

Table 4. Bulk Rock Major-Element (wt.%) and Trace-Element (ppm) Compositions of Talc-Rich Metasomatic Rocks, and Average Serpentine Compositions of 24 Samples From the South Wall of the Atlantis Massif^a

Sample Depth, m	3645-1225 955	D3-46	3863-1419 794	3863-1425 794	3863-1526 778	3873-1124 959	D4-4	3642-1309 1751	Average	StDev
Type	Talc schist	Talc schist	Talc-amph schist	Talc-amph schist	Talc-amph schist	Talc-amph schist	Talc fels	Talc-amph fels	Serp.	Serp.
<i>Major Elements, weight %</i>										
SiO ₂	53.84	49.69	53.96	46.63	51.54	52.95	58.87	53.11	38.73	0.82
TiO ₂	0.024	0.100	0.071	0.058	0.021	0.009	0.007	0.061	0.023	0.02
Al ₂ O ₃	0.66	2.65	1.91	2.46	0.45	1.33	1.05	1.63	0.95	0.15
Fe ₂ O ₃	3.42	8.65	3.73	5.32	4.97	4.09	6.27	10.00	8.38	0.71
MnO	0.106	0.055	0.054	0.055	0.036	0.051	0.069	0.110	0.087	0.02
MgO	28.57	31.34	26.70	32.17	29.95	27.85	27.90	26.81	38.02	0.63
CaO	6.09	0.92	8.06	3.55	3.05	7.15	0.12	2.60	0.19	0.28
Na ₂ O	0.29	0.13	0.50	0.32	0.22	0.26	0.16	0.24	0.09	0.02
K ₂ O	0.06	0.04	0.02	0.05	0.02	0.01	0.04	0.05	0.02	0.01
P ₂ O ₅	0.02	0.04	0.01	0.04	0.05	0.01	0.01	0.02	0.04	0.02
LOI*	6.92	6.17	4.94	9.24	9.95	6.13	5.26	5.51	13.19	0.62
Total	99.99	99.77	99.96	99.89	100.24	99.85	99.77	100.14	99.91	0.33
CO ₂ , wt%	0.19	0.03	0.01	0.01	1.84	0.14	0.01	0.02	0.11	0.19
Density, g/cm ³			2.62	2.65	2.76				2.57	0.10
<i>Trace Elements, ppm</i>										
V	30	28	40	45	51	38	19	55	45	7
Cr	1070	1660	1420	1450	1570	1890	2000	2440	2467	396
Co	40	61	36	66	67	50	44	56	92	9
Ni	1000	1320	858	1300	1080	898	1170	1420	1852	241
Cu	<d.l.	<d.l.	28	<d.l.	11	<d.l.	<d.l.	23	13	14
Zn	50	<d.l.	<d.l.	<d.l.	<d.l.	32	52	147	36	11
Ga	2	4	3	3	1	3	2	5	2	1
Rb	<d.l.	<d.l.	<d.l.	<d.l.	2	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.
Sr	7	<d.l.	6	5	29	7	<d.l.	5	11	19
Y	2.6	17.1	2.8	2.0	1.3	1.2	<d.l.	3.5	1.2	1.1
Zr	<d.l.	92	6	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	4	5
Nb	1.0	1.0	1.0	0.9	<d.l.	0.6	<d.l.	1.2	0.1	0.05
Cs	<d.l.	<d.l.	<d.l.	<d.l.	0.2	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.
Ba	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	8	4
La	0.09	1.41	0.47	0.45	0.20	0.24	<d.l.	0.66	0.17	0.12
Ce	0.28	4.91	1.51	1.14	0.33	0.62	0.08	1.55	0.47	0.37
Pr	0.05	0.82	0.26	0.15	0.05	0.09	<d.l.	0.23	0.08	0.06
Nd	0.41	4.80	1.43	0.79	0.33	0.46	0.06	1.18	0.37	0.28
Sm	0.20	1.76	0.46	0.26	0.12	0.16	0.04	0.37	0.13	0.08
Eu	0.077	0.336	0.249	0.119	0.073	0.093	<d.l.	0.128	0.046	0.022
Gd	0.34	2.43	0.50	0.30	0.14	0.16	0.03	0.46	0.14	0.08



Table 4. (continued)

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Type	Talc schist	Talc schist	Talc-amph schist	Talc-amph schist	Talc-amph schist	Talc-amph schist	Talc fels	Talc-amph fels	Serp.	Serp.
Tb	0.08	0.48	0.09	0.06	0.03	0.03	<d.l.	0.09	0.03	0.02
Dy	0.50	3.16	0.54	0.37	0.20	0.23	0.03	0.53	0.18	0.12
Ho	0.10	0.71	0.11	0.08	0.04	0.05	<d.l.	0.11	0.04	0.02
Er	0.33	2.25	0.34	0.25	0.13	0.17	0.03	0.35	0.13	0.08
Tm	0.052	0.345	0.049	0.035	0.023	0.026	<d.l.	0.055	0.027	0.012
Yb	0.30	2.08	0.32	0.24	0.15	0.17	0.02	0.31	0.16	0.07
Lu	0.043	0.322	0.046	0.036	0.020	0.023	0.004	0.046	0.026	0.01
Hf	<d.l.	2.6	0.3	0.2	0.1	0.1	0.1	<d.l.	0.1	0.1
Ta	<d.l.	0.01	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	0.03	0.02
Pb	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	13	<d.l.	
Th	<d.l.	0.10	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	<d.l.	0.16	0.49
U	0.73	0.03	0.09	0.41	0.32	0.22	0.02	0.09	0.66	0.25
[La/Yb] _N	0.21	0.46	0.98	1.30	0.88	0.96		1.44	0.72	
Eu/Eu*	0.90	0.50	1.57	1.29	1.74	1.74		0.94	1.00	
[La/Sm] _N	0.29	0.50	0.63	1.09	1.05	0.92		1.13	0.78	
[Gd/Yb] _N	0.91	0.94	1.25	1.04	0.72	0.80	0.99	1.19	0.74	
[Dy/Er] _N	0.98	0.91	1.04	0.99	0.98	0.89	0.78	0.99	0.87	

^a Notes: <d.l., below detection limit; LOI, loss on ignition; Eu/Eu*, $Eu_N/(Sm_N * Gd_N)^{1/2}$; Eu_N , Sm_N , and Gd_N are the chondrite-normalized concentrations of Eu, Sm, and Gd, respectively. Serp., serpentinite.