.35	0.75	2.28	
FeO	5.23	8.21	7.61	3.64	4.19	4.76	4.59	5.98	5.99	3.89	5.72	7.80	7.72	4.86	6.71	
MnO	0.17	0.27	0.52	0.11	0.14	0.12	0.16	0.18	0.19	0.19	0.18	0.52	0.43	0.17	0.36	
MgO	15.66	14.93	15.53	16.53	16.40	15.83	18.10	17.78	17.68	17.05	15.33	14.60	14.29	16.59	15.59	
CaO	20.69	19.28	20.56	21.97	21.90	21.28	20.78	19.55	19.78	20.82	20.98	20.94	20.95	21.37	20.57	
Na ₂ O	0.22	0.26	0.26	0.25	0.22	0.21	0.19	0.21	0.18	0.32	0.33	0.31	0.33	0.20	0.28	
NiO	0.00	0.01	0.06	0.00	0.00	0.02	0.04	0.03	0.00	0.02	0.04	0.00	0.01	0.05	0.03	
Cr ₂ O ₃	0.31	0.01	0.01	0.54	0.42	0.27	0.25	0.17	0.03	0.44	0.08	0.01	0.00	0.27	0.11	
Total	100.63	99.89	100.63	100.47	100.27	100.23	100.89	100.50	100.15	100.48	100.95	99.30	99.27	99.20	100.06	
Si	1.840	1.879	1.943	1.889	1.897	1.848	1.938	1.938	1.944	1.894	1.852	1.949	1.932	1.933	1.928	
Ti	0.022	0.019	0.013	0.016	0.017	0.032	0.012	0.008	0.007	0.017	0.034	0.008	0.011	0.011	0.010	
Al	0.229	0.168	0.061	0.154	0.147	0.213	0.087	0.090	0.086	0.123	0.196	0.047	0.065	0.098	0.077	
Fe ³⁺	0.054	0.053	0.044	0.039	0.029	0.034	0.019	0.028	0.023	0.065	0.052	0.053	0.067	0.021	0.064	
Fe ²⁺	0.160	0.256	0.235	0.111	0.128	0.146	0.139	0.182	0.183	0.119	0.175	0.245	0.243	0.150	0.208	
Mn	0.005	0.009	0.016	0.003	0.004	0.004	0.005	0.006	0.006	0.006	0.006	0.017	0.014	0.005	0.011	
Mg	0.854	0.828	0.854	0.898	0.893	0.865	0.975	0.965	0.963	0.927	0.836	0.818	0.802	0.913	0.861	
Ca	0.811	0.769	0.813	0.858	0.857	0.836	0.805	0.763	0.774	0.814	0.823	0.843	0.845	0.846	0.817	
Na	0.016	0.019	0.019	0.018	0.016	0.015	0.013	0.015	0.013	0.023	0.023	0.023	0.024	0.014	0.020	
Ni	0.000	0.000	0.002	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	
Cr	0.009	0.000	0.000	0.016	0.012	0.008	0.007	0.005	0.001	0.013	0.002	0.000	0.000	0.008	0.003	

Table 2 (continued).

Hole 769C															
Unit 3															
Core-Section Interval (cm)	9R-3 121-122							9R-4 46-49			12R-5 114-117				
	Ar	Bc	Br	Cc	Dc	Dr	Er	Ac	Ar	Bc	Br	ph	ph	mph	mph
SiO ₂	52.03	52.84	53.04	53.29	53.15	52.90	52.60	50.24	51.42	50.64	50.76	52.13	51.49	51.33	51.69
TiO ₂	0.49	0.26	0.17	0.22	0.23	0.19	0.36	0.80	0.65	0.23	0.89	0.70	0.82	0.84	0.75
Al ₂ O ₃	3.40	0.70	0.52	0.66	0.74	0.56	1.22	4.72	3.14	4.22	3.33	2.35	2.94	2.88	2.55
Fe ₂ O ₃	0.16	0.58	0.47	0.59	0.56	0.46	0.46	2.24	1.43	2.69	2.27	1.96	2.14	2.01	1.77
FeO	9.93	19.52	19.76	19.43	19.62	20.77	20.37	5.36	6.89	1.74	7.70	5.67	5.40	5.53	6.65
MnO	0.40	0.93	0.96	0.95	0.92	1.01	0.99	0.22	0.23	0.10	0.34	0.23	0.23	0.22	0.25
MgO	14.08	23.38	23.27	23.72	23.29	22.45	22.32	15.74	15.84	16.48	14.61	16.87	16.65	16.47	16.15
CaO	19.95	1.32	1.28	1.36	1.33	1.27	1.40	20.37	20.06	22.56	20.35	20.20	19.95	20.12	19.87
Na ₂ O	0.36	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.22	0.14	0.29	0.24	0.31	0.27	0.29
NiO	0.00	0.00	0.02	0.04	0.03	0.00	0.01	0.03	0.00	0.04	0.00	0.01	0.01	0.04	0.02
Cr ₂ O ₃	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.05	0.80	0.00	0.05	0.38	0.37	0.00
Total	100.80	99.53	99.49	100.26	99.87	99.61	99.79	100.16	99.93	99.64	100.54	100.41	100.32	100.08	99.99
Si	1.923	1.965	1.974	1.966	1.969	1.976	1.959	1.849	1.901	1.858	1.881	1.911	1.890	1.890	1.909
Ti	0.014	0.007	0.005	0.006	0.006	0.005	0.010	0.022	0.018	0.006	0.025	0.019	0.023	0.023	0.021
Al	0.148	0.031	0.023	0.029	0.032	0.025	0.054	0.205	0.137	0.183	0.146	0.102	0.127	0.125	0.111
Fe ³⁺	0.005	0.016	0.013	0.016	0.016	0.013	0.013	0.062	0.040	0.074	0.063	0.054	0.059	0.056	0.049
Fe ²⁺	0.307	0.607	0.615	0.600	0.608	0.649	0.634	0.165	0.213	0.053	0.239	0.174	0.166	0.170	0.205
Mn	0.013	0.029	0.030	0.030	0.029	0.032	0.031	0.007	0.007	0.003	0.011	0.007	0.007	0.007	0.008
Mg	0.776	1.296	1.291	1.304	1.286	1.250	1.239	0.863	0.873	0.901	0.807	0.722	0.911	0.904	0.889
Ca	0.790	0.053	0.051	0.054	0.053	0.051	0.056	0.803	0.795	0.887	0.808	0.793	0.785	0.794	0.786
Na	0.026	0.000	0.000	0.000	0.000	0.000	0.004	0.016	0.016	0.010	0.021	0.017	0.022	0.019	0.021
Ni	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.001
Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.002	0.023	0.000	0.001	0.011	0.011	0.000

