



CCRMP
Canadian Certified Reference Materials Project



PCMRC
Projet canadien de matériaux de référence certifiés

Certificate of Analysis

First issued: September 1992

Re-issued: March 2012

PTC-1a

Copper-Nickel Sulphide Concentrate with Noble Metals

CERTIFIED VALUES

Constituent	Ag µg/g	Au µg/g	Cu wt %	Ni wt %	Pd µg/g	Pt µg/g	Rh µg/g
Mean	56.0	1.31	13.51	10.03	4.48	2.72	0.33
Within-laboratory standard deviation	1.2	0.15	0.11	0.05	0.17	0.20	0.04
Between-laboratories standard deviation	2.7	0.22	0.17	0.06	0.22	0.18	0.08
95% Confidence interval	± 1.4	± 0.11	± 0.11	± 0.07	± 0.12	± 0.11	± 0.06

Source

The raw material for PTC-1a was donated by Inco from its Clarabelle mill in Copper Cliff, Ontario, Canada.

Description

PTC-1a is intended as a replacement for PTC-1, the stock of which is exhausted. It is a noble metals-bearing sulphide flotation concentrate of Sudbury ore. PTC-1a is composed of chalcopyrite, pentlandite, and pyrrhotite, with small amounts of quartz, feldspar, pyroxene, epidote, mica, pyrite and bravoite.

Intended Use

PTC-1a is intended for analysis of majors, minors, and trace elements in a copper-nickel sulphide concentrate. Examples of intended use are: for quality control in the analysis of samples of a similar type, method development, arbitration and the calibration of equipment.

Instructions for Use

The assigned values pertain to the date when issued. CCRMP is not responsible for changes occurring after receipt by the user. PTC-1a should be used "as is". The contents of the bottle should be thoroughly mixed before taking samples. After opening the sealed pouch, the bottle should be kept in a dessicator or resealed under nitrogen to prevent oxidation. The contents of the bottle should be exposed to the atmosphere for the shortest possible time.

Method of Preparation

The raw material was gradually dried on a steam-bed so that the internal temperature of the material did not exceed 50°C. After crushing and sieving, 300 kg of minus 74µm material was obtained. After blending, the material was bottled in 200-g units. This is the only size available. Each bottle was sealed under nitrogen, in a mylar-aluminum foil pouch to provide long-term protection against oxidation.

State of Homogeneity

A homogeneity assessment for gold, palladium and platinum was performed by an independent laboratory on 25 g samples using fire-assay preconcentrations with atomic absorption finish. CANMET-MMSL performed confirmatory measurements. In the assessment for copper and nickel performed by CANMET-MMSL, multi-acid dissolution of 0.5 g samples, followed by atomic absorption spectroscopy was used. No evidence of inhomogeneity was found for gold, palladium, platinum, copper and nickel. Use of a smaller sub-sample will invalidate the use of the certified value and associated parameters. Further details are available in CCRMP Report 99-1E.

Method of Certification

Nineteen industrial, commercial, and government laboratories participated in the 1992 interlaboratory certification program. Up to 14 elements were analyzed by a variety of methods. A statistical analysis of the data yielded recommended values for gold, copper, nickel, palladium, platinum, rhodium, and silver. Provisional values were assigned for arsenic, cobalt, iridium, iron, lead, ruthenium and sulphur. In 1999, statistical analysis of new data obtained from seven laboratories resulted in the revision of the value for nickel. The 1999 data were used exclusively for the recertification in order to obtain a lower between-laboratories standard deviation. Full details of all phases of the work in 1992 and 1999, including statistical analysis, the methods and the names of the participants are contained in CCRMP Report 99-1E.

Legal Notice

The Canadian Certified Reference Materials Project has prepared this reference material and statistically evaluated the analytical data of the interlaboratory certification program to the best of its ability. The purchaser, by receipt hereof, releases and indemnifies the Canadian Certified Reference Materials Project from and against all liability and costs arising out of the use of this material and information.

Certification History

The material was first released in September 1992. In 1999 the certificate was re-issued with a new value for nickel based on the statistical analysis of new data. The October 1999 version of the certificate was re-issued in March 2007 with no changes due to the expiration of the former. The March 2007 version of the certificate was re-issued in March 2012 with no changes due to the expiration of the former.

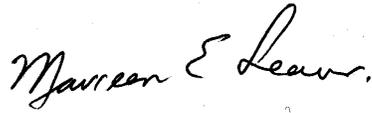
Period of Validity

These certified values are valid until March 31, 2034. The stability of the material will be monitored every two years. Purchasers will be notified of any significant changes.

Certifying Officers



Joseph Salley



Maureen E. Leaver

Reference

The preparation and certification procedures used for PTC-1a, including methods and values obtained by individual laboratories, are given in CCRMP Report 99-1E. This report is available free of charge on application to:

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PROVISIONAL VALUES

Constituent	As wt %	Co wt %	Fe wt %	Ir µg/g	Pb wt %	Ru µg/g	S wt %
Mean	0.012	0.30	34.6	0.11	0.05	0.21	31.8
Within-laboratory standard deviation	0.004	0.008	0.3	0.009	0.005	0.017	0.4
Between-laboratories standard deviation	0.003	0.019	0.4	0.016	0.006	0.000	0.7
95% Confidence interval	± 0.009	± 0.01	± 0.7	± 0.03	± 0.01	± 0.01	± 0.9