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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

**ISO RECOMMENDATION
R 1178**

CHEMICAL ANALYSIS OF MAGNESIUM AND ITS ALLOYS

**DETERMINATION OF SOLUBLE ZIRCONIUM
(ALIZARIN SULPHONATE PHOTOMETRIC METHOD)**

1st EDITION

January 1970

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BRIEF HISTORY

The ISO Recommendation R 1178, *Chemical analysis of magnesium and its alloys – Determination of soluble zirconium (Alizarin sulphonate photometric method)*, was drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question led to the adoption of a Draft ISO Recommendation.

In December 1968, this Draft ISO Recommendation (No. 1750) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Iran	Spain
Belgium	Israel	Sweden
Brazil	Italy	Switzerland
Canada	Netherlands	Thailand
Czechoslovakia	New Zealand	Turkey
Germany	Norway	U.A.R.
Greece	Peru	United Kingdom
Hungary	Poland	U.S.A.
India	South Africa, Rep. of	Yugoslavia

One Member Body opposed the approval of the Draft :

France

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in January 1970, to accept it as an ISO RECOMMENDATION.

CHEMICAL ANALYSIS OF MAGNESIUM AND ITS ALLOYS

DETERMINATION OF SOLUBLE ZIRCONIUM

(ALIZARIN SULPHONATE PHOTOMETRIC METHOD)

1. SCOPE

This ISO Recommendation describes an alizarin sulphonate photometric method for the determination of soluble zirconium in magnesium alloys containing zirconium as an alloying element. Rare earths, thorium and silver do not interfere.

The method is applicable to the determination of zirconium contents between 0.1 and 1.0 %.

However, the method does not apply completely to the case of alloys containing lead and/or bismuth, for which it must be modified as indicated in the Annex.

2. PRINCIPLE

- 2.1 Hydrochloric acid attack (the normality of the hydrochloric acid solution and the length of the attack have been conventionally fixed).
- 2.2 Removal, by filtration, of the insoluble residue and taking of an aliquot.
- 2.3 Formation, when hot, of the zirconium-alizarin sulphonate complex, in 1.5 N hydrochloric medium.
- 2.4 Photometric measurement of the coloured complex at a wavelength of about 525 nm.

3. REAGENTS

- 3.1 *Hydrochloric acid* ($d =$ approximately 1.18), 37 % (m/m), or approximately 12 N.

- 3.2 *Sodium alizarin sulphonate solution*, 1.5 g/l.

Dissolve 1.5 g of sodium alizarin sulphonate in about 300 ml of warm water, filter, cool and make up the volume to 1000 ml.

- 3.3 *Magnesium chloride solution*, 420 g/l.

Dissolve 42 g of magnesium chloride ($\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$) in water and make up the volume to 100 ml.

- 3.4 *Zirconium, standard solution*, 5 g/l.

Prepare this solution according to one of the following procedures :

- 3.4.1 Weigh, to the nearest 0.001 g, 0.500 g of pure zirconium ($\geq 99.9\%$) and transfer to a dry beaker. Add 30 ml of methanol and, while cooling, 5 ml of bromine. When the reaction has ceased, heat gently to complete the attack. Add 20 ml of hydrochloric acid (3.1), heat to boiling and continue boiling until a colourless solution is obtained, maintaining the volume of the solution at approximately 50 ml by adding water.

Cool and transfer quantitatively to a 100 ml volumetric flask and make up to volume.