Abbreviations: A, B, C, D, E mean different crystals; c, m and r, crystal core, middle, and rim, respectively; g, crystal in the groundmass; ph, phenocryst; mph, microphenocryst.

Table 3. Representative microprobe analyses (wt % oxide) and atomic proportions of plagioclases from A. Sulu basement rocks and B. Cagayan Ridge volcanics. Abbreviations as in Table 2.

		A																
		Hole 768C				Unit 2				Unit 3				Unit 3				
Core-Section Interval (cm)	Unit 1	74R-1	75R-2	77R-2	81R-2	89R-4	90R-3	91R-2	92R-1	73R-1	74R-1	75R-2	77R-2	81R-2	89R-4	90R-3	91R-2	92R-1
	124-127	14-16	48-50	81-83	33-34	108-111	58-59	104-107	61-65	g	g	g	g	g	Ac	Ar	Ac	Ar
SiO ₂	51.21	51.84	51.98	50.44	51.46	51.29	53.68	49.90	57.58	52.14	60.18	47.20	53.19	48.08	58.08			
TiO ₂	0.07	0.04	0.04	0.05	0.06	0.08	0.07	0.02	0.06	0.05	0.05	0.01	0.06	0.04	0.07			
Al ₂ O ₃	29.31	29.78	29.32	30.14	29.18	29.60	27.30	31.31	25.86	29.64	24.55	32.18	28.55	32.76	26.40			
Fe ₂ O ₃	1.11	70.94	0.98	0.79	0.98	1.02	0.77	0.66	0.71	0.74	0.64	0.58	0.81	0.59	0.64			
MnO	0.00	0.00	0.00	0.01	0.01	0.02	0.00	0.02	0.02	0.00	0.02	0.00	0.00	0.00	0.02			
MgO	0.41	0.28	0.35	0.45	0.39	0.23	0.35	0.19	0.03	0.10	0.01	0.17	0.13	0.14	0.07			
CaO	13.75	13.64	13.37	14.49	13.36	12.28	12.95	14.83	8.31	13.19	6.20	17.73	12.85	16.02	8.23			
Na ₂ O	3.10	3.55	3.85	3.09	3.57	4.41	4.03	3.17	6.98	4.11	8.21	1.31	4.19	2.17	7.00			
K ₂ O	0.12	0.08	0.08	0.07	0.06	0.07	0.05	0.04	0.11	0.03	0.16	0.02	0.04	0.01	0.15			
Total	99.08	100.15	99.97	99.53	99.07	99.00	99.20	100.14	99.66	100.00	100.02	99.20	99.82	99.81	100.66			
Si	2.354	2.357	2.368	2.314	2.365	2.358	2.455	2.278	2.594	2.372	2.685	2.189	2.419	2.207	2.589			
Ti	0.002	0.001	0.001	0.002	0.002	0.003	0.002	0.001	0.002	0.002	0.002	0.000	0.002	0.001	0.002			
Al	1.588	1.596	1.575	1.630	1.580	1.604	1.472	1.685	1.373	1.589	1.291	1.759	1.530	1.772	1.387			
Fe ³⁺	0.038	0.032	0.034	0.027	0.034	0.035	0.027	0.023	0.024	0.025	0.022	0.020	0.028	0.020	0.022			
Mn	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.001			
Mg	0.028	0.019	0.024	0.031	0.027	0.016	0.024	0.013	0.002	0.007	0.001	0.012	0.009	0.010	0.005			
Ca	0.677	0.664	0.653	0.712	0.658	0.605	0.635	0.726	0.401	0.643	0.296	0.881	0.626	0.788	0.393			
Na	0.276	0.313	0.340	0.275	0.318	0.393	0.357	0.281	0.610	0.363	0.710	0.118	0.370	0.193	0.605			
K	0.007	0.005	0.005	0.004	0.004	0.004	0.003	0.002	0.006	0.002	0.009	0.001	0.002	0.001	0.009			
		Hole 768C				Unit 4				Unit 5				Unit 6				
Core-Section Interval (cm)	Unit 3	93R-3	94R-1	96R-3	97R-3	98R-3	99R-3	100R-1	93R-1	93R-3	94R-1	96R-3	97R-3	98R-3	100R-1			
	115-116	77-78	74-77	126-129	55-59	68-69	34-35	g	Ac	Ac	Ar	Ac	Ar	g	g			
SiO ₂	50.42	46.38	58.75	53.23	63.42	54.80	52.90	51.66	55.22	51.32	48.44	53.23	68.33	52.52	53.71			
TiO ₂	0.02	0.04	0.09	0.06	0.05	0.09	0.05	0.07	0.08	0.04	0.00	0.00	0.00	0.08	0.08			
Al ₂ O ₃	31.27	33.33	25.20	29.27	22.40	27.00	28.30	30.12	27.74	30.74	33.42	29.27	19.63	28.31	27.57			
Fe ₂ O ₃	0.56	0.53	0.65	0.69	0.53	0.91	0.80	0.99	1.05	0.68	0.08	0.09	0.14	0.93	0.88			
MnO	0.00	0.00	0.02	0.01	0.03	0.02	0.00	0.04	0.04	0.00	0.02	0.00	0.00	0.01	0.02			
MgO	0.30	0.26	0.04	0.17	0.08	0.15	0.24	0.25	0.09	0.29	0.07	0.04	0.00	0.38	0.32			
CaO	15.62	17.48	6.52	12.18	4.62	10.56	12.23	13.62	10.43	14.66	13.42	11.88	0.23	13.50	12.15			
Na ₂ O	2.77	1.50	7.67	4.47	8.68	5.55	4.46	3.52	5.44	3.05	3.56	4.86	11.90	3.51	4.28			
K ₂ O	0.03	0.05	0.25	0.05	0.29	0.08	0.06	0.04	0.08	0.04	0.00	0.01	0.03	0.04	0.05			
Total	100.99	99.57	99.19	100.13	100.10	99.16	99.04	100.31	100.17	100.82	99.01	99.38	100.26	99.28	99.06			
Si	2.283	2.145	2.647	2.409	2.806	2.498	2.423	2.345	2.489	2.320	2.227	2.422	2.982	2.405	2.456			
Ti	0.001	0.001	0.003	0.002	0.002	0.003	0.002	0.002	0.003	0.001	0.000	0.000	0.000	0.003	0.003			
Al	1.669	1.817	1.338	1.562	1.168	1.451	1.528	1.612	1.474	1.638	1.811	1.570	1.010	1.528	1.486			
Fe ³⁺	0.019	0.018	0.022	0.024	0.018	0.031	0.028	0.034	0.036	0.023	0.003	0.003	0.005	0.032	0.030			
Mn	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.002	0.002	0.000	0.001	0.000	0.000	0.000	0.001			
Mg	0.020	0.018	0.003	0.012	0.005	0.010	0.016	0.017	0.006	0.020	0.005	0.003	0.000	0.026	0.022			
Ca	0.758	0.866	0.315	0.591	0.219	0.516	0.600	0.663	0.504	0.710	0.661	0.579	0.011	0.662	0.595			
Na	0.243	0.135	0.670	0.392	0.745	0.491	0.396	0.310	0.476	0.267	0.317	0.429	1.007	0.312	0.379			
K	0.002	0.003	0.014	0.003	0.016	0.005	0.004	0.002	0.005	0.002	0.000	0.001	0.002	0.002	0.003			

