CCRMP
Canadian Certified Reference Materials Project

CANMET Mining and Mineral Sciences Laboratories
555 Booth Street, Ottawa, Ontario, Canada K1A 0G1
Tel.: (613) 995-4738, Fax: (613) 943-0573
E-mail: ccrmp@nrcan.gc.ca
www.ccrmp.ca

PCMRC
Projet canadien de matériaux de référence certifiés

Laboratoires des mines et sciences minérales de CANMET
555, rue Booth, Ottawa (Ontario) Canada K1A 0G1
Tél. : (613) 995-4738, Téléc. : (613) 943-0573
Courriel : pcmrc@rncan.gc.ca
www.pcmrc.ca

# Certificate of Analysis

First issued: September 1992 Version: April 2008

# PTM-1a

## Nickel-Copper Sulphide Matte With Noble Metals

### CERTIFIED VALUES

| Constituent | Au µg / g | Cu wt % | Ni wt % | Pd µg / g | Pt µg / g |
|---|---|---|---|---|---|
| **Mean** | 3.30 | 24.96 | 47.44 | 10.07 | 7.29 |
| **Within-lab SD** | 0.14 | 0.04 | 0.09 | 0.33 | 0.17 |
| **Between-lab SD** | 0.40 | 0.07 | 0.20 | 0.77 | 0.38 |
| **95% Confidence Limits** | ± 0.20 | ±0.04 | ±0.11 | ± 0.41 | ± 0.22 |

### PROVISIONAL VALUES

| Constituent | Ag µg/g | As wt % | Co wt % | Fe wt % | Ir µg/g | Pb wt % | Rh µg/g | Ru µg/g | S wt % |
|---|---|---|---|---|---|---|---|---|---|
| **Mean** | 135 | 0.22 | 2.05 | 1.48 | 0.35 | 0.029 | 0.94 | 0.7 | 22.4 |
| **Within-lab SD** | 2.0 | 0.004 | 0.01 | 0.05 | 0.02 | 0.004 | 0.05 | 0.1 | 0.4 |
| **Between-lab SD** | 7.0 | 0.03 | 0.03 | 0.08 | 0.04 | 0.006 | 0.12 | 0.1 | 0.9 |
| **95% Confidence Interval** | ± 4 | ± 0.26 | ±0.02 | ± 0.10 | ± 0.09 | ± 0.010 | ± 0.09 | ± 0.4 | ±1.1 |

**Source**

The raw material for PTM-1a was donated by Falconbridge Limited from its operation in Sudbury, Ontario.

## Description

PTM-1a is a replacement for PTM-1, the stock of which is no longer available. It is a nickel-copper matte. PTM-1a is composed of sulphides of nickel and copper with small amounts of cobalt and iron.

## Intended Use

PTM-1a is suitable for analysis of majors, minors, and trace elements in a nickel-copper matte. 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. PTM-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 crushed, milled and sieved to produce a product with a mesh size of less than 106µm. After blending, the material was bottled in 400-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 an ammonium chloride leach, followed by fire assay and atomic absorption finish. CANMET performed confirmatory measurements. No evidence of in-homogeneity was found for gold, palladium, and platinum. Use of a smaller sub-sample will invalidate the use of the certified value and associated parameters. Further details are available in the certification report.

## 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, palladium, and platinum. Provisional values were assigned for arsenic, cobalt, copper, iron, iridium, nickel, lead, rhodium, ruthenium, silver and sulphur. In 1999, statistical analysis of new data obtained from thirteen laboratories resulted in the revision of the values for cobalt, copper and nickel. The 1999 data were used exclusively for the revision of these three values in order to obtain a lower between-laboratories standard deviation. Due to transcription errors, minor changes in the 1992 values for palladium, platinum, and rhodium were made in this certificate. 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 2000-1E.

**Legal Notice**

CCRMP 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 CANMET-MMSL from and against all liability and costs arising out of the use of this material and information.

**Certification History**

PTM-1a was originally released in September 1992. The second version, released in February 2000, incorporated changes described under the method of certification section of this certificate. This version of the certificate, the third, was issued due to the expiration of the second version. The only change is the addition of a provisional value for sulphur, which was derived from the 1999 study.

**Period of Validity**

These certified values are valid until December 31, 2030. The stability of the material will be monitored every two years. Updates will be made via the CCRMP web site.

**Certifying Officers**

Joseph Salley, Data Processor

Maureen E. Leaver, CCRMP Coordinator

**Reference**

The preparation and certification procedures used for PTM-1a, including methods and values obtained by individual laboratories, are given in CCRMP Report 2000-1E. This report is available free of charge on application to:

**CCRMP**
**CANMET-MMSL (NRCan)**
**555 Booth Street**
**Ottawa, Ontario, Canada**
**K1A 0G1**
**Telephone: (613) 995-4738**
**Facsimile: (613) 943-0573**
**E-mail:** ccrmp@nrcan.gc.ca