

Australian Standard<sup>®</sup>

---

**METHODS FOR THE ANALYSIS OF  
ZIRCON SAND CONCENTRATES**

**Part 11—DETERMINATION OF  
ACID DEMAND VALUE**

---

This Australian standard was prepared by Committee MN/4, Heavy Mineral Sands. It was approved on behalf of the Council of the Standards Association of Australia on 29 May 1984 and published on 2 July 1984.

---

The following interests are represented on Committee MN/4:

- Australian Foundry Institute
- Chamber of Mines of W.A. (Incorporated)
- CSIRO, Division of Mineral Chemistry
- CSIRO, Division of Mineralogy
- NSW Chamber of Mines and Extractive Industries
- Oil and Colour Chemists Association Australia

---

**Review of Australian Standards.** *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.*

*Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.*

*Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.*

---

## PREFACE

This standard was prepared by the Association's Committee on Heavy Mineral Sands under the direction of the Minerals Standards Board. The significance of the acid demand value has been questioned, but in view of its usefulness by foundrymen as a guide to binder requirements for zircon sand moulds, the industry has requested the preparation of this standard.

First published . . . . . 1984
--------------------------------

*This standard was issued in draft form for comment as DR 82203.*

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

## METHODS FOR THE ANALYSIS OF ZIRCON SAND CONCENTRATES

## PART 11—DETERMINATION OF ACID DEMAND VALUE

**1 SCOPE.** This standard sets out a method for the determination of the acid demand value of zircon sand concentrates.

NOTE: Clause 9 describes the procedure for obtaining acid demand values at pH 3.00, pH 4.00 and pH 5.00. However, in some cases, a determination at a single pH value (preferably 5.00) may give significant information.

**2 APPLICATION.** The method is applicable to all zircon sand concentrates.

**3 REFERENCED DOCUMENTS.** The following standards are referred to in this standard:

AS 1006 Solid Stem General Purpose Thermometers

AS 2165 Burettes and Bulb Burettes

AS 2166 One-mark Pipettes.

**4 DEFINITION.** For the purpose of this standard, the following definition applies:

*Acid demand value*—the volume (in millilitres) of 0.1 mol/L hydrochloric acid which will react with 100 g of zircon sand.

**5 PRINCIPLE.** The zircon sand concentrate is stirred with dilute hydrochloric acid. The solid is filtered off and the resulting solution titrated with dilute sodium hydroxide solution. The acid demand value at pH 3, pH 4 and pH 5 is calculated from the amount of hydroxide solution required to titrate the acidic solution to these pH values.

**6 REAGENTS.**

**6.1 Water.** The water used shall be distilled water, boiled and adjusted to pH 7.0 with either hydrochloric acid (0.001 mol/L) or sodium hydroxide solution (0.001 mol/L).

**6.2 Hydrochloric acid (approximately 0.1 mol/L).** Add 10 mL of hydrochloric acid ( $\rho_{20}$  1160 kg/m<sup>3</sup>) to 800 mL of water and mix. Dilute to 1 L in a volumetric flask and mix. Standardize against sodium hydrogen carbonate using methyl orange as indicator.

**6.3 Sodium hydroxide solution (approximately 0.05 mol/L).** Add 2.00 g of sodium hydroxide pellets to 500 mL of water and mix. Dilute to 1 L in a volumetric flask and mix. Standardize against the hydrochloric acid (6.2) using methyl orange as indicator.

**7 APPARATUS.**

**7.1 Volumetric glassware.** Class B one-mark pipettes and burettes complying with AS 2166 and AS 2165 respectively.

**7.2 Balance.** A balance accurate and readable to the nearest 0.1 g.

**7.3 Mechanical stirrer.** A mechanical stirrer with a glass impeller, capable of maintaining a constant speed over a period of 15 min.

**7.4 pH meter.** A pH meter, accurate to the nearest 0.05 unit. The pH meter shall be calibrated immediately prior to use against solutions having pH of 4.00 and 7.00.

NOTE: Solutions having these pHs can be obtained by the use of commercially available tablets.

**7.5 Magnetic stirrer.**

**7.6 Thermometer.** A mercury-in-glass thermometer complying with AS 1006.

**8 SAMPLES.** Samples shall be taken by the specified sampling procedure\* and used without further particle size reduction.

**9 PROCEDURE.**

**9.1 Test portion.** Weigh  $100 \pm 0.1$  g of zircon sand concentrate into a clean, dry 250 mL beaker.

---

\* In course of preparation.