United States Geological Survey
Certificate of Analysis

Dunite, Twin Sisters Mountain DTS-2B

Material used in the preparation of this reference material was collected from a quarry located in Twin Sisters Range, approximately 20-due-miles east of Bellingham, Washington. The Twin Sisters dunite is composed of virtually unaltered, coarse grained enstatite bearing dunite with accessory amounts of chromite and chromium diopside (Ragan, D.M., 1963). Mineralogical analysis of DTS-2B reveals that the dominant mineral is Fosterite (90+%) with minor amounts of chromite and trace amounts of lizardite. DTS-2B was collected from the same general location as DTS-1.

Element concentrations were determined in a round robin study involving 20 international laboratories. Recommended values are listed when analytical results provided by three independent laboratories using a minimum of two independent analytical procedures are in statistical agreement. Information values with standard deviations are listed when at least two independent laboratories have provided information. Information values without standard deviations represent information from a single laboratory or analytical procedure.

Recommended values

Oxide	Wt %	±	Oxide	Wt %	±
Al	0.24	0.03	Al_2O_3	0.45	0.06
Ca	0.09	0.01	CaO	0.12	0.01
Fe_{tot}	5.43	0.15	Fe_2O_{3tot}	7.76	0.21
Mg	29.8	1.1	MgO	49.4	1.8
Si	18.4	0.4	SiO_2	39.4	0.8

Element	µg/g	±	Element	µg/g	±
Co	120	10	Ni	3780	220
Cr	15500	1100	V	22	8
Mn	830	40	Zn	45	5

Information values

Element	Wt %	±	Element	µg/g
Fe(II)	4.27	0.20	Ba	16
Na	0.02		Cu	3
			Ge	0.7
			Pb	4
			Rb	2
			Sb	0.6
			Sc	3

Denver, Colorado
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Dr. Stephen Wilson
U.S. Geological Survey
Crustal Imaging and Characterization Team

Bibliography

Ragan, D.M., 1963, Emplacement of the Twin Sisters Dunite, Washington, American Journal of Science, 261:549-565.

Glossary

±	One standard deviation
Wt %	Weight percent of element/oxide as received
µg/g	Micrograms of element per gram of sample, as received

Notes

Unless otherwise indicated, total element concentrations are reported for material on an as-received basis.

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.

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URL: http://minerals.cr.usgs.gov/geo_chem_stand/dunitedts2.pdf

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