Table 3 (continued).

B																
Hole 769B					Hole 769C											
Core-Section Interval (cm)	Unit 3				32X-CC 9-12				Unit 3				4R-5 9-15		5R-5 22-25	
	31X-CC 26-29								3R-2 41-43							
	Ac	Ar	Bc	Br	Ac	Bc	Bm	Br	Ac	Am	Ar	Ac	Ar	Bc	Br	
SiO ₂	55.60	57.19	56.28	55.86	46.22	46.69	47.56	49.02	48.47	48.89	47.61	50.55	51.83	46.90	51.23	
TiO ₂	0.02	0.02	0.06	0.04	0.02	0.02	0.04	0.04	0.02	0.01	0.03	0.09	0.05	0.02	0.03	
Al ₂ O ₃	27.92	26.70	27.70	27.85	33.20	33.87	33.02	32.48	32.53	32.32	33.36	29.94	30.45	33.00	29.85	
Fe ₂ O ₃	0.58	0.55	0.57	0.60	0.91	0.58	0.57	0.63	0.67	0.65	0.76	0.72	0.73	0.54	0.67	
MnO	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.03	0.00	0.01	0.00	
MgO	0.06	0.08	0.08	0.03	0.27	0.15	0.23	0.22	0.17	0.18	0.16	0.20	0.22	0.06	0.09	
CaO	10.68	9.42	10.35	10.84	16.87	17.59	16.75	16.01	16.02	15.78	17.10	15.25	13.78	17.62	13.46	
Na ₂ O	5.29	5.87	5.43	5.22	1.34	1.41	1.83	2.23	2.20	2.23	1.71	2.25	3.54	1.33	3.66	
K ₂ O	0.23	0.33	0.25	0.25	0.30	0.06	0.10	0.12	0.10	0.01	0.06	0.67	0.17	0.04	0.12	
Total	100.38	100.18	100.73	100.69	99.13	100.37	100.10	100.76	100.18	100.08	100.80	99.70	100.77	99.52	99.11	
Si	2.498	2.565	2.517	2.502	2.148	2.141	2.183	2.229	2.218	2.235	2.172	2.321	2.342	2.168	2.352	
Ti	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.003	0.002	0.001	0.001	
Al	1.479	1.412	1.460	1.471	1.818	1.831	1.786	1.741	1.754	1.741	1.794	1.620	1.622	1.798	1.616	
Fe ³⁺	0.020	0.019	0.019	0.020	0.032	0.020	0.020	0.022	0.023	0.022	0.026	0.025	0.025	0.019	0.023	
Mn	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	
Mg	0.004	0.005	0.005	0.002	0.019	0.010	0.016	0.015	0.012	0.012	0.011	0.014	0.015	0.004	0.006	
Ca	0.514	0.453	0.496	0.520	0.840	0.865	0.824	0.780	0.785	0.773	0.836	0.750	0.667	0.873	0.662	
Na	0.461	0.511	0.471	0.453	0.121	0.125	0.163	0.197	0.195	0.198	0.151	0.200	0.310	0.119	0.326	
K	0.013	0.019	0.014	0.014	0.018	0.004	0.006	0.007	0.006	0.001	0.004	0.039	0.010	0.002	0.007	
Hole 769C																
Core-Section Interval (cm)	Unit 3		9R-3			9R-4		12R-5								
	5R-5 22-25		7R-1 108-112		121-122			46-49		114-117						
	mph	mph	mph	mph	mph	mph	Ac	Ar	Bc	Br	Ac	Ar	Bc	Br	Cc	Cr
SiO ₂	51.75	52.49	54.59	53.73	54.49	48.30	54.51	45.22	53.97	46.51	49.25	45.45	50.55	45.54	49.89	
TiO ₂	0.03	0.04	0.05	0.03	0.02	0.03	0.01	0.01	0.04	0.02	0.04	0.01	0.04	0.01	0.06	
Al ₂ O ₃	29.58	28.90	27.41	28.90	28.32	31.81	27.78	34.51	27.84	32.88	30.84	33.85	29.85	33.82	30.42	
Fe ₂ O ₃	0.68	0.58	0.69	0.63	0.74	0.67	0.58	0.58	0.76	0.61	0.74	0.62	0.79	0.53	0.79	
MnO	0.00	0.01	0.00	0.02	0.02	0.00	0.01	0.00	0.03	0.02	0.00	0.02	0.01	0.03	0.00	
MgO	0.12	0.08	0.08	0.07	0.07	0.06	0.03	0.07	0.08	0.11	0.17	0.05	0.14	0.11	0.18	
CaO	12.94	12.68	11.10	11.58	10.91	15.55	11.00	18.82	11.19	17.46	15.27	18.32	14.21	18.20	14.62	
Na ₂ O	3.84	4.19	4.95	4.61	5.08	2.63	5.03	0.77	4.87	1.47	2.66	0.98	3.32	1.01	2.98	
K ₂ O	0.21	0.16	0.29	0.20	0.23	0.07	0.22	0.02	0.26	0.05	0.11	0.02	0.13	0.04	0.14	
Total	99.15	99.13	99.16	99.77	99.88	99.12	99.17	100.00	99.04	99.13	99.08	99.32	99.04	99.29	99.08	
Si	2.372	2.404	2.489	2.436	2.466	2.234	2.483	2.089	2.466	2.161	2.275	2.112	2.330	2.116	2.301	
Ti	0.001	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.002	
Al	1.598	1.560	1.473	1.545	1.510	1.734	1.491	1.879	1.499	1.800	1.679	1.854	1.622	1.852	1.654	
Fe ³⁺	0.024	0.020	0.024	0.022	0.025	0.023	0.020	0.020	0.026	0.021	0.026	0.022	0.027	0.019	0.027	
Mn	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.000	
Mg	0.008	0.006	0.005	0.005	0.005	0.004	0.002	0.005	0.005	0.008	0.012	0.004	0.010	0.008	0.012	
Ca	0.636	0.622	0.542	0.563	0.529	0.771	0.537	0.932	0.548	0.869	0.756	0.912	0.702	0.906	0.723	
Na	0.341	0.372	0.438	0.405	0.446	0.236	0.444	0.069	0.431	0.132	0.238	0.088	0.297	0.091	0.267	
K	0.012	0.009	0.017	0.012	0.013	0.004	0.013	0.001	0.015	0.003	0.007	0.001	0.008	0.002	0.008	

