



# United States Geological Survey Certificate of Analysis

## Granite, G-2

Material was collected from the Sullivan quarry near Near Bradford, Rhode Island, which is approximately three miles east of the site where G-1 was collected. The material was collected by Felix Chayes, Geophysical Laboratory, Carnegie Institution.

Element concentrations were determined by cooperating laboratories using a variety of analytical methods. Certificate values are based primarily on international data compilations (Gladney, et al. 1992, Govindaraju, K., 1989, Govindaraju, 1994). USGS reports (Flanagan, F.J., 1969, Flanagan, 1976) provide background information on this material.

### Recommended values

Element	Wt %	±	Oxide	Wt %	±
Al <sub>2</sub> O <sub>3</sub>	15.39	0.30	MgO	0.75	0.03
CaO	1.96	0.08	MnO	0.03	0.01
Fe <sub>2</sub> O <sub>3</sub>	1.07	0.14	Na <sub>2</sub> O	4.08	0.13
FeO	1.46	0.08	P <sub>2</sub> O <sub>5</sub>	0.14	0.01
Fe <sub>2</sub> O <sub>3</sub> T	2.66	0.17	SiO <sub>2</sub>	69.14	0.3
K <sub>2</sub> O	4.48	0.13	TiO <sub>2</sub>	0.48	0.03

Element	µg/g	±	Element	µg/g	±	Element	µg/g	±
Ba	1880	23	Ga	23	2	Sm	7.2	0.7
Be	2.5	0.4	Hf	7.9	0.7	Sr	478	2
Ce	160	10	La	89	8	Th	25	2
Co	4.6	0.7	Li	34	4	V	36	4
Cs	1.34	0.16	Nd	55	6	Y	11	2
Dy	2.4	0.3	Pb	30	4	Yb	0.8	0.2
Eu	1.4	0.12	Rb	170	3	Zn	86	8
F	1280	80	Sc	3.5	0.4	Zr	309	35

### Information values

Element	µg/g	Element	µg/g	Element	µg/g
As	0.25	Gd	4.3	Se	0.07
B	2.4	Ho	0.4	Ta	0.5
Bi	0.04	Lu	0.11	Tb	0.48
Cl	70	Nb	12	Tm	0.18
Cu	11	Pr	18	W	0.2
Er	0.92	S <sub>tot</sub>	100		

Denver, Colorado  
revised March 1998

David B. Smith  
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## **Bibliography**

Flanagan, F.J., 1969, U.S. Geological Survey silicate rock standards, *Geochimica et Cosmochimica Acta*, v. 31, p. 289-308

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

Gladney, E.S., Jones, E.A., Nickell, E.J., and Roelandts, I., 1992, 1988 Compilation of elemental concentration data for USGS AGV-1, GSP-1 and G-2, *Geostandards Newsletter*, v. 16, p. 111-300.

Govindaraju, K., 1989, 1989 Compilation of working values and sample description of 272 geostandards, *Geostandards Newsletter*, v. 13, p. 1-113

Govindaraju, K., 1994, 1994 Compilation of working values and description for 383 geostandards, *Geostandards Newsletter*, v. 18, p. 1-158

## **Notes**

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

### **Drying instructions**

Certificate values are based on analyses performed on an as-received basis, i.e., drying is not required.

## **Ordering Information**

This reference material is no longer available.

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# United States Geological Survey Certificate of Analysis

## Syenite STM-1

A sample of peralkaline nepheline syenite was collected from a sill that underlies Table Mountain which is approximately 60 km WNW of Eugene, Oregon. The rock sample was light to medium gray and had a glassy luster. The material was holocrystalline and very fine to fine grained, having a very pronounced trachytic texture (Flanagan, 1976).

Element concentrations were determined by cooperating laboratories using a variety of analytical methods. Certificate values are based primarily on international data compilations (Abbey, 1983; Gladney and Roelandts, 1988; Govindaraju, 1994). Initial USGS studies (Flanagan, 1976) provide background information on this material.

### Recommended values

Oxide	Wt %	±	Oxide	Wt %	±
SiO <sub>2</sub>	59.6	0.49	CaO	1.09	0.06
Al <sub>2</sub> O <sub>3</sub>	18.4	0.23	MgO	0.10	0.02
Fe <sub>2</sub> O <sub>3</sub>	2.87	0.02	Na <sub>2</sub> O	8.94	0.20
FeO	2.09	0.03	K <sub>2</sub> O	4.28	0.07
Fe <sub>2</sub> O <sub>3</sub> T	5.22	0.1	P <sub>2</sub> O <sub>5</sub>	0.16	0.01
			TiO <sub>2</sub>	0.14	0.01

Element	µg/g	±	Element	µg/g	±	Element	µg/g	±
Ba	560	60	Gd	9.5	0.8	Sm	13	1
Be	9.6	0.6	Hf	28	2	Sr	700	30
Ce	260	18	La	150	6	Ta	19	1.2
Cl	460	40	Mn	1700	120	Tb	1.6	0.2
Cs	1.5	0.1	Nb	270	12	Th	31	3
Dy	8.1	0.5	Nd	79	7	U	9.1	0.1
Er	4.2	0.4	Pb	18	1.8	Y	46	5
Eu	3.6	0.3	Rb	118	6	Yb	4.4	0.4
F	910	50	Sb	1.7	0.2	Zn	235	22
Ga	35	5	Sc	0.61	0.07	Zr	1210	120

Element	µg/g	Element	µg/g	Element	µg/g
Ag	0.08	Co	0.9	Ni	3
As	4.6	Cr	4.3	S <sub>tot</sub>	43
B	6.4	Cu	4.6	Sn	6.8
Bi	0.13	Li	32	Tm	0.7
Cd	0.27	Mo	5.2	V	8.7

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## Glossary

$\text{Fe}_2\text{O}_3\text{T}$	Total iron expressed as $\text{Fe}_2\text{O}_3$
$\text{S}_{\text{tot}}$	Total concentration of sulfur
Wt %	Percent of total element concentration
$\mu\text{g/g}$	Total element concentration expressed as micrograms of element per gram of solid sample
$\pm$	One standard deviation

## Notes

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