INTERNATIONAL STANDARD 2215

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Boric acid, boric oxide and *Di*sodium tetraborates for industrial use — Determination of copper content — Zinc dibenzyldithiocarbamate photometric method

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FOREWORD

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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.
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Ireland	Spain	

No Member Body expressed disapproval of the document.

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Boric acid, boric oxide and *Di*sodium tetraborates for industrial use — Determination of copper content — Zinc dibenzyldithiocarbamate photometric method

1 SCOPE AND FIELD OF APPLICATION

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

2 PRINCIPLE

Formation of a coloured complex between the copper and zinc dibenzyldithiocarbamate 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 dibenzyldithiocarbamate solution (3.3).

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

Dissolve 0.05 g of zinc dibenzyldithiocarbamate 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 μg 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_3BO_3)	10
boric oxide	(B_2O_3)	5
*di*sodium tetraborate decahydrate	($Na_2B_4O_7 \cdot 10H_2O$)	15
*di*sodium tetraborate pentahydrate	($Na_2B_4O_7 \cdot 5H_2O$)	10
anhydrous disodium tetraborate	($Na_2B_4O_7$)	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.