Table 4. Representative microprobe analyses (wt % oxide) and atomic proportions of Cr-spinels (Cr-Sp), magnetites (Mt) and ilmenites (Ilm) from A. Sulu basement rocks and B. Cagayan Ridge volcanics. Fe²⁺/Fe³⁺ partitioning according to charge balance.

Core-Section Interval (cm)	A													
	Hole 768C Unit 1		Unit 2						Unit 3					
	73R-1 124-127	74R-1 14-16	75R-2 48-50	77R2 81-83	78R-2 114-116	81R-2 33-34	89R-4 108-111	91R-2 104-107	92R-1 61-65	93R-1 115-116	93R-3 77-78			
	Cr-Sp	Cr-Sp	Cr-Sp	Cr-Sp	Cr-Sp	Cr-Sp	Cr-Sp	Cr-Sp	Mt	Mt	Mt	Ilm	Ilm	Ilm
SiO ₂	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.00	0.00	0.00
TiO ₂	0.53	0.37	0.53	0.29	0.54	0.71	0.77	0.88	22.71	21.22	22.24	47.72	50.19	48.41
Al ₂ O ₃	20.35	14.16	19.76	23.34	20.42	22.81	22.04	19.79	2.21	2.80	1.86	0.15	0.15	0.11
Fe ₂ O ₃	6.42	4.72	6.41	7.10	6.36	7.36	6.67	9.99	22.27	24.77	23.39	11.27	7.62	11.08
FeO	13.73	14.03	15.61	12.83	14.94	13.87	15.41	14.06	45.91	45.15	44.47	37.31	37.00	37.11
MnO	0.23	0.33	0.24	0.17	0.26	0.27	0.25	0.26	6.28	5.42	7.15	0.46	0.43	0.50
MgO	13.93	12.79	12.75	14.65	13.38	14.04	13.15	13.88	0.06	0.29	0.15	2.82	4.24	3.24
CaO	0.15	0.59	0.12	0.42	0.14	0.13	0.14	0.09	0.06	0.08	0.08	0.02	0.05	0.08
NiO	0.19	0.15	0.11	0.21	0.16	0.15	0.17	0.21	0.04	0.06	0.04	0.08	0.09	0.04
Cr ₂ O ₃	44.39	53.49	44.55	41.44	44.77	39.81	41.35	40.93	0.01	0.08	0.04	0.09	0.34	0.05
Total	99.92	100.63	100.08	100.45	100.97	99.15	99.95	100.09	99.58	99.87	99.52	99.92	100.11	100.62
Si	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.030	0.000	0.000	0.000
Ti	0.099	0.071	0.099	0.053	0.100	0.132	0.143	0.164	5.099	4.736	5.003	1.783	1.849	1.791
Al	5.931	4.233	5.810	6.660	5.919	6.622	6.411	5.784	0.778	0.979	0.656	0.009	0.009	0.006
Fe ³⁺	1.195	0.901	1.203	1.294	1.177	1.364	1.239	1.864	5.004	5.531	5.265	0.421	0.281	0.410
Fe ²⁺	2.839	2.976	3.257	2.598	3.073	2.857	3.180	2.916	11.464	11.205	11.125	1.550	1.515	1.527
Mn	0.048	0.071	0.051	0.035	0.054	0.056	0.052	0.055	1.588	1.362	1.812	0.019	0.018	0.021
Mg	5.133	4.834	4.740	5.286	4.904	5.154	4.836	5.129	0.027	0.128	0.067	0.209	0.310	0.238
Ca	0.040	0.160	0.032	0.109	0.037	0.034	0.037	0.024	0.019	0.025	0.026	0.001	0.003	0.004
Ni	0.038	0.031	0.022	0.041	0.032	0.030	0.034	0.042	0.010	0.014	0.010	0.003	0.004	0.002
Cr	8.677	10.724	8.786	7.931	8.704	7.751	8.067	8.023	0.002	0.019	0.010	0.004	0.013	0.002
	Hole 768C Unit 3											Unit 4	Unit 5	Unit 6
Core-Section Interval (cm)			94R-1 74-77								96R-3 126-129	98R-3 68-69		100R-1 37-41
	Cr-Sp	Cr-Sp	Mt	Mt	Mt	Ilm	Ilm	Ilm	Ilm	Ilm	Mt	Mt	Mt	Cr-Sp
SiO ₂	0.00	0.00	0.15	0.03	0.14	0.16	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00
TiO ₂	1.34	0.25	26.05	9.54	16.36	51.72	52.61	50.11	48.40	47.79	0.69	1.01	4.08	0.87
Al ₂ O ₃	18.54	17.37	1.04	1.10	1.90	0.11	0.11	0.13	0.10	0.11	1.27	3.30	3.03	23.52
Fe ₂ O ₃	11.03	6.07	17.10	49.25	34.46	1.35	0.60	5.80	8.06	9.86	65.87	62.77	57.45	7.75
FeO	19.50	21.09	52.11	36.74	42.64	38.29	39.54	39.73	39.87	37.97	29.95	31.56	33.63	14.49
MnO	0.33	0.36	1.91	2.82	3.11	6.42	5.68	2.67	1.10	2.01	0.18	0.12	0.12	0.25
MgO	10.38	8.84	0.61	0.18	0.31	0.97	1.02	1.39	1.31	1.59	0.90	0.32	0.71	13.81
CaO	0.09	0.03	0.35	0.13	0.13	0.13	0.12	0.07	0.07	0.09	0.24	0.12	0.24	0.21
NiO	0.15	0.10	0.11	0.10	0.14	0.03	0.04	0.06	0.11	0.02	0.12	0.00	0.00	0.23
