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2830

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Cryolite, natural and artificial — Determination of aluminium content — Atomic absorption method

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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 2830 was drawn up by Technical Committee ISO/TC 47, *Chemistry*, and circulated to the Member Bodies in July 1972.

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

Australia	India	South Africa, Rep. of
Austria	Ireland	Sweden
Belgium	Israel	Switzerland
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Egypt, Arab Rep. of	Netherlands	United Kingdom
France	Poland	U.S.S.R.
Germany	Portugal	
Hungary	Romania	

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

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

New Zealand

Cryolite, natural and artificial — Determination of aluminium content — Atomic absorption method

1 SCOPE

This International Standard specifies a flame atomic absorption method for the determination of the aluminium content of natural and artificial cryolite.

2 FIELD OF APPLICATION

The method is applicable to the determination of aluminium in natural and artificial cryolite of normal composition for which the molar ratio NaF/AlF_3 is equal to about 3.

3 REFERENCE

ISO/R 1619, *Cryolite (natural and artificial) — Preparation and storage of test samples*.

4 PRINCIPLE

Dissolution of a test portion in concentrated sulphuric acid and treatment with hydrochloric acid and water. Atomization of the solution into an acetylene-*d*nitrogen monoxide flame and determination of the aluminium content by photometric measurement of the absorption of the 309,3 nm line emitted by an aluminium hollow cathode lamp.

5 REAGENTS

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

5.1 Sulphuric acid, ρ approximately 1,84 g/ml, about 96 % (m/m) solution.

5.2 Hydrochloric acid, ρ approximately 1,19 g/ml, about 38 % (m/m) solution.

5.3 Sodium chloride, 4,067 g/l solution.

Weigh, to the nearest 0,000 1 g, 0,406 7 g of sodium chloride, previously dried at 105 °C and cooled in a desiccator, place in a 100 ml one-mark volumetric flask, dissolve in a little water, dilute to the mark and mix.

5.4 Aluminium, standard solution, corresponding to 1,00 g of Al per litre.

Pickle 1,5 g of extra pure aluminium (99,999 % purity), in the form of shavings obtained by milling or drilling, in a little nitric acid, ρ approximately 1,40 g/ml, about 68 % (m/m) solution.

Wash the pickled shavings with water and then dry them by washing with acetone. Weigh, to the nearest 0,000 1 g, 1,000 g of the dried shavings, put them in a tall-form beaker of suitable capacity (for example, 250 ml) and add about 100 ml of water, 5 ml of the hydrochloric acid solution (5.2) and 10 ml of the sulphuric acid solution (5.1). Wait until the reaction subsides, then place the beaker on a sand bath and maintain a gentle heat until all the aluminium has dissolved. Allow to cool, transfer the solution quantitatively to a 1 000 ml one-mark volumetric flask, dilute to the mark and mix.

1 ml of this standard solution contains 1,00 mg of Al.

6 APPARATUS

Ordinary laboratory apparatus and

6.1 Platinum dish, diameter about 75 mm, height about 30 mm.

6.2 Atomic absorption spectrophotometer, fitted with a burner fed from cylinders of acetylene and *d*nitrogen monoxide.

6.3 Aluminium hollow cathode lamp

7 PROCEDURE

7.1 Test portion

Weigh, to the nearest 0,000 1 g, 0,500 g of the dried test sample, prepared according to the instructions in clause 2.3 of ISO/R 1619.