



United States Geological Survey

Certificate of Analysis

Andesite, AGV-1

AGV-1 is an andesite, collected from the eastern side of Guano Valley in Lake county Oregon, by George W. Walker of the U.S. Geological Survey. AGV-1 is aphanitic, finely porphyritic, with a trachytic texture. According to the chemical classification of Rittman (Rittman, 1952) this rock is a trachyandesite.

Element concentrations were determined by cooperating laboratories using a variety of analytical methods. Certificate values are based primarily on international data compilations (Gladney, 1983, Gladney and Roelandts, 1987, Govindaraju, 1994). Initial USGS studies (Flanagan, 1967) provide background information on this material.

Recommended values

Oxide	Wt %	±	Oxide	Wt %	±
SiO ₂	58.84	0.58	Fe ₂ O ₃ T	6.77	0.19
Al ₂ O ₃	17.15	0.34	Na ₂ O	4.26	0.12
CaO	4.94	0.14	K ₂ O	2.92	0.37
MgO	1.53	0.093	TiO ₂	1.05	0.05
P ₂ O ₅	0.50	0.03			

Element	μg/g	±	Element	μg/g	±	Element	μg/g	±
Ba	1230	16	Gd	5.0	0.6	Sc	12	1
Be	2.1	0.4	Ge	1.25	0.1	Sm	5.9	0.4
Ce	67	6	Hf	5.1	0.4	Sr	660	9
Cl	119	26	La	38	2	Ta	0.90	0.09
Co	15	1.2	Li	12	2	Tb	0.70	0.1
Cr	10	3	Lu	0.27	0.03	Th	6.5	0.5
Cs	1.3	0.1	Mn	710	50	U	1.92	0.15
Cu	60	6	Mo	2.7	0.9	V	120	11
Dy	3.6	0.4	Nd	33	3	Y	20	3
Eu	1.6	0.1	Pb	36	5	Yb	1.72	0.2
F	425	50	Rb	67	1	Zn	88	9
Ga	20	3	Sb	4.3	0.4	Zr	227	18

Oxides	Wt %	Other	Wt %
FeO	2.06	LOI	1.2
Fe ₂ O ₃	4.46	H ₂ O+	0.78
		H ₂ O-	1.00

Element	μg/g	Element	μg/g	Element	μg/g
Ag	0.078	Cd	0.069	Ni	16
As	0.88	Er	1.7	Pr	7.6
Au	0.00062	Hg	0.02	Sn	4.2
B	7.8	I	0.27	Tl	0.34
Bi	0.057	In	0.041	Tm	0.34
		Nb	15	W	0.55

Denver, Colorado
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David B. Smith
Branch of Geochemistry

Bibliography

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Glossary

Fe ₂ O ₃	Total iron expressed as Fe ₂ O ₃
C _{tot}	Total carbon concentration
S _{tot}	Total sulfur concentration
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.

Dr. Stephen A. Wilson
U.S. Geological Survey
Box 25046, MS 973
Denver, CO 80225

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

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