Cr ₂ O ₃	38.41	46.39	0.05	0.02	0.05	0.02	0.01	0.00	0.03	0.03	0.00	0.04	0.00	38.54
Total	99.77	100.50	99.48	99.91	99.24	99.20	99.73	99.96	99.05	99.47	99.39	99.24	99.26	99.67
Si	0.000	0.000	0.045	0.009	0.042	0.008	0.000	0.000	0.000	0.000	0.052	0.000	0.000	0.000
Ti	0.258	0.049	5.845	2.175	3.707	1.962	1.985	1.887	1.843	1.809	0.158	0.231	0.927	0.160
Al	5.591	5.276	0.366	0.393	0.675	0.007	0.007	0.008	0.006	0.007	0.457	1.181	1.079	6.789
Fe ³⁺	2.124	1.177	3.839	11.234	7.813	0.051	0.023	0.219	0.307	0.374	15.125	14.347	13.066	1.428

Table 4 (continued).

Fe ²⁺	4.173	4.545	13.003	9.313	10.744	1.616	1.659	1.664	1.688	1.599	7.643	8.017	8.500	2.968	
Mn	0.072	0.079	0.483	0.724	0.794	0.274	0.241	0.113	0.047	0.086	0.047	0.031	0.031	0.052	
Mg	3.958	3.395	0.271	0.081	0.139	0.073	0.076	0.104	0.099	0.119	0.409	0.145	0.320	5.040	
Ca	0.025	0.008	0.112	0.042	0.042	0.007	0.007	0.004	0.004	0.005	0.079	0.039	0.078	0.055	
Ni	0.031	0.021	0.026	0.024	0.034	0.001	0.002	0.002	0.005	0.001	0.030	0.000	0.000	0.045	
Cr	7.769	9.451	0.012	0.005	0.012	0.001	0.000	0.000	0.001	0.001	0.000	0.010	0.000	7.462	
B															
	Hole 769B Unit 3														
Core-Section Interval (cm)	31X-CC 26-29		3R-2 41-43	5R-5 22-25		7R-1 108-112		9R-3 121-122						9R-4 46-49	
	Mt	Mt	Mt	Mt	Mt	Mt	Mt	Mt	Mt	Mt	Mt	Mt	Ilm	Ilm	Mt
SiO ₂	0.00	0.00	0.16	0.13	0.00	0.20	0.13	0.00	0.00	0.14	0.17	0.00	0.00	0.00	0.16
TiO ₂	17.76	17.71	19.22	12.88	13.59	16.23	12.97	12.90	12.64	12.16	11.92	11.96	42.99	45.02	15.74
Al ₂ O ₃	2.10	2.08	2.97	3.18	2.56	2.77	2.91	2.44	2.38	2.66	2.70	2.33	0.37	0.30	2.52
Fe ₂ O ₃	33.11	32.95	27.78	40.83	40.17	34.72	40.86	42.60	42.95	42.85	43.28	43.91	13.58	11.43	36.03
FeO	44.09	44.14	47.67	39.86	40.16	42.00	39.20	39.14	38.96	38.82	38.77	37.88	39.00	39.43	41.87
MnO	0.55	0.60	0.47	0.55	0.47	0.53	0.52	0.63	0.58	0.52	0.52	0.62	0.53	0.71	0.63
MgO	2.04	1.88	0.70	2.00	2.02	2.61	2.30	2.40	2.36	2.18	2.07	2.44	3.04	3.11	2.13
CaO	0.03	0.03	0.11	0.04	0.04	0.03	0.17	0.01	0.01	0.04	0.16	0.03	0.05	0.06	0.31
NiO	0.00	0.04	0.05	0.06	0.05	0.02	0.05	0.03	0.00	0.10	0.04	0.01	0.01	0.01	0.00
Cr ₂ O ₃	0.02	0.04	0.04	0.03	0.05	0.02	0.05	0.02	0.06	0.04	0.02	0.02	0.00	0.00	0.05
Total	99.70	99.47	99.17	99.56	99.11	99.13	99.16	100.17	99.94	99.51	99.65	99.20	99.57	100.07	99.44
Si	0.000	0.000	0.048	0.038	0.000	0.059	0.039	0.000	0.000	0.042	0.050	0.000	0.000	0.000	0.047
Ti	3.949	3.952	4.309	2.863	3.044	3.602	2.891	2.856	2.807	2.710	2.654	2.676	1.640	1.700	3.500
Al	0.732	0.729	1.044	1.108	0.899	0.964	1.017	0.847	0.828	0.939	0.942	0.817	0.022	0.018	0.878
Fe ³⁺	7.367	7.357	6.232	9.083	9.003	7.710	9.113	9.437	9.544	9.557	9.644	9.829	0.518	0.432	8.016
Fe ²⁺	10.902	10.953	11.884	9.854	10.003	10.366	9.716	9.636	9.621	9.622	9.601	9.423	1.654	1.659	10.353
Mn	0.138	0.151	0.119	0.138	0.119	0.133	0.131	0.157	0.145	0.131	0.130	0.156	0.023	0.030	0.158
Mg	0.899	0.831	0.311	0.881	0.897	1.148	1.016	1.053	1.039	0.963	0.913	1.082	0.230	0.233	0.939
Ca	0.010	0.010	0.035	0.013	0.013	0.010	0.054	0.003	0.003	0.013	0.051	0.010	0.003	0.003	0.098
Ni	0.000	0.010	0.012	0.014	0.012	0.005	0.012	0.007	0.000	0.024	0.010	0.002	0.000	0.000	0.000
Cr	0.005	0.009	0.009	0.007	0.012	0.005	0.012	0.005	0.014	0.009	0.005	0.005	0.000	0.000	0.012

