United States 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_2O	1.82	0.045
Al_2O_3	15.5	0.15	K_2O	0.030	0.003
CaO	13.3	0.12	MnO	0.175	0.003
MgO	9.70	0.079	P_2O_5	0.021	0.001
FeO	8.34	0.10	TiO_2	0.96	0.01
Fe_2O_3	2.06	0.10	Fe_2O_3T	11.3	0.12

Element	µg/g	±	Element	µg/g	±	Element	µg/g	±
Cu	125	4	Hf	0.6	0.08	Sr	110	2
Dy	4	1	Nd	2.5	0.7	V	310	11
Ce	1.9	0.4	Ni	170	6	Y	16	1
Co	52	2	La	0.63	0.07	Yb	1.7	0.1
Cr	370	8	Li	3.6	0.2	Zn	70	9
Eu	0.55	0.05	Sc	44	1	Zr	18	1
Gd	1.8	0.4						

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

Denver, Colorado
revised March 1998

David B. Smith
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, p. 54

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

Fe_2O_3T	Total iron expressed as Fe_2O_3
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 $80.00 (U.S.) **except** DGPM-1 which is $175.00 (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.

Dr. Stephen A. Wilson
U.S. Geological Survey
Box 25046, MS 964
Denver, CO 80225

Tel: 303-236-2454
FAX: 303-236-3200 or 303-236-1425
e-mail: swilson@usgs.gov

Payment Options

Domestic customers: Payment options include purchase order, check, money order, or credit card (Visa, Mastercard).

International customers: Payment on foreign orders may be made by any of the following:

a. Banker's draft against an international bank,
b. International money order,
c. Credit card (Visa, Mastercard)

Payments for domestic or international orders using a credit card receive a 10% discount on the per bottle price.

BACK

URL: http://minerals.cr.usgs.gov/geo_chem_stand/icelandic.pdf