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Chemical analysis of magnesium and its alloys — Determination of rare earths — Gravimetric method

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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 2355 was drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*.

It was approved in October 1971 by the Member Bodies of the following countries :

Austria	Ireland	South Africa, Rep. of
Belgium	Italy	Sweden
Canada	Japan	Switzerland
Egypt, Arab Rep. of	Korea, Rep. of	Turkey
Finland	Netherlands	United Kingdom
France	New Zealand	U.S.A.
Germany	Norway	U.S.S.R.
Hungary	Poland	
India	Romania	

No Member Body expressed disapproval of the document.

Chemical analysis of magnesium and its alloys – Determination of rare earths – Gravimetric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a gravimetric method for the determination of rare earths in magnesium alloys.

The method is applicable to the determination of contents of rare earths between 0.2 and 10 %, in the absence of thorium.

2 PRINCIPLE

2.1 Dissolution with hydrochloric acid.

2.2 Precipitation of zirconium by ammonia and filtration.

2.3 Preliminary separation of rare earths in the filtrate in the form of sebacates, in ammoniacal medium.

2.4 Dissolution of the two precipitates and re-precipitation of rare earths in the form of oxalates.

2.5 Ignition and weighing of rare earth oxides.

3 REAGENTS

During the analysis use only distilled water or water of equivalent purity.

3.1 Ammonium chloride (NH_4Cl).

3.2 Hydrochloric acid (ρ 1.19 g/ml) approximately 12 N solution.

3.3 Ammonia (ρ 0.95 g/ml) approximately 7 N solution.

Dilute 50 ml of ammonia solution (ρ 0.90 g/ml) approximately 14 N, with water, make up the volume to 100 ml and mix.

3.4 Ammonia (ρ 0.97 g/ml) approximately 3.5 N solution.

Dilute 25 ml of ammonia solution (ρ 0.90 g/ml) approximately 14 N, with water, make up the volume to 100 ml and mix.

3.5 Ammonia, 0.3 N solution approximately.

Dilute 2 ml of ammonia solution (ρ 0.90 g/ml) approximately 14 N, with water, make up the volume to 100 ml and mix.

3.6 Hydrogen peroxide (ρ 1.12 g/ml approximately) 33 % (m/m) solution approximately.

3.7 Nitric acid/hydrogen peroxide solution

Dilute 30 ml of hydrogen peroxide (3.6) with 150 ml of water and add 30 ml of nitric acid, (ρ 1.40 g/ml) approximately 15 N solution.

3.8 Sebacic acid, ammoniacal solution 50 g/l.

Dissolve 50 g of sebacic acid [$\text{HOOC}(\text{CH}_2)_8\text{COOH}$] in 400 ml of ammonia solution (ρ 0.90 g/ml) 14 N approximately, and 300 ml of water. Filter, dilute to 1 000 ml with water.

3.9 Oxalic acid, solution saturated at room temperature.

Dissolve 150 g of oxalic acid in 1 000 ml of hot water. Allow to cool and filter.

3.10 Oxalic acid wash solution

Dilute 70 ml of oxalic acid (3.9) to 500 ml with water.

3.11 Bromophenol blue alkaline solution 4 g/l.

Place 0.4 g of bromophenol blue in a mortar, add 8.25 ml of sodium hydroxide solution 5 g/l and crush to complete dissolution. Transfer quantitatively to a 100 ml volumetric flask, make up to volume with water and mix.

4 APPARATUS

4.1 Ordinary laboratory equipment.

All volumetric vessels should be checked in accordance with the official standards.