

CENTRAL GEOLOGICAL LABORATORY

CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF ANALYSIS

USZ 8-91, GSO 6358-92
Silver ore "RS-2"

Elements and compounds	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	
Ag	331 µg.g ⁻¹	12 µg.g ⁻¹	21
Cu	0.83	0.02	23
Cd	0.0020	0.0001	15
Pb	0.13	0.01	24
Zn	0.59	0.01	24
As	0.53	0.03	10
Sb	0.50	0.04	12
Bi	0.11	0.01	10
SiO ₂	17.80	0.20	14
TiO ₂	0.12	0.01	11
Al ₂ O ₃	2.11	0.07	14
Fe ₂ O ₃	48.40	0.40	12
MnO	2.77	0.06	8
MgO	1.48	0.04	12
CaO	0.25	0.03	10
K ₂ O	0.53	0.53	12
P ₂ O ₅	0.54	0.01	7
SO ₃	6.85	0.11	11

⁽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 silver-complex deposit "Asgat" in the western area of Mongolia. The material consists of a homogeneous powder (particles have passed a sieve with apertures smaller than 63 µm). The material contains the following minerals expressed as cg.g⁻¹:

Quartz: 13.7 Siderite: 59.0 Feldspar: 1.7 Arsenopyrite: 0.9
 Calcite: 1.2 Chalcosine, covellite: 1.6

Sphalerite: 0.4 Pyrite: 1.8 Chalcopyrite: 1.6
Hydrous ferric oxide: 6.6 Chlorite-potash mica: 8.4
Ag-Zn-bearing tetrahydrite: 1.6 Bi-bearing chalcostibite: 0.7
Hydrous manganic oxide (psilomelane): 2.7

Additional information is presented in the Annex.

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, 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.

Date of production is April, 1991. Duration of use is 10 years.

PARTICIPATING LABORATORIES

Preparation; homogeneity and stability testing:

- Central Geological Laboratory

Certification analyses:

- Central Geological Laboratory, State Geological Centre, Ulaanbaatar, Mongolia
- Institute for Geology of the Academy of Science, Ulaanbaatar, Mongolia
- Institute for Physics and Techniques of the Academy of Science, Ulaanbaatar, Mongolia
- Chemistry institute of the Academy of Science, Ulaanbaatar, Mongolia
- Nuclear Research Laboratory of Mongolian State University, Ulaanbaatar, Mongolia
- Expertise Laboratory of Mining Production of the Science-production Metrology Centre of the Ministry of National Development, Ulaanbaatar, Mongolia
- Reference Materials Section of the Science-production Metrology Centre of the Ministry of National Development, Ulaanbaatar, Mongolia
- All-Union Scientific-research Institute of Mineral resources (VIMS), Moscow, USSR
- Institut Geologiczny, Warszawa, PRL
- Central laboratory PGO "UJKAZGEOLOGY", Alma-Ata, USSR
- All-Union Scientific-research Institute of Mineral resources (VIMS), Complex Expedition, Naro-Fominsk, USSR
- Sverdlovsky branch of the VNIKIET, Sverdlovsk, USSR
- VNIITsVETMET, USSR
- GIREDMET, USSR
- Tulsy branch of the Central Research-scientific Institute for Geology and Exploration, Tula, USSR
- Sibtsvetmet Niiproekt, USSR
- Nevesk expedition, USSR

- Central laboratory "Centrkazgeology", USSR
- Magyar Allami Fuldani Intezet, Budapest, MNX
- Ustav Nerostnych Surovin, Kutna Hora, CSSR
- Zentrales Geologisches Institut, Berlin, DDR
- SDAG, Wismut, Aufbereitungsbetrieb, Grossen, DDR
- SDAG, Wismut, Geologischer Betrieb, Gr̃na, DDR

METHODS USED

Methods of final determination were:

- gravimetric (SiO₂, SO₃, LoI)
- volumetric (Al₂O₃, Fe₂O₃, FeO, SO₃, Zn, Pb, As, CaO, MgO, MnO, SO₃)
- photometry (TiO₂, P₂O₅, As, Sb, SiO₂, Al₂O₃, Fe₂O₃, Na₂O)
- Atomic Absorption Spectrometry (MnO, MgO, Ag, Cu, Zn, Sb, Cd, Pb, Bi, As, Ni, SiO₂, Al₂O₃, CaO, Na₂O)
- Arc emission spectrometry (Cu, Sb, Cd, Bi, As, Ni, TiO₂, P₂O₅)
- neutron activation (Cu, As)
- X-ray fluorescence spectrometry (Ag, Cu, Sb, Pb, Bi, As)
- polarigraph (Cu, Cd, Zn, Bi, Ni)
- ICP spectrometry (Zn, SiO₂, TiO₂, Al₂O₃, Fe₂O₃, CaO, MgO, MnO)

LEGAL NOTICE

This reference material was confirmed and given numbers by the Mining of National Development (UST 8-91) and the State Committee of Standards of USSR (GSO 6358-92).

NOTE

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

ANNEX

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.

Elements	Mass fraction expressed as cg.g ⁻¹	Number of individual sets	Elements	Mass fraction expressed as cg.g ⁻¹	Number of individual sets
Co	0.002	-	FeO	30.0	-
Ni	0.004	10	Na ₂ O	0.04	-
LoI	22.7	-	Cr ₂ O ₃	0.002	-