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**INTERNATIONAL STANDARD**



**2215**

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**Boric acid, boric oxide and *Disodium* tetraborates  
for industrial use — Determination of copper content —  
Zinc dibenzoyldithiocarbamate photometric method**

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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 2215 was drawn up by Technical Committee ISO/TC 47, *Chemistry*.

It was approved in August 1971 by the Member Bodies of the following countries :

Austria	Israel	Sweden
Belgium	Italy	Switzerland
Czechoslovakia	Netherlands	Thailand
Egypt, Arab Rep. of	New Zealand	Turkey
France	Poland	United Kingdom
Germany	Portugal	U.S.A.
Hungary	Romania	U.S.S.R.
India	South Africa, Rep. of	Yugoslavia
Ireland	Spain	

No Member Body expressed disapproval of the document.

# Boric acid, boric oxide and *Disodium* tetraborates for industrial use – Determination of copper content – Zinc dibenzylthiocarbamate photometric method

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a zinc dibenzylthiocarbamate method for the photometric determination of the copper content of boric acid, boric oxide and *disodium* tetraborates for industrial use.

## 2 PRINCIPLE

Formation of a coloured complex between the copper and zinc dibenzylthiocarbamate and photometric measurement at a wavelength of approximately 435 nm.

## 3 REAGENTS

Distilled water or water of equivalent purity shall be used in the test.

### 3.1 Carbon tetrachloride, redistilled.

**3.2 Hydrochloric acid**, approximately 6 N solution, freed from copper by extraction with the zinc dibenzylthiocarbamate solution (3.3).

**3.3 Zinc dibenzylthiocarbamate**, 0.5 g/l solution in carbon tetrachloride.

Dissolve 0.05 g of zinc dibenzylthiocarbamate in the carbon tetrachloride (3.1) and dilute to 100 ml with the same carbon tetrachloride.

**3.4 Copper standard solution**, containing 0.10 g/l of Cu.

Weigh, to the nearest 0.000 1 g, 0.1 g of electrolytic copper and dissolve in 10 ml of approximately 8 N nitric acid solution. Heat the solution on a hot plate until the fumes evolved are no longer brown, cool and add about 100 ml of water. Transfer quantitatively to a 1 000 ml one-mark volumetric flask, dilute to the mark and mix.

1 ml of this solution contains 0.10 mg of Cu.

**3.5 Copper standard solution**, containing 0.010 g/l of Cu.

Transfer 10.0 ml of the copper standard solution (3.4) to a 100 ml one-mark volumetric flask, dilute to the mark and mix.

1 ml of this standard solution contains 10  $\mu$ g of Cu.

Prepare this solution just before use.

## 4 APPARATUS

Ordinary laboratory apparatus and

**4.1 Spectrophotometer**, with 4 cm cells, or

**4.2 Photoelectric absorptiometer**, with 4 cm cells.

## 5 PROCEDURE

### 5.1 Test portion

Weigh, to the nearest 0.1 g, a mass of the test sample as indicated in the following table :

Material	Mass, in grams, of test portion
boric acid (H <sub>3</sub> BO <sub>3</sub> )	10
boric oxide (B <sub>2</sub> O <sub>3</sub> )	5
<i>disodium</i> tetraborate decahydrate (Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> ·10H <sub>2</sub> O)	15
<i>disodium</i> tetraborate pentahydrate (Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> ·5H <sub>2</sub> O)	10
anhydrous <i>disodium</i> tetraborate (Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> )	10

### 5.2 Blank test

At the same time as the analysis, carry out a blank test using the same procedure and quantities of all reagents employed in the determination.