
International Standard



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Aluminium oxide primarily used for the production of aluminium — Determination of zinc content — PAN photometric method

Oxyde d'aluminium principalement utilisé pour la production de l'aluminium — Dosage du zinc — Méthode photométrique au PAN

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Foreword

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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 2072 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in May 1980.

It has been approved by the member bodies of the following countries :

Austria	Germany, F. R.	Poland
Belgium	Hungary	Romania
Brazil	India	South Africa, Rep. of
Canada	Ireland	Sweden
China	Italy	Switzerland
Czechoslovakia	Korea, Rep. of	United Kingdom
Egypt, Arab Rep. of	Mexico	USSR
France	Netherlands	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Australia
USA

This International Standard cancels and replaces ISO Recommendation R 2072-1971, of which it constitutes a technical revision.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

Aluminium oxide primarily used for the production of aluminium — Determination of zinc content — PAN photometric method

WARNING — Attention is drawn to the dangers involved in the use of chloroform (see the note to 4.11).

1 Scope and field of application

This International Standard specifies a 1-(2-pyridylazo)-2-naphthol (PAN) photometric method for the determination of the zinc content of aluminium oxide primarily used for the production of aluminium.

The method is applicable to products having zinc contents, expressed as ZnO, in the range 0,002 to 0,12 % (*m/m*).

2 Reference

ISO 804, *Aluminium oxide primarily used for the production of aluminium — Preparation of solution for analysis — Method by alkaline fusion*.

3 Principle

Alkaline fusion of a test portion, and dissolution of the fused mass in nitric acid.

Separation of the zinc in the form of its thiocyanate by extraction with 4-methylpentan-2-one.

Re-extraction of the zinc with an aqueous hydrochloric acid solution.

Formation of the PAN-zinc complex, at pH 7,5, in the presence of tartaric acid, sodium thiosulphate and nitroso-R salt.

Extraction of the coloured PAN-zinc complex with chloroform, and photometric measurement at a wavelength of about 560 nm.

NOTE — The addition of tartaric acid eliminates interference by traces of aluminium and iron and the addition of thiosulphate and nitroso-R salt eliminates interference by copper and cobalt.

4 Reagents

During the analysis, use only reagents of recognized analytical grade and only water which has been doubly distilled from a borosilicate glass apparatus with ground joints. Avoid the use of lead glass.

The reagents specified in ISO 804, clause 4, and

4.1 Hydrochloric acid, 220 g/l solution.

4.2 Ammonium thiocyanate, 500 g/l solution, purified.

4.2.1 Preparation of the solution

Dissolve 50 g of ammonium thiocyanate in water and dilute to 100 ml.

4.2.2 Purification of the solution

Adjust the pH of the solution (4.2.1) to 7,5, checking with the pH meter (5.2), by adding the sodium hydroxide solution (4.7), followed by the sodium hydroxide solution (4.8). Transfer the solution to a separating funnel of suitable capacity, add 10 ml of the PAN solution (4.10) and 30 ml of the chloroform (4.11), and shake vigorously for a few minutes. Allow to settle, draw off the organic phase and discard it. Again add to the aqueous phase 10 ml of the PAN solution and 30 ml of the chloroform, shake, allow to settle and draw off and discard the organic phase. Repeat the extractions until the organic phase is completely colourless. Remove the last traces of PAN by shaking with the chloroform and, after decantation, discard the organic phase.

Place the aqueous phase in a borosilicate glass or plastic flask.