Table 5. Representative major element analyses (wt % oxide) of A. Sulu basement rocks and B. Cagayan Ridge volcanics. Analyses carried out by XRF fluorescence on dried powder at 1000°C; Loss on ignition (LOI) is reported below. Mg = Mg/(Mg+Fe²⁺) calculated with Fe³⁺/Fe²⁺ = 0.15. Columns A and C refer to analyses carried out at the Udine University and on board, respectively (see also analytical methods).

Core-Section Interval (cm)	A															
	Hole 768C Unit 1		Unit 2				Unit 3			Unit 4			Unit 5		Unit 6	Unit 7
	73R-1 124-127	74R-1 23-28	77R-1 65-68	82R-2 89-92	89R-4 12-15	90R-3 59-63	92R-1 61-65	93R-1 116-119	93R-3 78-81	94R-1 72-77	95R-1 30-38	96R-3 129-134	97R-3 55-59	98R-3 69-72	99R-4 43-49	100R-2 13-19
PBas C	PBas A	Bas C	Bas C	Dol A	Dol C	MGB C	MGB A	MGB C	MGB A	Bas A	Bas A	Bas A	Bas C	Bas A	Bas A	
SiO ₂	47.82	48.30	49.22	48.95	50.55	52.86	48.85	48.30	47.19	49.35	49.35	52.00	51.00	49.82	49.55	51.20
TiO ₂	0.80	0.84	1.04	0.98	0.85	1.05	0.83	0.66	0.75	0.83	1.03	1.02	0.95	1.13	1.00	1.10
Al ₂ O ₃	15.48	15.65	17.04	16.48	16.75	16.01	15.14	11.68	12.54	13.05	15.95	14.80	17.04	17.91	17.50	16.34
Fe ₂ O ₃	9.75	9.16	10.29	10.73	7.70	9.03	9.15	11.75	10.42	10.15	9.48	9.07	8.46	9.99	9.75	9.22
MnO	0.29	0.21	0.17	0.18	0.20	0.16	0.14	0.17	0.14	0.19	0.34	0.17	0.16	0.21	0.17	0.22
MgO	14.06	13.21	9.85	11.25	7.80	6.89	15.11	18.90	18.89	15.23	11.85	8.05	6.82	8.52	9.00	7.73
CaO	8.20	9.74	8.04	8.12	12.25	9.52	9.13	7.10	7.98	8.83	8.47	9.33	9.75	7.27	8.85	9.78
Na ₂ O	1.73	1.63	2.23	2.08	2.85	3.29	1.46	1.10	0.76	1.70	1.91	3.72	4.73	3.52	2.85	3.05
K ₂ O	0.58	0.45	0.98	0.56	0.51	0.37	0.07	0.08	0.05	0.08	0.83	1.02	0.34	1.33	0.61	0.78
P ₂ O ₅	0.16	0.17	0.18	0.17	0.15	0.15	0.10	0.10	0.10	0.17	0.18	0.13	0.16	0.18	0.17	0.15
Total	98.87	99.36	99.04	99.50	99.61	99.33	99.98	99.84	98.82	99.58	99.39	99.31	99.41	99.88	99.45	99.57
LOI	8.08	6.12	6.03	5.58	3.23	4.09	4.02	5.48	6.89	6.94	6.27	6.87	5.69	6.48	8.65	3.82
mg	76.66	76.66	68.55	70.48	69.76	63.47	79.00	78.56	80.50	77.36	74.00	66.90	64.74	66.01	67.77	65.63
Core-Section Interval (cm)	B															
	Hole 769B Unit 3		Hole 769C Unit 3				Hole 771A Unit 2									
	31X-CC 26-29	32X-CC 9-12	3R-2 41-43	4R-5 9-15	5R-5 22-25	7R-1 108-112	9R-3 116-120	9R-4 46-49	12R-5 114-117	11R-3 13-16	15R-3 69-72	17R-2 108-111	18R-3 129-132	18R-7 120-124	18R-7 142-144	18R-8 21-23
CA-Bas A	CA-Bas A	TH-Bas A	CA-Bas A	CA- BAnd A	CA- And C	CA- And A	CA- BAnd A	CA- BAnd A	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas A	
SiO ₂	53.60	51.70	50.60	51.25	55.35	56.50	58.39	52.85	54.10	49.10	50.90	51.45	49.40	50.15	51.00	49.20
TiO ₂	0.96	1.12	0.61	1.15	0.97	0.89	0.90	0.95	1.14	0.65	0.63	0.72	0.79	0.77	0.78	1.09
Al ₂ O ₃	18.30	14.66	17.57	18.20	18.59	17.70	16.70	19.42	17.95	15.25	18.10	16.12	18.12	17.50	19.30	17.90
Fe ₂ O ₃	8.05	9.75	9.38	9.25	7.40	7.73	7.71	7.39	8.00	10.47	9.53	9.58	10.37	9.80	9.50	12.27
MnO	0.12	0.14	0.12	0.14	0.12	0.15	0.15	0.16	0.18	0.24	0.18	0.19	0.20	0.22	0.18	0.25
MgO	4.20	8.18	7.52	5.12	3.59	3.90	3.26	4.08	5.30	9.20	8.25	6.05	5.83	7.17	4.92	4.15
CaO	7.63	9.69	10.20	8.87	7.68	7.97	7.15	8.72	8.90	12.77	8.90	11.40	11.02	11.20	10.58	10.77
Na ₂ O	3.45	2.44	2.31	2.80	3.64	3.03	3.38	3.20	2.93	1.75	2.07	2.63	2.45	2.12	2.63	2.47
K ₂ O	2.65	1.19	0.63	1.86	1.65	1.25	1.61	1.87	0.92	0.24	0.61	1.45	0.78	0.36	0.67	0.92
P ₂ O ₅	0.35	0.50	0.37	0.38	0.22	0.26	0.23	0.42	0.32	0.13	0.18	0.47	0.26	0.24	0.26	0.36
Total	99.31	99.37	99.31	99.02	99.21	99.38	99.48	99.06	99.74	99.80	99.35	100.06	99.22	99.53	99.82	99.38
LOI	2.03	2.48	2.80	1.83	1.72	1.21	1.14	1.40	2.19	2.50	5.14	5.48	2.94	2.13	1.68	3.08
mg	54.3	65.6	64.6	55.8	52.5	53.5	49.1	55.7	60.1	66.7	66.3	59.0	56.1	62.5	54.1	43.5

