
INTERNATIONAL STANDARD



2297

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

Chemical analysis of aluminium and its alloys — Complexometric determination of magnesium

First edition — 1973-02-15

UDC 669.71 : 545.2 : 546.46

Ref. No. ISO 2297-1973 (E)

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 2297 was drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*.

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

Austria	Ireland	South Africa, Rep. of
Belgium	Italy	Sweden
Egypt, Arab Rep. of	Japan	Switzerland
Finland	Korea, Rep. of	Thailand
Germany	Norway	Turkey
Hungary	Poland	U.S.A.
India	Romania	U.S.S.R.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Canada
France
United Kingdom

© International Organization for Standardization, 1973 •

Printed in Switzerland

Chemical analysis of aluminium and its alloys – Complexometric determination of magnesium

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a complexometric method for the determination of magnesium in aluminium alloys.

The method is applicable to the determination of magnesium contents between 0,1 and 12 %.

2 PRINCIPLE

2.1 Acid attack of the test portion, filtration of the insoluble residue and recovery of magnesium in the residue.

2.2 Separation of the major part of the aluminium, zinc, copper, nickel and chromium, by treatment with sodium hydroxide solution in the presence of hydrogen peroxide, potassium cyanide and a small quantity of iron to entrain the magnesium precipitate.

2.3 Dissolution in hydrochloric acid of the residue containing all the magnesium; precipitation of the iron, manganese, aluminium and titanium, by treatment with zinc oxide and potassium permanganate, and filtration.

2.4 Addition to the filtrate of suitable masking agents to prevent any possible interference by heavy metals, and titration of the magnesium with CDTA solution.

3 REAGENTS

3.1 Zinc oxide (ZnO)

Pure analytical reagent.

3.2 Hydrochloric acid ($\rho = 1,09$ g/ml approximately), solution approximately 6 N.

Dilute 515 ml of hydrochloric acid ($\rho = 1,18$ g/ml approximately), solution approximately 12 N, with water, and make up the volume to 1 000 ml.

3.3 Hydrochloric acid ($\rho = 1,03$ g/ml approximately), solution approximately 2 N.

Dilute 170 ml of hydrochloric acid ($\rho = 1,18$ g/ml approximately), solution approximately 12 N, with water, and make up the volume to 1 000 ml.

3.4 Hydrochloric acid solution approximately 0,05 N.

Dilute 25 ml of hydrochloric acid (3.3) with water, and make up the volume to 1 000 ml.

3.5 Nitric acid ($\rho = 1,19$ g/ml approximately), solution approximately 6 N.

Dilute 400 ml of nitric acid ($\rho = 1,40$ g/ml approximately), solution approximately 15 N, with water, and make up the volume to 1 000 ml.

3.6 Sulphuric acid ($\rho = 1,26$ g/ml approximately), solution approximately 9 N.

Add carefully, while mixing and cooling, 255 ml of sulphuric acid ($\rho = 1,84$ g/ml approximately), solution approximately 35,6 N, to 600 ml of water. After cooling, make up the volume to 1 000 ml and mix.

3.7 Hydrofluoric acid ($\rho = 1,05$ g/ml approximately), solution approximately 40 % (m/m).

3.8 Sodium hydroxide, solution 240 g/l, approximately 6 N.

In a nickel crucible, dissolve 240 g of sodium hydroxide in water. After cooling, make up the volume to 1 000 ml and mix. Immediately transfer the solution to a plastics container.

3.9 Sodium hydroxide, solution 20 g/l, approximately 0,5 N.

In a nickel crucible, dissolve 20 g of sodium hydroxide in water. After cooling, make up the volume to 1 000 ml and mix. Immediately transfer the solution to a plastics container.

3.10 Ammonia solution ($\rho = 0,90$ g/ml approximately), solution 28 % (m/m) or approximately 14 N.

3.11 Ammonia solution ($\rho = 0,955$ g/ml approximately), solution approximately 6 N.

Dilute 425 ml of ammonia solution (3.10) with water and make up the volume to 1 000 ml.

3.12 Ammonia solution ($\rho = 0,99$ g/ml approximately), solution approximately 1 N.

Dilute 70 ml of ammonia solution (3.10) with water and make up the volume to 1 000 ml.