CENTRAL GEOLOGICAL LABORATORY

CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF ANALYSIS

USZ 28-99
Alkaline granite "OShBO-1,2"

Element	Mass fraction (based on dry mass at 105°C)		Number of accepted sets of results p
	Certified value (1) expressed as cg.g^{-1}	95% confidence interval (2) expressed as cg.g^{-1}	
SiO_2	71.61	0.17	35
Al_2O_3	16.13	0.22	32
ΣFe_2O_3	0.51	0.05	33
FeO	0.29	0.005	17
CaO	0.39	0.06	28
MnO	0.13	0.02	37
K_2O	3.52	0.07	34
Na_2O	5.25	0.13	32
P_2O_5	0.028	0.003	26
F	1.25	0.05	10
Loss on ignition	1.14	0.07	19
Cs_2O	0.012	0.002	18
Li_2O	0.37	0.01	17
Rb_2O	0.24	0.01	23
Cu	0.0008	0.0001	9
Zn	0.0086	0.0014	21
Ni	0.0010	0.0002	11
Pb	0.0064	0.0005	15
Zr	0.0046	0.0011	14
Nb	0.0071	0.0010	9
Ta	0.0054	0.0020	6

(1) This value is the unweighted mean of p accepted sets of results.
(2) The 95% confidence interval is a measure of the uncertainty and is acceptable when the reference material is used for calibration purposes.

TECHLAB
Matériaux de Référence Certifiés & Equipements de Laboratoire

4C la Tannerie – BP 30 055
57 072 – METZ CEDEX 3
Tél : (33) 03 87 75 54 29
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DESCRIPTION OF THE SAMPLE

The material is a reference material taken from the Ongon-Khairkhan mountain of Mongolia. The material consists of a homogeneous powder (particles have passed a sieve with appertures smaller than 63 μm).

The material contains the following minerals expressed as $cg.g^{-1}$:

Albite:	32.2	Potassium feldspar:	32.1
Quartz:	31.5	Muscovite-lepidolite:	3.7
Topaz, apatite:	0.35		
Zircon, sphen, magnetite, ilmenite, pyrite and others:	0.1		

Additional information is presented on the attached sheet.

INSTRUCTION FOR USE, STORAGE AND TRANSPORTATION

The recommended minimum sample intake is 100 mg. If there is a need of sample intake below 100 mg for an analytical method (e.g. the optic emission spectrometry), weigh more than 100 mg and mix in an agate mortar. Then wigh necessary weight.

Taken portions should not be poured back in a bottle as it may contaminate the material.

The reference material is stored in a polyethylene bottle of 100 g. The bottle should be stored preferably in a dry place at the room temperature, protected from an effect of chemical reagents.

The reference material can be transported by any kind of transport means.
Duration of production is 1996-1999. Duration of use is 20 years.

PARTICIPATING LABORATORIES

Preparation, homogeneity and stability testing:

- Central Geological laboratory

Certification analyses:

- Methods, Standardization, Control and Metrology Laboratory of the Central Geological Laboratory, Ulaanbaatar, Mongolia
- Chemistry Laboratory of the Central Geological Laboratory, Ulaanbaatar, Mongolia
- Physical Methods Laboratory of the Central Geological Laboratory, Ulaanbaatar, Mongolia
- Institute for Physics and technology, Academy of Science, Ulaanbaatar, Mongolia
- Chemistry Laboratory of the Mongolian-Soviet joint venture "Erdenet" concentrator, Erdenet, Mongolia

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- Chemical and Technological Centre for New Materials, Mongolian State University, Ulaanbaatar, Mongolia
- XRF analysis laboratory of the Institute for Geochemistry SO RAN, Irkutsk, Russia
- Chemical analysis laboratory of the Institute for Geochemistry SO RAN, Irkutsk, Russia
- Optic emission spectrometry analysis and reference materials laboratory of the Institute for Geochemistry SO RAN, Irkutsk, Russia
- Federal Institute for Geoscience and Natural resources, Hannover, Germany

METHODS USED

Methods of final determination were:

-gravimetric (SiO_2, LoI, H_2O^-)
-volumetric (Al_2O_3, Fe_2O_3, FeO, CaO, MgO, CO_2, Cu)
-spectral-photometry (SiO_2, TiO_2, Al_2O_3, Zr)
-photometry (SiO_2, TiO_2, Al_2O_3, Fe_2O_3, MnO, P_2O_3, F, Cr, Zn)
-flame photometry (K_2O, Na_2O, Li_2O, Rb_2O, Cs_2O)
-Atomic absorption spectrometry (AL_2O_3, Fe_2O_3, CaO, MgO, MnO, Na_2O, K_2O, Cs_2O, Li_2O, Rb_2O, Cr, Cu, Zn, Pb, Ni, Sr, As)
-X-ray fluorescence spectrometry (SiO_2, TiO_2, Al_2O_3, Fe_2O_3, CaO, MnO, Na_2O, K_2O, P_2O_5, F, Cs_2O, Rb_2O, Cr, Zn, Pb, Ni, Sr, Zr, As, Ce, La, Nb, Sc, Ta)
-optic emission spectroscopy (Cr, Cu, Zn, Pb, Ni, Zr, Ce, La, Nb, Sc, Ta)
-ICP-MS (MnO, Cs_2O, Rb_2O, Cr, Cu, Zn, Pb, Ni, Sr, Zr, As, Ce, La, Nb, Sc, Ta)
-ICP-AES (Li_2O, Cu, Zn, Pb, Ni, As)

LEGAL NOTICE

This reference material was confirmed and given the number USZ 28-99 by the National Center for Standardization and Metrology.

NOTE

A detailed technical report on the analysis procedure and the treatment of the analytical data is supplied with each sample.

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INFORMATION SHEET ATTACHED TO THE CERTIFICATE OF USZ 28-99

Additional information (not certified) on various contents is presented here. The data are mean values of various sets of results obtained by various techniques in various laboratories.

Element	Mass fraction expressed as $cg.g^{-1}$		Number of individual sets
	Content	Standard deviation	
TiO_2	0.03	0.01	20
MgO	0.29	0.08	10
H_2O^-	0.05	0.05	15
Cr	0.013	0.003	18
Sr	0.0010	0.0004	11
As	0.0003	0.0002	6
Ce	0.0025	0.0010	6
La	0.0015	0.0013	6
Sc	0.0007	0.0004	6

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