

U.S. Geological Survey Certificate of Analysis Icelandic Basalt, BIR-1

Material for this reference material was collected from one of the interglacial lava flows often referred to as the Reykjavik dolerites, by Karl Gronwold of the Nordic Volcanological Institute at Reykjavik (Flanagan, 1984). The Reykjavik dolerites are a group of lava flows most likely from shield volcanos dating from the youngest interglacial periods. The rock is as a coarse-grained olivine tholeiite.

Recommended concentrations for elements and oxides are reported when results from USGS interlaboratory studies (Flanagan and Gottfried, 1980) using independent methods of analysis are in statistical agreement. Supplemental information derived from international data compilations (Abbey, 1983, Govindaraju, 1994) is also provided.

Information concentrations are given when results are based on analyses obtained using a single technique or when data from different procedures are not in statistical agreement.

Recommended Values

Oxide	Wt %	±	Oxide	Wt %	±
SiO ₂	47.96	0.19	Na ₂ O	1.82	0.045
Al ₂ O ₃	15.5	0.15	K ₂ O	0.030	0.003
CaO	13.3	0.12	MnO	0.175	0.003
MgO	9.70	0.079	P ₂ O ₅	0.021	0.001
FeO	8.34	0.10	TiO ₂	0.96	0.01
Fe ₂ O ₃	2.06	0.10	Fe ₂ O ₃ T	11.3	0.12
Element	µg/g	±	Element	µg/g	±
Cu	125	4	La	0.63	0.07
Dy	4	1	Li	3.6	0.2
Ce	1.9	0.4	Sc	44	1
Co	52	2	Sr	110	2
Cr	370	8	V	310	11
Eu	0.55	0.05	Y	16	1
Gd	1.8	0.4	Yb	1.7	0.1
Hf	0.6	0.08	Zn	70	9
Nd	2.5	0.7	Zr	18	1
Ni	170	6			

Information Values

Element	µg/g	Element	µg/g
As	0.44	Ga	16
B	0.33	Lu	0.26
Ba	7	Nb	0.6
Be	0.58	Pb	3
Cl	26	Sb	0.58
F	44	Sm	1.1

Certificate Information

Denver, Colorado

revised March 1998

David B. Smith

Central Region Mineral Resources Team (formerly Branch of Geochemistry)

Bibliography

Flanagan, F.J., 1984, Three USGS mafic rock reference samples, W-2, DNC-1, and BIR-1: U.S. Geological Survey Bulletin 1623, 54 p.

Gladney, E.S., and Roelandts, I., 1988, 1987 compilation of elemental concentration data for USGS BIR-1, DNC-1, and W-2: Geostandards Newsletter, 12:63-118.

Govindaraju, K., 1994, 1994 compilation of working values and descriptions for 383 geostandards: Geostandards Newsletter, 118:1-158.

Glossary

Symbol Definition

Fe₂O₃T Total iron expressed as Fe₂O₃.

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