Rock name abbreviations: PBas, picritic basalt; Bas, basalt; MGB, microgabbro; Dol, dolerite; TH-Bas, tholeiitic basalt; CA-Bas, calc-alkaline basalt; CA-BAnd, calc-alkaline basaltic andesite; CA-And, calc-alkaline andesite.

Table 6 (continued).

Core-Section Interval (cm)	Hole 769B			Hole 769C						B		Hole 771A									
	Unit 3			Unit 3								Unit 2 2									
	31X-CC 26-29	32X-CC 9-12		3R-2 41-43	4R-5 9-15	5R-5 22-25	7R-1 108-112	9R-3 116-120	9R-4 46-49			12R-5 114-117	11R-3 13-16	15R-3 69-72	17R-2 108- 111	18R-3 129- 132	18R-7 120- 124	18R-7 142- 144		18R-8 21-23	
	CA-Bas A	CA-Bas C	B	TH-Bas C	CA-Bas A	CA-BAnd C	CA-And A	CA-And C	CA-BAnd A	B	CA-BAnd A	TH-Bas A	B	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas A	TH-Bas B	TH-Bas A
Sc	27	34	34.6		28	26	25		28	29.9	27	46	50.6	27	28	32	31	28	28.7	34	
V	270	338	331	248	310	295	217	267	245	276	240	248	353	220	305	250	225	223	284	350	
Cr	34	62		49	201	24	61	26	55		113	227		105	207	130	252	34		13	
Ni	19	54		70	62	21	24	9	29		79	51		58	78	59	101	16		10	
Ti			0.05							0.11										0.16	
Be			1.00							0.95										0.88	
Li			11.8							10.5										6.15	
Cs			0.32							0.10										0.54	
Rb	37	15	14.2	11	35	15	30	36	17	13.7	22	2	1.31	14	21	21	8	20	17.3	18	
Ba	220	211	186	63	220	225	188	187	182	148	182	60	52.1	116	119	117	87	142	132	131	
Sr	251	283	278	368	297	291	281	259	315	297	316	250	294	350	395	430	400	540	539	435	
Zr	108	89	81.7	51	86	124	91	110	111	102	103	28	30.5	46	52	61	57	67	58.6	73	
Hf			2.14							2.79										1.73	
Th			2.03							2.54										2.18	
U			0.33							0.52										0.51	
Pb			1.43							3.81										3.86	
Nb	9	22	19.6	4	19	10	14	10	14	12.1	14	2	1.55	2	4	4	4	4	3.16	4	
Y	30	39.1	34.0	23.8	31	31.1	24	32.7	31.0	22.5	25	15.7	13.1	12	18	20	22	24.2	20.5	29	
La		20.0	21.5	10.0		12.7		13.0	14.3	13.2		4.09	3.39					12.2	12.5	14.8	
Ce			30.6							27.0			8.45							25.4	
Pr			4.87							3.35			1.30							3.72	
Nd		18.6	21.2	10.1		14.8		15	14.8	14.4		6.41	6.59					15.5	16.6	19.1	
Sm		5.06	4.77	2.89		4.25		4.37	4.01	3.41		2.35	1.95					4.02	4.10	4.99	
Eu		1.55	1.57	0.95		1.31		1.23	1.29	1.06		0.80	0.74					1.31	1.28	1.52	
Gd		4.88	5.41	2.98		4.06		4.11	4.11	3.86		2.40	2.28					3.7	4.37	4.65	
Tb			0.80							0.59			0.37							0.61	
Dy		4.57	5.13	2.73		4.42		4.55	4.13	3.85		2.40	2.39					3.5	3.77	4.12	
Ho			1.08							0.83			0.49							0.78	
Er		2.71	3.16	1.73		2.59		2.78	2.54	2.49		1.44	1.44					1.98	2.32	2.39	
Tm			0.43							0.38			0.21							0.35	
Yb		2.53	2.85	1.73		2.79		2.88	2.66	2.45		1.33	1.44					1.98	2.25	2.34	
Lu		0.5	0.44	0.31		0.57		0.50	0.52	0.39		0.30	0.21					0.31	0.33	0.35	
⁸⁷ Sr/ ⁸⁶ Sr	a	0.70333(1)		0.70309(1)		0.70346(5)		0.70327(1)	0.70336(1)		0.70333(1)							0.70320(1)	0.70321(1)		
	b	0.70341(2)		0.70341(2)				0.70311(1)	0.70327(2)		0.70327(3)							0.70292(1)	0.70318(2)		
¹⁴³ Nd/ ¹⁴⁴ Nd				0.51280(1)				0.51283(1)										0.51286(1)	0.51283(1)		

