

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1169

CHEMICAL ANALYSIS OF ZINC ALLOYS
VOLUMETRIC DETERMINATION OF ALUMINIUM

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BRIEF HISTORY

The ISO Recommendation R 1169, *Chemical analysis of zinc alloys – Volumetric determination of aluminium*, was drawn up by Technical Committee ISO/TC 18, *Zinc and zinc alloys*, the Secretariat of which is held by the Institut Belge de Normalisation (IBN).

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

In February 1968, this Draft ISO Recommendation (No. 1569) 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 | Ireland | Spain |
| Belgium | Israel | Sweden |
| Canada | Italy | Turkey |
| Czechoslovakia | Japan | U.A.R. |
| France | New Zealand | United Kingdom |
| Germany | Norway | U.S.A. |
| India | Poland | U.S.S.R. |
| Iran | South Africa, Rep. of | Yugoslavia |

No Member Body opposed the approval of the Draft.

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 ZINC ALLOYS

VOLUMETRIC DETERMINATION OF ALUMINIUM

1. SCOPE

This ISO Recommendation describes a volumetric method for the determination of aluminium in zinc alloys. The method applies to zinc alloys defined in ISO Recommendation R 301, *Zinc alloy ingots*, and to die castings made from these alloys.

2. PRINCIPLE OF THE METHOD

Addition of an excess of EDTA to the hydrochloric solution of the test portion. Quantitative complexing of the excess with a zinc solution. Decomposition of the aluminium-EDTA complex with sodium fluoride and titration of the liberated EDTA with a standard zinc solution.

3. REAGENTS

All the reagents should be of the analytical reagent grade.

Distilled or demineralized water should be used for preparing solutions and during the actual determination.

3.1 *Hydrochloric acid*, approximately 6 N.

3.2 *Hydrogen peroxide*, 30 % (m/m) H_2O_2 .

3.3 *Hydroxylammonium chloride solution*, 200 g/l.

3.4 *Ethylene diamine tetra-acetic acid disodium salt (EDTA) solution*.

Dissolve 65 g of EDTA in approximately 750 ml of warm water. Cool. Make up the volume to 1 litre.

3.5 *Methyl red solution*.

Dissolve 0.02 g of methyl red in 100 ml of ethanol.

3.6 *Ammonia solution* ($d = 0.91$).

3.7 *Buffer solution* at pH 5 to 5.5.

Dissolve 135 g of sodium acetate ($CH_3COONa \cdot 3H_2O$) in about 300 ml of water. Introduce 13 ml of glacial acetic acid (17 N). Check that the pH is within the range 5 to 5.5. Make up the volume to 500 ml with water.

3.8 *Xylenol orange solution*.

Dissolve 1 g of xylenol orange sodium salt in 100 ml of water.

3.9 *Standard zinc solution*, 0.05 M.

Dissolve 3.269 g of high purity zinc in 20 ml of hydrochloric acid (3.1) in a 250 ml beaker covered with a watchglass. Dilute with 100 ml of water. Add 2 drops of methyl red solution (3.5). Neutralize with ammonia solution (3.6). Add hydrochloric acid (3.1) dropwise until the colour changes to red. Transfer quantitatively to a 1 litre volumetric flask. Make up to volume with water. Mix.
1 ml of this solution corresponds to 1.349 mg of aluminium.

3.10 *Saturated sodium fluoride solution*.

Dissolve 60 g of sodium fluoride in 1 litre of boiling water. Cool. Filter.