
International Standard



4748

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Copper alloys — Determination of iron content — Na₂EDTA titrimetric method

Alliages de cuivre — Dosage du fer — Méthode titrimétrique au Na₂EDTA

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Foreword

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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 4748 was developed by Technical Committee ISO/TC 26, *Copper and copper alloys*, and was circulated to the member bodies in September 1982.

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

Belgium	Iran	Spain
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The member bodies of the following countries expressed disapproval of the document on technical grounds:

Australia
South Africa, Rep. of

Copper alloys — Determination of iron content — Na₂EDTA titrimetric method

1 Scope and field of application

This International Standard specifies a titrimetric method for the determination of the iron content of copper alloys.

The method is applicable to contents of iron in all types of copper alloys listed in International Standards.

2 Principle

Separation of iron from copper by extraction as the iron(III)-chloro complex, followed by chelation with excess EDTA at pH 4,5 and back-titration with a standard volumetric zinc solution.

3 Reagents

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

3.1 Hydrochloric acid, ρ 1,19 g/ml.

3.2 Hydrogen peroxide, 30 % (m/m) solution.

3.3 Methyl isobutyl ketone.

3.4 Ethanol.

3.5 Hydrochloric acid, diluted 1 + 1.

Dilute 100 ml of the hydrochloric acid (3.1) with 100 ml of water.

3.6 Lithium chloride, solution.

Dissolve 275 g of lithium chloride (LiCl) in water and dilute to 1 000 ml.

3.7 Ammonium fluoride, solution.

Dissolve 37 g of ammonium fluoride (NH₄F) in water and dilute to 1 000 ml.

3.8 Thiourea, solution.

Dissolve 100 g of thiourea (H₂NCSNH₂) in water and dilute to 1 000 ml.

3.9 Hexamethylenetetramine, solution.

Dissolve 200 g of hexamethylenetetramine in water and dilute to 1 000 ml.

3.10 Disodiumethylenediaminetetraacetate dihydrate (Na₂EDTA), 0,05 mol/l standard volumetric solution.

Dissolve 18,61 g of Na₂EDTA in water, dilute to the mark in a 1 000 ml one-mark volumetric flask, and mix. Standardize the solution by taking a known amount of the iron(III) solution (3.12) and, omitting only the extraction step, titrating as in clause 5.

3.11 Zinc, 0,05 mol/l standard volumetric solution.

Dissolve 3,269 g of high purity zinc metal with 25 ml of nitric acid (1 + 1). Expel nitrous oxides by boiling. Cool and adjust to pH 4 to 5 by addition of the hexamethylenetetramine solution (3.9). Dilute to the mark with water in a 1 000 ml one-mark volumetric flask and mix.

3.12 Iron(III), 0,05 mol/l solution.

Dissolve 3,992 g of iron(III) oxide (Fe₂O₃) with 40 ml of the hydrochloric acid solution (3.5). Dilute to the mark with water in a 1 000 ml one-mark volumetric flask and mix.

3.13 Xylenol orange.

Grind 1 g of xylenol orange with 100 g of potassium nitrate.

4 Apparatus

Ordinary laboratory apparatus, and

4.1 pH meter.

5 Procedure

5.1 Test portion

Weigh, to the nearest 0,001 g, 1,000 g of the sample into a 250 ml tall-form beaker.