Table 6. Representative trace-elements analyses (ppm element), $^{87}\text{Sr}/^{86}\text{Sr}$ and $^{143}\text{Nd}/^{144}\text{Nd}$ ratios of A. Sulu basement rocks and B. Cagayan Ridge volcanics. Columns A and C refer to analyses carried out by XRF and ICP (Y and REE with decimals); columns B refer to duplicate analyses carried out by the ICP-MS (see also analytical methods). For Sr-isotope (a) and (b) refer to 2.5 N and 6.15 N HCl cold leaching, respectively.

Core-Section Interval (cm)	A																	
	Hole 768C						Unit 2			Unit 3			Unit 4			Unit 7		
	Unit 1		77R-1	82R-2	89R-4	90R-3	92R-1	93R-1	93R-3	94R-1	97R-3	100R-2	72-77	55-59	13-19			
	73R-1 124-127	74R-1 23-28	77R-1	82R-2 65-68	89R-4	90R-3 89-92	92R-1 12-15	93R-1 59-63	93R-3	94R-1 61-65	97R-3 116-119	100R-2 78-81	72-77	55-59	13-19			
	PBas C	PBas C	B	Bas C	B	Bas C	Dol A	Dol C	B	MGb C	MGb A	MGb C	MGb C	Bas C	B	Bas C	B	
Sc			34.9		35.0		38		34.4		24				35.5	34	36.6	
V	280	268	261	315	302	294	208	236	262	185	175	187	208	278	286	289	294	
Cr	579	470		478		490	265	47		707	1396	1249	1029	251		214		
Ni	288	280		234		230	101	46		459	702	691	541	98		132		
Ti			0.05		0.05				0.01						0.04		0.07	
Bc			0.29		0.52				0.39						0.52		0.44	
Li			28.6		9.07				7.48						8.46		10.5	
Cs			0.10		0.19				0.21						0.59		0.15	
Rb	7	5	4.38	15	13.1	9	9	8	7.12	1	6	2		6	5.70	9	8.48	
Ba			18.4		19.0				19.9						8.00		21.4	
Sr	138	158	153	134	132	126	135	144	131	104	72	79	102	111	107	180	171	
Zr	44	48	42.2	63	54.7	61	66	72	47.6	45	44	42	63	58	52.0	73	60.9	
Hf			1.31		1.70				1.51						1.58		1.23	
Th			0.38		0.30				0.20						0.25		0.24	
U			0.12		0.25				0.04						0.11		0.08	
Pb			0.86		1.98				0.21						0.61		0.90	
Nb	2	<2	1.35	3	2.27	3	3	4	2.54	2	2	2	3	3	2.38	2	2.06	
Y	16	15.5	13.6	26.5	23.5	23	22	25.6	19.1	17.4	16.0	16	23	23.2	19.6	24.8	21.4	
La		3.85	3.34	4.39	4.01			3.87	3.26	3.07	2.53			3.39	2.92	3.73	3.25	
Ce			8.99	10.6	10.3				9.24						8.12		9.32	
Pr			1.50		1.60				1.44						1.33		1.54	
Nd		6.76	7.61	7.17	8.28			7.73	7.62	5.01	4.43			6.58	6.87	7.13	8.06	
Sm			2.31		2.54				2.46						2.34		2.58	
Eu		0.81	0.84	0.99	1.02			1.06	0.97	0.63	0.59			0.83	0.88	0.95	0.98	
Gd		2.31	2.70	3.13	3.52			3.26	3.20	2.19	2.13			2.93	3.07	3.24	3.30	
Tb			0.40		0.62				0.55						0.52		0.59	
Dy		2.33	2.63	3.73	4.20			3.85	3.69	2.47	2.35			3.36	3.53	3.49	3.92	
Ho			0.54		0.94				0.77						0.76		0.82	
Er		1.37	1.54	2.34	2.87			2.21	2.28	1.47	1.39			2	2.24	2.04	2.51	
Tm			0.23		0.42				0.32						0.33		0.33	
Yb		1.27	1.45	2.26	2.72			2.19	2.13	1.45	1.34			1.95	2.12	1.97	2.16	
Lu		0.18	0.23	0.36	0.40			0.39	0.32	0.19	0.25			0.34	0.33	0.31	0.34	
$^{87}\text{Sr}/^{86}\text{Sr}$ a		0.70339(1)								0.70308(1)	0.70323(7)			0.70441(3)				
b		0.70340(1)		0.70320(1)				0.70324(1)						0.70375(1)				
$^{143}\text{Nd}/^{144}\text{Nd}$		0.51297(3)		0.51301(4)						0.51301(3)								