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Copper and copper alloys — Determination of arsenic — Photometric method

Cuivre et alliages de cuivre — Dosage de l'arsenic — Méthode photométrique

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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 3220 was drawn up by Technical Committee ISO/TC 26, *Copper and copper alloys*, and circulated to the Member Bodies in June 1973.

It has been approved by the Member Bodies of the following countries :

Australia	Germany	Sweden
Austria	Ireland	Switzerland
Belgium	Japan	Thailand
Bulgaria	Mexico	Turkey
Canada	New Zealand	United Kingdom
Chile	Norway	U.S.A.
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Finland	Romania	
France	South Africa, Rep. of	

No Member Body expressed disapproval of the document.

Copper and copper alloys — Determination of arsenic — Photometric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a photometric method for the determination of arsenic in copper and copper alloys.

The method is applicable for the determination of arsenic as an alloying element or as an impurity in copper and all types of copper alloys listed in ISO Recommendations or International Standards.

2 PRINCIPLE

Extraction of arsenic from a hydrochloric, hydrobromic and perchloric acid-containing solution using benzene. After re-extraction with water, photometric determination as molybdenum blue.

Phosphorus and silicon in milligram amounts do not interfere.

3 REAGENTS

All the reagents shall be of analytical grade. Distilled or deionized water shall be used.

3.1 Benzene.

3.2 Hydrochloric acid ρ 1,19 g/ml.

3.3 Hydrobromic acid ρ 1,5 g/ml.

3.4 Perchloric acid ρ 1,67 g/ml.

3.5 Chloric acid.

3.6 Hydrochloric acid, 6 N.

Dilute 100 ml of hydrochloric acid (ρ 1,19 g/ml) with 100 ml of water.

3.7 Sulphuric acid solution.

Dilute 95 ml of sulphuric acid (ρ 1,84 g/ml) with water to 2 000 ml.

3.8 Ascorbic acid solution.

Dissolve 2 g of ascorbic acid in 100 ml of water; use freshly prepared solutions.

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

3.10 Potassium permanganate, 0,1 N solution.

3.11 Molybdate solution.

Dissolve 0,95 g of ammonium heptamolybdate, $[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24}\cdot 4\text{H}_2\text{O}]$, in 200 ml of the sulphuric acid (3.7); use freshly prepared solutions.

3.12 Arsenic stock solution.

Dissolve 132 mg of arsenious oxide (As_2O_3) with 10 ml of sodium hydroxide, (NaOH), 1 N, in a polyethylene beaker, add 12,5 ml of hydrochloric acid (HCl), 1 N, and dilute in a 250 ml volumetric flask with water to the mark.

3.13 Arsenic standard solution.

Add to 25 ml of the arsenic stock solution (3.12) in a 500 ml volumetric flask 20 ml of the hydrochloric acid (3.6) and dilute with water to the mark. (1 ml is equivalent to 20 μg of arsenic.)

4 APPARATUS

4.1 Normal laboratory apparatus

4.2 Photometer.

5 SAMPLING

Carry out the sampling in accordance with the requirements of ISO ...¹⁾

6 PROCEDURE

Test portion mass for arsenic contents up to 0,02 % : 2,00 g.

1) In preparation.