

Appendix:

Geochemical data from the Uda-Murgal Island arc.

Sample data are summarized in figures 5,7.

Analytical details:

The data on rock compositions were acquired at the chemical-analytical center of GIN RAN (Institute of Geology, Russian Academy of Sciences). Major element contents were measured by the wet chemistry method; trace elements, by XRF (on a ARF 6 quantometer and a Philips PW2400 spectrometer); and REE, U, and Th, by INAA on a gamma spectrometer with a GEM-30185 Ortech semiconductor detector. Routine techniques ensuring standard precision were used [Zolotarev and Margolin, 1983*; Accelerated ... , 2005**].

* *Zolotarev, B. P., Margolin, E. M. (1983), Geochemistry and rare-earth element abundances of basalts from sites 482, 483, and 485 in the Gulf of California, Initial Reports of the Deep Sea Drilling Project, LXV, Washington, 579-590.*

** *Anonymous. Accelerated chemical methods of determination of rock-forming elements in rocks and ores, (2005), Federal Scientific-Methodical Tsentr of Laboratory Studies and Certification of Mineral Resources "VIMS", Moscow, 53 pp. (in Russian).*

Notes to table: (1) 222/4–219/5 – granitoids of East Taigonos pluton: 222/4 – diorite from endocontact zone; 223/2–222/6 – tonalites, granodiorites; 219/8–221/7 – biotite and two-mica granites; 219/5 – granite dike; Sample locations can be found in fig. 3 (see ETP), 4.

(2) M97-9/2–2333/16 – N-MORBs and within-plate basalts from Kingeveem units: M97-9/2–2329/12 – N-MORBs, 2333/27, 2333/16 – within-plate basalts; M97-17/10–2333/31 – low-K tholeiites from Kingeveem units; M97-11/10–9425/2 – boninites from Lagerny Unit; Sample locations can be found in fig. 3, 6.

(3) m205–208/15 – granitoids of Prybrezno-Taigonos belt: m205, m204 – diorites; 210/3–m209 – quartz diorites; 208/10–210/4 – tonalites; 208/7, 208/6 – diorites from endocontact zone; 208/15 – granite-aplite, dike; Sample locations can be found in fig. 3 (see B), 4.

-- no data

Appendix

Sample	222/4	223/2	223/1	222/7	219/2	219/9	219/11	222/6
SiO2	59.62	63.42	63.49	63.57	63.72	65.19	66.52	67.33
TiO2	1.40	0.62	0.83	0.56	0.92	0.43	0.58	0.60
Al2O3	18.04	16.09	15.62	16.51	15.62	14.74	14.60	15.24
Fe2O3	1.50	2.54	2.21	2.89	2.61	2.60	2.27	1.28
FeO	4.51	2.27	2.42	2.35	2.14	1.34	1.85	3.23
MnO	0.15	0.07	0.06	0.07	0.06	0.07	0.03	0.15
MgO	2.88	2.24	2.96	1.59	3.09	1.92	2.19	1.44
CaO	4.35	5.66	5.44	5.49	4.71	3.37	3.37	5.02
Na2O	5.42	3.89	4.37	4.06	4.37	5.18	4.37	3.93
K2O	1.35	1.88	1.96	1.97	2.14	3.69	2.72	1.31
P2O5	0.13	0.12	0.08	0.12	0.01	0.03	0.06	0.13
LOI	0.80	0.51	0.70	0.71	0.89	0.90	0.92	0.82
H2O	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-
Total	100.15	99.31	100.14	99.89	100.18	99.46	99.48	100.48
Cr	31	-	-	-	52	-	69	-
Co	15	-	-	-	6.7	-	11	-
Ni	-	-	-	-	-	-	-	-
V	-	-	-	-	-	-	-	-
Sc	24	-	-	-	6.2	-	9.4	-
Nb	3.2	3	2.4	3.6	4.5	-	4.8	4.0
Ta	0.2	-	-	-	0.44	-	0.36	-
Rb	31	40	40	38	55	-	77	17
Sr	430	580	580	510	370	-	290	450
Ba	280	620	650	610	590	-	620	750
Th	1.1	-	-	-	17	-	12	2.4
Zr	89	110	92	140	130	-	100	120
Y	14	8.6	7.4	15.0	14	-	12	10.0
Hf	2.1	-	-	-	5.6	-	3.5	-
La	5.3	9.70	10.00	12.00	15.0	-	-	12.00
Ce	14	20.00	23.00	33.00	32.0	-	-	26.00
Nd	8.4	9.50	11.00	24.00	15.0	-	-	11.00
Sm	2.2	1.80	1.90	3.10	3.2	-	-	2.30
Eu	0.82	0.61	0.60	0.80	0.75	-	-	0.68
Tb	0.46	0.24	0.22	0.41	0.43	-	-	0.29
Yb	1.4	0.80	0.78	1.20	1.3	-	-	1.20
Lu	0.23	0.13	0.13	0.19	0.19	-	-	0.18
Lan/Ybn	2.53	8.11	8.57	6.69	7.72	-	-	6.69
Lan/Smn	1.49	3.33	3.25	2.39	2.89	-	-	3.22
Eun/Eu*	1.04	1.09	1.07	0.84	0.76	-	-	0.97
ASI	0.99	0.85	0.82	0.88	0.87	0.78	0.89	0.90

