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STANDARDS
Australia



Copper, lead and zinc sulfide concentrates — Determination of gold and silver — Fire assay gravimetric and flame atomic absorption spectrometric method



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AS ISO 10378:2022

This Australian Standard ® was prepared by MN-005, Copper, Lead, Zinc and Nickel Ores and Concentrates. It was approved on behalf of the Council of Standards Australia on 14 April 2022.

This Standard was published on 29 April 2022.

The following are represented on Committee MN-005:

Australian X-ray Analytical Association
Chamber of Minerals and Energy of Western Australia
CSIRO
International Copper Association Australia
Minerals Council of Australia

This Standard was issued in draft form for comment as DR AS ISO 10378:2022.

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ISBN 978 1 76113 716 7

Copper, lead and zinc sulfide concentrates — Determination of gold and silver — Fire assay gravimetric and flame atomic absorption spectrometric method

Originated in part as AS 2917—1986, AS 2678.5—2002 and AS 4030.3—2002.
Revised, amalgamated and redesignated as AS 4868.1—2008.
Revised and redesignated as AS ISO 10378:2022.

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Preface

This Standard was prepared by the Standards Australia Committee MN-005, Lead, Zinc and Nickel Ores and Concentrates, to supersede AS 4868.1-2008, *Copper, lead and zinc sulfide concentrates — Chemical analysis, Part 1: Determination of gold and silver — Fire assay gravimetric and flame atomic absorption spectrometric method*.

The objective of this document is to specify a fire assay gravimetric and flame atomic absorption spectrometric method for the determination of the mass fraction of gold and silver in copper, lead, and zinc sulfide concentrates as follows:

(a) Copper concentrates.

The method is applicable to the determination of mass fractions of gold from 0,5 g/t to 300 g/t and of mass fractions of silver from 25 g/t to 1 500 g/t in copper sulfide concentrates containing mass fractions of copper from 15 % to 60 %.

(b) Lead concentrates.

The method is applicable to the determination of mass fractions of gold from 0,1 g/t to 25 g/t and of mass fractions of silver from 200 g/t to 3 500 g/t in lead sulfide concentrates containing mass fractions of lead from 10 % to 80 %.

(c) Zinc concentrates.

The method is applicable to the determination of mass fractions of gold from 0,1 g/t to 12 g/t and of mass fractions of silver from 10 g/t to 800 g/t in zinc sulfide concentrates containing mass fractions of zinc up to 60 %.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 183, *Copper, lead, zinc and nickel ores and concentrates*.

This third edition cancels and replaces the second edition (ISO 10378:2005), in which 6.2 has been technically revised and the warning notice in 4.3.1 has been updated.

Introduction

This International Standard describes a method for the determination of the mass fraction of gold and silver in copper, lead, and zinc sulfide concentrates. This International Standard was prepared to enable laboratories to determine the mass fraction of gold and silver in suitable samples using instrumental methods.

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Australian Standard[®]

Copper, lead and zinc sulfide concentrates — Determination of gold and silver — Fire assay gravimetric and flame atomic absorption spectrometric method

WARNING — This International Standard may involve hazardous materials, operations, and equipment. It is the responsibility of the user of this International Standard to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies a fire assay gravimetric and flame atomic absorption spectrometric method for the determination of the mass fraction of gold and silver in copper, lead, and zinc sulfide concentrates as follows.

— Copper concentrates

The method is applicable to the determination of mass fractions of gold from 0,5 g/t to 300 g/t and of mass fractions of silver from 25 g/t to 1 500 g/t in copper sulfide concentrates containing mass fractions of copper from 15 % to 60 %.

— Lead concentrates

The method is applicable to the determination of mass fractions of gold from 0,1 g/t to 25 g/t and of mass fractions of silver from 200 g/t to 3 500 g/t in lead sulfide concentrates containing mass fractions of lead from 10 % to 80 %.

— Zinc concentrates

The method is applicable to the determination of mass fractions of gold from 0,1 g/t to 12 g/t and of mass fractions of silver from 10 g/t to 800 g/t in zinc sulfide concentrates containing mass fractions of zinc up to 60 %.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 385, *Laboratory glassware — Burettes*

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 4737, *Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use*

ISO 9599, *Copper, lead and zinc sulfide concentrates — Determination of hygroscopic moisture in the analysis sample — Gravimetric method*