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# International Standard 5956

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## Copper and copper alloys — Determination of antimony content — Rhodamine B spectrometric method

*Cuivre et alliages de cuivre — Dosage de l'antimoine — Méthode spectrométrique à la rhodamine B*

First edition — 1984-04-15

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UDC 669.3 : 543.42 : 546.86

Ref. No. ISO 5956-1984 (E)

**Descriptors** : copper, copper alloys, chemical analysis, determination of content, antimony spectrometric analysis.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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 5956 was developed by Technical Committee ISO/TC 26, *Copper and copper alloys*, and was circulated to the member bodies in August 1982.

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

|                     |                        |                       |
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The member bodies of the following countries expressed disapproval of the document on technical grounds :

Australia  
Chile

# Copper and copper alloys — Determination of antimony content — Rhodamine B spectrometric method

## 1 Scope and field of application

This International Standard specifies a Rhodamine B spectrometric method for the determination of the antimony content of copper and copper alloys.

The method is applicable to antimony contents between 0,001 and 0,1 % (*m/m*) in all types of copper and copper alloys listed in International Standards. The range of application may be extended by appropriate modification of the mass of the test portion, the extraction volume and the cell path length. Specific proposals to cover lower and higher concentrations are in preparation.

## 2 Principle

Extraction of pentavalent antimony into isopropyl ether and spectrometric determination of the chloroantimonate-Rhodamine B complex.

## 3 Reagents

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

### 3.1 Isopropyl ether.

### 3.2 Hydrochloric acid, $\rho$ 1,19 g/ml.

### 3.3 Hydrogen peroxide, 30 % (*m/m*).

### 3.4 Hydrochloric acid, solution, diluted 7 + 3.

Mix 700 ml of the hydrochloric acid (3.2) with 300 ml of water.

### 3.5 Cerium(IV) sulfate, solution.

Dissolve 4 g of cerium(IV) sulfate tetrahydrate  $[\text{Ce}(\text{SO}_4)_2 \cdot 4\text{H}_2\text{O}]$  and dilute to 100 ml with 0,5 mol/l sulfuric acid solution.

### 3.6 Hydroxylammonium chloride, solution.

Dissolve 1 g of hydroxylammonium chloride ( $\text{NH}_2\text{OH} \cdot \text{HCl}$ ) in water and dilute to 100 ml.

Use a freshly prepared solution only.

### 3.7 Hydrochloric acid, 1 mol/l solution.

Dilute 83 ml of the hydrochloric acid (3.2) to 1 000 ml with water.

### 3.8 Rhodamine B, solution.

Dissolve 0,01 g of Rhodamine B and dilute to 100 ml with the hydrochloric acid solution (3.7).

Filter the solution before use.

### 3.9 Antimony, standard solution corresponding to 1,000 g of Sb per litre.

Dissolve 0,274 3 g of potassium antimonyl tartrate hemihydrate  $[\text{K}(\text{SbO})\text{C}_4\text{H}_4\text{O}_6 \cdot 0,5\text{H}_2\text{O}]$  and make up to volume with the hydrochloric acid solution (3.4) in a 100 ml one-mark volumetric flask.

1 ml of this standard solution contains 1,000 mg of Sb.

### 3.10 Antimony, standard solution corresponding to 100 mg of Sb per litre.

Dilute 10 ml of the antimony standard solution (3.9) to the mark with the hydrochloric acid solution (3.4) in a 100 ml one-mark volumetric flask.

1 ml of this standard solution contains 100  $\mu\text{g}$  of Sb.

## 4 Apparatus

Ordinary laboratory apparatus, and

### 4.1 Refrigeration cupboard.

### 4.2 Spectrometer.