Appendix 1 (continued)

Sample	219/8	219/12	221/1	221/7	219/5	M97-9/2	M97-12/30	M97-17/1
SiO ₂	70.06	71.26	75.13	76.05	76.50	47.75	41.66	46.78
TiO ₂	0.64	0.43	0.16	0.25	0.08	1.98	3.71	2.05
Al ₂ O ₃	13.56	13.67	13.28	12.57	12.20	13.18	11.79	13.04
Fe ₂ O ₃	1.20	2.44	0.59	1.18	0.78	4.17	9.12	5.71
FeO	1.51	0.64	0.49	0.37	0.44	9.07	11.27	9.52
MnO	0.05	0.03	0.01	0.01	0.01	0.19	0.36	0.23
MgO	1.00	0.25	0.40	0.41	0.32	6.50	6.14	6.28
CaO	3.84	2.91	0.55	0.65	0.38	9.13	9.14	9.39
Na ₂ O	4.49	3.98	4.18	4.18	3.78	3.68	2.38	2.81
K ₂ O	3.10	3.37	3.93	4.02	5.18	0.30	0.59	0.62
P ₂ O ₅	0.09	0.02	0.01	0.01	0.00	0.16	0.40	0.20
LOI	0.07	0.55	0.69	0.40	0.63	3.51	3.13	2.93
H ₂ O	-	-	-	-	-	-	-	-
CO ₂	-	-	-	-	-	-	-	-
Total	100.19	99.55	99.41	100.10	100.30	99.62	99.69	99.56
Cr	-	48	15	12	-	151	20.1	126
Co	-	6.5	0.8	1	-	49.8	41.2	38
Ni	-	-	-	-	-	66.6	15.7	50
V	-	-	-	-	-	390	735	496
Sc	-	6	2.3	2.2	-	45.4	46.2	-
Nb	4.6	5.3	6.7	6.8	-	4.9	9.3	3.9
Ta	-	0.42	0.58	0.5	-	-	-	-
Rb	76	93	97	97	-	4.7	7.6	15
Sr	250	200	97	100	-	145	91	110
Ba	600	700	790	770	-	-	-	-
Th	-	20	11	12	-	-	-	-
Zr	110	98	85	68	-	130	290	120
Y	10	11	9.4	9.6	-	40	96	44
Hf	-	4.6	3.3	3.6	-			
La	-	16	10	12	-	5.3	11	5.1
Ce	-	35	24	25	-	16	37	16
Nd	-	12	9	9	-	13	30	13
Sm	-	1.9	1.4	1.4	-	4.6	10	4.7
Eu	-	0.39	0.25	0.28	-	1.4	3.2	1.7
Tb	-	0.17	0.24	0.2	-	1.2	3	1.4
Yb	-	0.71	0.92	0.86	-	4.4	11	4.9
Lu	-	0.13	0.15	0.16	-	0.66	1.7	0.76
Lan/Ybn	-	15.07	7.27	9.33	-			
Lan/Smn	-	5.20	4.41	5.29	-			
Eun/Eu*	-	0.76	0.53	0.63	-			
ASI	0.76	0.88	1.08	1.02	0.98			

