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3256

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Aluminium and aluminium alloys — Determination of magnesium — Atomic absorption spectrophotometric method

Aluminium et alliages d'aluminium — Dosage du magnésium — Méthode par absorption atomique

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FOREWORD

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International Standard ISO 3256 was developed by Technical Committee ISO/TC 79, *Light metals and their alloys*, and was circulated to the member bodies in September 1976.

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

Australia	Italy	South Africa, Rep. of
Belgium	Japan	Spain
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Hungary	Portugal	U.S.S.R.

The member body of the following country expressed disapproval of the document on technical grounds :

United Kingdom

Aluminium and aluminium alloys – Determination of magnesium – Atomic absorption spectrophotometric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies an atomic absorption spectrophotometric method for the determination of magnesium in aluminium and its alloys. The method is applicable to products having magnesium contents between 0,01 and 5 %.

2 REFERENCE

ISO . . . , *General conditions of application of atomic absorption spectrophotometry*.¹⁾

3 PRINCIPLE

Dissolution of the test portion with hydrochloric acid and hydrogen peroxide. Atomization of this solution in an acetylene/air flame, in the presence of strontium chloride, or in a dinitrogen monoxide/acetylene flame of the atomic absorption apparatus.

Comparison of the absorption of resonance energy of magnesium (wavelength 285,2 nm, normally, or 279,6 nm : less sensitive) with that of standard solutions.

4 REAGENTS

During the analysis, use only reagents of recognized analytical grade, and only distilled water or water of equivalent purity.

4.1 Hydrochloric acid, ρ approximately 1,1 g/ml, about 20 % (m/m) solution.

Dilute 500 ml of hydrochloric acid, ρ approximately 1,19 g/ml, about 38 % (m/m) solution, with 500 ml of water.

4.2 Hydrogen peroxide, approximately 30 % (m/m) solution.

4.3 Sulphuric acid, ρ approximately 1,48 g/ml, about 58 % (m/m) solution.

While stirring and cooling, add 50 ml of sulphuric acid, ρ approximately 1,84 g/ml, 96 % (m/m) solution, to 40 ml of water. Cool again; then dilute to volume in a 100 ml volumetric flask and mix.

4.4 Hydrofluoric acid, ρ approximately 1,13 g/ml, about 40 % (m/m) solution.

4.5 Nitric acid, ρ approximately 1,40 g/ml, about 68 % (m/m) solution.

4.6 Aluminium, base solution : 20 g/l.

Weigh, to the nearest 0,01 g, 20 g of previously pickled aluminium free from magnesium (purity $\geq 99,99$ %); place in a beaker of suitable size (1 000 ml, for instance), and cover. Add, in small portions, 800 ml of the hydrochloric acid (4.1) and, if necessary, a drop of metallic mercury to assist the attack. If necessary, warm gently to help the dissolution; then add a few drops of the hydrogen peroxide (4.2), and boil for a few minutes to remove the excess of hydrogen peroxide. After cooling, quantitatively transfer the solution so obtained to a 1 000 ml volumetric flask; dilute to volume and mix.

25 ml of this solution contain 0,5 g of aluminium.

4.7 Aluminium, base solution : 1 g/l.

Transfer 50,0 ml of the base aluminium solution (4.6) to a 1 000 ml volumetric flask; dilute to volume and mix.

100 ml of this solution contain 0,1 g of aluminium.

25 ml of this solution contain 0,025 g of aluminium.

5 ml of this solution contain 0,005 g of aluminium.

4.8 Strontium chloride (SrCl_2), 50 g/l solution.

Weigh, to the nearest 0,01 g, 76 g of $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$; transfer it to beaker of suitable size (400 ml for instance) and dissolve with about 400 ml of water. Transfer quantitatively to a 500 ml volumetric flask; dilute to volume and mix.

Keep this solution in a bottle made of plastic material.

4.9 Magnesium, standard solution, 1 g/l.

Weigh, to the nearest 0,000 2 g, 1 g of extra-pure magnesium (purity $\geq 99,95$ %) and transfer it to a conical flask of suitable size (1 000 ml, for instance). Add about 200 ml of water, then 30 ml of the hydrochloric acid (4.1) and

1) In preparation.