AS 2678.1—2008
ISO 13291:2006



Australian Standard®

# Zinc sulfide concentrates—Chemical analysis

## Part 1: Determination of zinc—Solvent extraction and EDTA titrimetric method



This Australian Standard® was prepared by Committee MN-005, Copper, Lead, Zinc and Nickel Ores and Concentrates. It was approved on behalf of the Council of Standards Australia on 24 January 2008.
This Standard was published on 12 March 2008.

---

The following are represented on Committee MN-005:

- CSIRO Minerals
- Minerals Council of Australia

Additional Interests:

- Minerals industry analytical laboratories

---

This Standard was issued in draft form for comment as DR 07035.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

---

## Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting **www.standards.org.au**

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at **mail@standards.org.au**, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

---

Australian Standard®

# Zinc sulfide concentrates—Chemical analysis

# Part 1: Determination of zinc—Solvent extraction and EDTA titrimetric method

Originally as AS 2678.1—1984.
Second edition 2008.



Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 8586 7

# PREFACE

This Standard was prepared by the Standards Australia Committee MN-005, Copper, Lead, Zinc and Nickel Ores and Concentrates, to supersede AS 2678.1—1999.

The objective of this Standard is to provide those involved in the analysis of zinc concentrates with a standardized method for determining zinc, supported by precision data obtained from an interlaboratory test program.

The objective of this revision is to adopt the latest edition of the corresponding International Standard.

This Standard is identical with, and has been reproduced from ISO 13291:2006, *Zinc sulfide concentrates—Determination of zinc—Solvent extraction and EDTA titrimetric method.*

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text 'this International Standard' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

(d) Substitute 'L' for 'l' as the unit for litres.

References to International Standards should be replaced by references to Australian Standards, as follows:

| *Reference to International Standard* | | *Australian Standard* | |
|---|---|---|---|
| ISO | | AS | |
| 9599 | Copper, lead and zinc sulfide concentrates—Determination of hygroscopic moisture in the analysis sample— Gravimetric method | 2916 | Copper, lead and zinc sulfide concentrates—Determination of hygroscopic moisture in the analysis sample—Gravimetric method |

Only international references that have been adopted as Australian Standards have been listed.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

# CONTENTS

*Page*

AUSTRALIAN STANDARD

# Zinc sulfide concentrates—Chemical analysis

## Part 1:
## Determination of zinc—Solvent extraction and EDTA titrimetric 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 solvent extraction/titrimetric method for the determination of the mass fraction of zinc in zinc sulfide concentrates.

The method is applicable to zinc sulfide concentrates having a mass fraction of zinc in the range from 11 % to 62 %.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. 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 — One-mark pipettes*

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

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

ISO 4787, *Laboratory glassware — Volumetric glassware — Methods for use and testing of capacity*

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

ISO Guide 35, *Reference materials — General and statistical principles for certification*

## 3 Principle

A test portion of zinc concentrate is dissolved in bromine and nitric acid. Any remaining insoluble residue is dissolved in sulfuric, nitric and hydrofluoric acids. A zinc thiocyanate complex is selectively extracted into methyl isobutyl ketone, after screening of some elements with thiourea and citrate ions. Partially extracted cadmium is screened with iodide ions before the final titration as explained in Annex C. Cobalt is extracted and determined separately, if present at concentration levels exceeding 0,05 %. Zinc is determined by titration with EDTA solution at pH 5,5.