
INTERNATIONAL STANDARD



2865

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Aluminium oxide primarily used for the production of aluminium — Determination of boron content — Curcumin spectrophotometric method

First edition — 1973-12-15

ANSI Internat Doc Sect

JAN 4 - 1974

UDC 661.862.22 : 546.27 : 543.42

Ref. No. ISO 2865-1973 (E)

Descriptors : aluminium oxide, chemical analysis, determination of content, boron, spectrophotometry.

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2865 was drawn up by Technical Committee ISO/TC 47, *Chemistry*, and circulated to the Member Bodies in August 1972.

It has been approved by the Member Bodies of the following countries :

Austria	Ireland	South Africa, Rep. of
Belgium	Israel	Sweden
Czechoslovakia	Italy	Switzerland
Egypt, Arab Rep. of	Mexico	Thailand
France	New Zealand	Turkey
Germany	Poland	United Kingdom
Hungary	Portugal	U.S.S.R.
India	Romania	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Netherlands

© International Organization for Standardization, 1973 •

Printed in Switzerland

Aluminium oxide primarily used for the production of aluminium – Determination of boron content – Curcumin spectrophotometric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a curcumin spectrophotometric method for the determination of the boron content of aluminium oxide primarily used for the production of aluminium.

The method is applicable to boron contents, expressed as boron oxide (B_2O_3), greater than 0,000 6 % (i.e. 0,000 2 % expressed as boron (B)).

NOTE — The sensitivity of the method, as may be gathered from the calibration curve, is in fact higher. In the case of a very low blank reading, and with sufficiently sensitive apparatus, the lower limit of application of the method may be extended to 0,000 08 % of boron oxide (B_2O_3), corresponding to 0,000 025 % of boron (B).

2 REFERENCE

ISO/R 802, *Aluminium oxide primarily used for the production of aluminium – Preparation and storage of test samples*.

3 PRINCIPLE

Dissolution of a test portion in phosphoric acid. Separation of the boron by distillation as methyl borate. Formation of a red-coloured complex between the boron and the curcumin reagent at pH 7.

Spectrophotometric measurement of the complex at a wavelength of about 550 nm.

4 REAGENTS

Distilled water, or water of equivalent purity, shall be used in the test.

4.1 Orthophosphoric acid, ρ approximately 1,70 g/ml, about 85 % (m/m) solution.

4.2 Methanol, ρ approximately 0,79 g/ml.

4.3 Ethanol, ρ approximately 0,81 g/ml.

4.4 Glycerol, alkaline solution.

Dissolve 1 g of sodium hydroxide and 0,1 g of sodium chloride in about 100 ml of water to which has been added 3,0 ml of glycerol. Store this solution in a silica flask.

4.5 Curcumin reagent solution.

Add to a 250 ml silica one-mark volumetric flask :

- 175 ml of the ethanol (4.3);
- 3,75 g of oxalic acid [$(COOH)_2 \cdot 2H_2O$];
- 6,25 ml of hydrochloric acid solution, ρ approximately 1,19 g/ml, about 38 % (m/m) solution;
- 19 ml of water;
- 0,087 5 g of curcumin.

Shake until completely dissolved, dilute to the mark with the ethanol (4.3) and mix.

Store in the dark and at about 20 °C. This solution is stable for at least 2 months.

4.6 Boron, standard solution, corresponding to 0,08 g of B_2O_3 per litre.

Weigh, to the nearest 0,000 1 g, 0,142 1 g of boric acid (H_3BO_3). Transfer to a silica beaker of convenient capacity (for example 200 ml) and dissolve in water. Transfer the solution quantitatively to a 1 000 ml silica one-mark volumetric flask, dilute to the mark and mix.

1 ml of this standard solution corresponds to 0,08 mg of B_2O_3 .

4.7 Boron, standard solution, corresponding to 0,000 8 g of B_2O_3 per litre.

Place 10,0 ml of the standard boron solution (4.6) in a 1 000 ml silica one-mark volumetric flask, dilute to the mark and mix.