

Table S1. Whole rock compositions of basalt from the Seifu Seamount

	SSM-Basalt			BHVO-2		
	EPMA		XRF	EPMA		RD**
in wt%	AVE	SD (2/45)*		AVE	SD (2/28)*	
SiO ₂	49.02	1.05	49.21	48.57	1.03	0.97
TiO ₂	1.86	0.06	1.79	2.84	0.1	1.04
Al ₂ O ₃	17.89	0.53	18.22	12.95	0.34	0.96
FeO*	9.81	0.33	9.54 (Fe ₂ O ₃)	12.14	0.43	1.06
MnO	0.21	0.07	0.19	0.2	0.07	1.19
MgO	6.39	0.2	6.24	7.45	0.25	1.03
CaO	8.88	0.2	8.51	11.77	0.24	1.03
Na ₂ O	4.05	0.13	3.67	2.31	0.12	1.04
K ₂ O	1.75	0.05	1.91	0.47	0.03	0.9
P ₂ O ₅	0.49	0.09	0.74	0.22	0.06	0.82
Total	100.35		100.02	98.92		
	LA-ICP-MS			LA-ICP-MS		
in µg/g	AVE	SD (2/6)*		AVE	SD (2/4)*	RD**
Sc	22.6	0.1		31.6	0.7	0.99
Ti	11696	128		16630	231	1.02
V	206	5		314	5	0.99
Cr	124	11		300	13	1.07
Mn	1608	22		1355	34	1.04
Co	42.0	1.1		45.7	1.0	1.01
Ni	143	6		128	4	1.08
Rb	36.4	0.8		9.0	0.2	0.98
Sr	678.8	6.0		407.2	7.4	1.03
Y	31.7	0.5		25.0	0.5	0.96
Zr	184.9	3.7		165.4	3.7	0.96
Nb	55.7	0.7		17.5	0.3	0.97
Ba	644.2	8.0		133.5	2.2	1.02
La	37.20	0.16		15	0.30	0.99
Ce	69.73	0.83		38.48	0.77	1.03
Pr	7.90	0.01		5.25	0.10	0.98
Nd	31.07	0.08		24.6	0.58	1.00
Sm	6.13	0.07		6.09	0.11	1.00
Eu	2.00	0.02		2.09	0.05	1.01
Gd	5.99	0.06		6.06	0.14	0.97
Tb	0.88	0.00		0.89	0.02	0.97
Dy	5.47	0.06		5.21	0.17	0.98
Ho	1.09	0.02		0.94	0.03	0.96
Er	3.21	0.03		2.5	0.10	0.99
Tm	0.45	0.01		0.31	0.01	0.94
Yb	3.01	0.04		1.96	0.06	0.98
Lu	0.50	0.01		0.3	0.03	1.08
Hf	5.09	0.28		4.54	0.37	1.04
Ta	3.25	0.04		1.11	0.02	0.98
Th	5.16	0.04		1.17	0.03	0.96
U	1.25	0.04		0.38	0.01	0.95
	TIMS					
¹⁴³ Nd/ ¹⁴⁴ Nd	0.512903 ±14					
⁸⁷ Sr/ ⁸⁶ Sr	0.703476 ±7					
²⁰⁶ Pb/ ²⁰⁴ Pb	17.664 ±8					
²⁰⁷ Pb/ ²⁰⁴ Pb	15.434 ±7					
²⁰⁸ Pb/ ²⁰⁴ Pb	37.308 ±17					

Major and trace-element data were overall averages of two fused glasses.

* standard deviation (SD) with numbers of analysis (glass/point).

The fused glass of BHVO-2 (USGS powdered reference material) was prepared and measured for quality control in the analysis. ** relative deviation (RD) to GeoReM preferred values (see appendix).