United States Geological Survey
Certificate of Analysis

Rhyolite, Glass Mountain, RGM-1

The rhyolite, from Glass Mountain, Siskiyou County, California, was collected from a single block of massive obsidian near the terminal front of a Holocene obsidian flow. The sample is classified as a rhyolite on the basis of its high silica and total alkali contents, and it is assigned to the calc-alkali series because of its high CaO to total iron ratio.

The concentrations were determined by cooperating laboratories using a variety of analytical methods. Values reported are derived from international data compliations (Abbey, 1983, Gladney and Roelandts, 1988, Govindaraju, 1994). Initial USGS reports (Flanagan, 1976) provide background information on this material.

Recommended values

Oxide	Wt %	±	Oxide	Wt %	±
SiO_2	73.4	0.53	MnO	0.036	0.004
Al_2O_3	13.7	0.19	Na_2O	4.07	0.15
Fe_2O_3	0.50	0.01	K_2O	4.30	0.10
FeO	1.27	0.05	TiO_2	0.27	0.02
Fe_2O_3T	1.86	0.03	CaO	1.15	0.07
			MgO	0.28	0.03

Element	µg/g	±	Element	µg/g	±	Element	µg/g	±
Ag	0.11	0.008	Eu	0.66	0.08	Sb	1.3	0.1
As	3.0	0.4	F	340	30	Sc	4.4	0.3
B	28	3	Ga	15	2	Sm	4.3	0.3
Ba	810	46	Gd	3.7	0.4	Sn	4.1	0.4
Be	2.4	0.2	La	24	1.1	Sr	110	10
Br	1.3	0.1	Li	57	8	Ta	0.95	0.1
Ce	47	4	Lu	0.4	0.03	Th	15	1.3
Cl	510	50	Mn	280	30	U	5.8	0.5
Co	2.0	0.2	Mo	2.3	0.5	V	13	2
Cs	9.6	0.6	Nb	8.9	0.6	W	1.5	0.18
Cu	12	1.4	Nd	19	1	Yb	2.6	0.3
Dy	4.1	0.1	Pb	24	3	Zr	220	20
			Rb	150	8			

Element	µg/g	Element	µg/g	Element	µg/g
Cr	3.7	Y	25	Zn	32

Denver, Colorado
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Bibliography

Abbey, S., 1983, Studies in "Standard Samples" of Silicate Rocks and Minerals 1969-1982, Canadian Geological Survey paper 83-15, p-114.

Flanagan, F.J., 1976, Descriptions and Analyses of Eight New USGS Rock Standards, U.S. Geological Survey Professional Paper 840, p 192

Gladney, E.S., and Roelandts, I., 1988, 1987 Compilation of Elemental Concentration Data for USGS BHVO-1, MAG-1, QLO-1, RGM-1, SCo-1, SDC-1, SGR-1, and STM-1, Geostandards Newsletter, 12: 253-362.

Govindaraju, K., 1994, 1994 Compilation of Working Values and Descriptions for 383 Geostandards, Geostandards Newsletter, 18:1-158

Glossary

Fe_2O_3T	Total iron expressed as Fe_2O_3
C_{tot}	Total concentration of carbon
S_{tot}	Total concentration of sulfur
Wt %	Percent of total element concentration
µg/g	Total element concentration expressed as micrograms of element per gram of solid sample
±	One standard deviation

Notes

Unless otherwise indicated total element concentrations are reported for material on an as-received basis, i.e., no drying.

Ordering Information

USGS reference materials (RMs) may be obtained directly from Dr. Stephen A. Wilson at the address or numbers listed below. The price for each bottle of RM is $65.00 (U.S.) **except** DGPM-1 which is $150.00 (U.S.). This cost includes all shipping and handling charges using normal mail delivery. Urgent requests for RMs should be initiated by FAX or e-mail. If required, overnight delivery is available with these charges added to the final bill.

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