CENTRAL GEOLOGICAL LABORATORY

CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF ANALYSIS

USZ 33-2000
Graphite "ZBCh"

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	52.84	0.30	8
TiO_2	0.49	0.04	13
Al_2O_3	8.46	0.08	14
Fe_2O_3	3.61	0.19	12
MnO	0.07	0.01	12
Na_2O	0.51	0.04	12
K_2O	2.09	0.09	13
Loss on ignition	17.0	0.09	6
CO_2	2.45	0.04	10
C	13.38	0.67	8

(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.

DESCRIPTION OF THE SAMPLE

The material is a reference material taken from the Zulegtein deposit of the Central area 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}:

Graphite:	13.1	Quartz:	63.3
Sericite-muscovite:	9.7	Epidote:	3.3
Pyroxene:	0.1	Garnet:	2.3
Calcite:	1.4	Plagioclase:	5.1
Potassium feldspar	0.5	Lobite- hydrogoethite:	0.7
Magnetite, martite, ilmenite, pyrite:			0.5

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
Fax : (33) 03 87 36 23 90
Email : chezeaux@techlab.fr

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 weigh 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 1996-2000. 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
- Korean Atomic Energy research Institute, Taejon, Korea
- Institute for Geological mineral research, Ulaanbaatar, Mongolia
- Institute for Chemistry, Academy of Science, Ulaanbaatar, Mongolia

METHODS USED

Methods of final determination were:

-gravimetric (SiO_2, LoI, H_2O^-, C)
-volumetric (Al_2O_3, Fe_2O_3, FeO, CaO, MgO, CO_2)
-spectral-photometry (P_2O_5, Al_2O_3, Fe_2O_3)
-photometry (SiO_2, TiO_2, Al_2O_3, Fe_2O_3, P_2O_5)
-flame photometry (Na_2O, K_2O)
-Atomic absorption spectrometry (Al_2O_3, CaO, MgO, MnO, Na_2O)
-neutron activation analysis (Al_2O_3, TiO_2, Fe_2O_3, CaO, MgO, MnO, Na_2O, K_2O)
-X-ray fluorescence spectrometry (TiO_2, Al_2O_3, Fe_2O_3, CaO, Na_2O, MgO,

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MnO, K_2O, P_2O_5)
-ICP spectrometry (SiO_2, TiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, MnO, Na_2O, K_2O, P_2O_3)

LEGAL NOTICE

This reference material was confirmed and given the number USZ 33-2000 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 33-2000

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	
FeO	0.57	0.14	6
Ca	11.58	0.84	14
Mg	1.97	0.21	15
P_2O_5	0.20	0.02	10
H_2O^-	0.58	0.09	6

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