Appendix 1 (continued)

Sample	2328/3	2329/12	2333/27	2333/16	M-97-17/10	M-97-17/15	M-97-19/12	M-97-19/15
SiO ₂	50.24	50.27	45.20	49.91	46.04	46.24	51.77	50.81
TiO ₂	2.73	1.32	2.80	1.87	0.76	0.81	0.29	0.66
Al ₂ O ₃	13.39	12.32	15.55	18.82	14.94	14.26	14.67	14.90
Fe ₂ O ₃	4.86	4.93	3.02	6.44	4.60	4.07	3.16	3.35
FeO	5.78	8.65	9.34	2.99	7.25	7.98	4.73	6.32
MnO	0.31	0.21	0.14	0.07	0.19	0.19	0.15	0.20
MgO	6.15	7.20	9.71	4.44	9.04	9.52	8.21	9.74
CaO	9.75	8.11	4.39	4.23	9.47	9.34	8.22	5.03
Na ₂ O	3.78	4.55	3.27	5.79	3.19	3.26	4.64	3.71
K ₂ O	1.18	0.16	0.24	1.34	0.54	0.08	0.06	0.82
P ₂ O ₅	0.21	0.06	0.40	0.61	0.07	0.07	0.05	0.07
LOI	1.67	-	-	-	3.40	3.63	3.52	3.89
H ₂ O	-	-	4.68	-	-	-	-	-
CO ₂	-	-	1.19	-	-	-	-	-
Total	100.05	97.78	99.93	96.51	99.49	99.45	99.47	99.50
Cr	120	115	-	95	241	235	127	17
Co	47	52	-	32	39	36	25	26
Ni	65	95	-	100	95	110	49	31
V	420	370	-	210	302	288	196	216
Sc	48	46	-	-	-	-	-	-
Nb	5.2	2.4	29	-	1.3	1.2	1.3	1
Ta	0.3	0.2	-	-	-	-	-	-
Rb	25	5	2.8	-	11	1.4	1.3	13
Sr	110	120	300	-	190	190	58	130
Ba	-	-	-	-	-	-	-	-
Th	-	-	-	-	-	-	-	-
Zr	160	59	190	-	40	38	27	47
Y	49	24	29	-	17	14	11	17
Hf								
La	5.2	2.7	20	35	1.9	2.1	2.2	3.3
Ce	18	7.9	43	76	5.7	4.6	4.5	5.7
Nd	15	6.3	24	35	4.8	4.3	3.7	5.7
Sm	5.5	2.4	5.5	6.3	1.6	1.5	1.2	2.2
Eu	1.9	0.85	2	2.7	0.62	0.53	0.41	0.53
Tb	1.3	0.58	1	0.95	0.44	0.59	0.28	0.5
Yb	5.3	2.4	2.5	1.9	1.9	1.8	1.1	1.8
Lu	0.85	0.37	0.35	0.27	0.29	0.28	0.18	0.29

Appendix 1 (continued)

Sample	m-204	210/3	206/1	m-209	208/10	m-208	210/5	210/4
SiO2	56.34	58.62	58.75	60.11	63.98	64.40	66.33	67.07
TiO2	1.59	0.77	0.82	0.58	1.02	1.02	0.42	0.63
Al2O3	17.24	17.02	15.58	15.40	16.20	15.48	14.94	15.01
Fe2O3	1.43	1.89	1.97	4.51	0.61	1.19	2.33	0.67
FeO	7.18	5.49	6.29	3.84	4.58	4.49	2.43	3.16
MnO	0.20	0.21	0.18	0.03	0.15	0.14	0.06	0.12
MgO	2.84	2.82	3.61	2.75	1.93	2.14	0.99	1.10
CaO	7.20	6.65	7.53	6.74	5.15	5.26	5.47	5.60
Na2O	4.18	4.12	3.60	4.18	4.28	4.37	4.87	4.40
K2O	0.78	0.69	0.73	0.85	1.30	1.25	0.83	0.81
P2O5	0.30	0.15	0.08	0.00	0.20	0.14	0.04	0.09
LOI	0.60	1.45	0.84	0.92	0.74	0.55	1.37	1.18
H2O	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-
Total	99.88	99.88	99.98	99.92	100.14	100.43	99.58	99.84
Cr	-	-	-	31	43	21	17	-
Co	-	-	-	16	14	11	8.4	-
Ni	-	-	-	-	-	-	-	-
V	-	-	-	-	-	-	-	-
Sc	-	-	-	25	20	20	9.3	-
Nb	-	1.3	3.4	4.9	4.5	6	3.7	2.5
Ta	-	-	-	0.11	0.18	0.2	0.15	-
Rb	-	18	20	22	36	33	22	18
Sr	-	180	140	180	220	180	170	150
Ba	-	140	160	580	300	230	160	160
Th	-	-	-	2.2	2.4	3.6	1.4	-
Zr	-	84	96	180	170	190	86	86
Y	-	18	25	41	25	36	16	20
Hf	-	-	-	5.4	5.8	6.1	3.3	-
La	-	-	6.9	9.1	7.5	11	5	10.0
Ce	-	-	16.0	22	17	25	14	22.0
Nd	-	-	11.0	16	11	16	7.4	13.0
Sm	-	-	3.5	4.9	2.8	4.2	2.1	3.7
Eu	-	-	0.87	1.1	0.95	1.1	0.79	0.89
Tb	-	-	0.74	1	0.59	0.86	0.5	0.63
Yb	-	-	2.8	4.2	2.2	3.6	2	2.4
Lu	-	-	0.44	0.68	0.34	0.61	0.35	0.41
Lan/Ybn	-	-	1.65	1.45	2.28	2.04	1.67	2.79
Lan/Smn	-	-	1.22	1.15	1.65	1.62	1.47	1.67
Eun/Eu*	-	-	0.69	0.63	0.94	0.73	1.00	0.72
ASI	0.82	0.87	0.77	0.77	0.90	0.85	0.74	0.77

Appendix 1 (continued)

Sample	208/7	208/6	208/15
SiO ₂	59.10	59.17	75.82
TiO ₂	1.45	1.42	0.08
Al ₂ O ₃	15.93	15.68	12.96
Fe ₂ O ₃	1.82	1.15	0.22
FeO	5.99	7.00	1.25
MnO	0.34	0.35	<.01
MgO	2.73	3.18	0.41
CaO	6.29	4.90	1.13
Na ₂ O	4.57	4.57	3.98
K ₂ O	1.02	1.50	3.21
P ₂ O ₅	0.27	0.19	0.01
LOI	0.76	0.85	0.52
H ₂ O	-	-	-
CO ₂	-	-	-
Total	100.27	99.96	99.59
Cr	-	49	20
Co	-	33	2.6
Ni	-	-	-
V	-	-	-
Sc	-	21	3
Nb	-	5.6	4.6
Ta	-	0.3	0.28
Rb	-	42	48
Sr	-	230	69
Ba	-	310	620
Th	-	3.5	13
Zr	-	160	87
Y	-	27	12
Hf	-	4.9	4.5
La	-	14	12
Ce	-	37	27
Nd	-	20	9.6
Sm	-	4.5	1.4
Eu	-	1.8	0.41
Tb	-	0.74	0.37
Yb	-	3.2	1.7
Lu	-	0.54	0.32
Lan/Ybn	-	2.93	4.72
Lan/Smn	-	1.92	5.29
Eun/Eu*	-	1.20	0.75
ASI	0.79	0.89	1.07

