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Boric acid for industrial use — Determination of boric acid content — Volumetric 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 1914 was drawn up by Technical Committee ISO/TC 47, *Chemistry.*

It was approved in July 1970 by the Member Bodies of the following countries:

Australia	Hungary	South Africa, Rep. of
Austria	India	Spain
Belgium	Israel	Switzerland
Chile	Japan	Thailand
Czechoslovakia	Netherlands	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
France	Poland	U.S.S.R.
Germany	Portugal	
Greece	Romania	

No Member Body expressed disapproval of the document.

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Boric acid for industrial use — Determination of boric acid content — Volumetric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a volumetric method for the determination of the boric acid content of boric acid for industrial use.

2 PRINCIPLE

Titration of a dissolved test portion with a standard volumetric solution of sodium hydroxide in the presence of mannitol or sorbitol, using phenolphthalein as indicator.

3 REAGENTS

Distilled water or water of equivalent purity, free from carbon dioxide, shall be used in the test.

3.1 Mannitol, neutral, or alternatively **sorbitol,** neutral.

These products shall satisfy the following condition :

5.0 g, dissolved in 50 ml of carbon dioxide-free water, requires for neutralization not more than 0.3 ml of 0.02 N sodium hydroxide solution using phenolphthalein solution as indicator.

3.2 Hydrochloric acid, 0.25 N standard volumetric solution.

3.3 Sodium hydroxide, 0.5 N standard volumetric solution, free from carbonate.

3.4 Phenolphthalein, 10 g/l ethanolic solution.

Dissolve 1 g of phenolphthalein in 95 % (V/V) ethanol, dilute to 100 ml with the same ethanol and add 0.02 N sodium hydroxide solution until the first appearance of a pink colour.

4 APPARATUS

Ordinary laboratory apparatus.

5 SAMPLING

Follow the principles described in ISO ....[1].

6 PROCEDURE

6.1 Test portion

Weigh, to the nearest 0.001 g, about 1 g of the laboratory sample.

6.2 Determination

Transfer the test portion (6.1) to a beaker and dissolve in about 120 ml of water by heating, avoiding boiling. Cool the solution to ambient temperature, add approximately 15 g of the mannitol or sorbitol (3.1) and 0.4 ml of the phenolphthalein solution (3.4). Titrate the solution with the sodium hydroxide solution (3.3) to a distinct pink colour.

NOTE — To ensure that the correct titration end point is obtained, the following standard colour matching solution may be used for comparison with the solution being titrated.

Mix

- 50 ml of a 3.81 g/l solution of disodium tetraborate decahydrate ($Na_2B_4O_7.10H_2O$),
- 100 ml of water,
- 2.0 ml of the hydrochloric acid solution (3.2),
- 0.4 ml of the phenolphthalein solution (3.4).

Equal volumes of this solution and of the titrand shall be compared in similar beakers.

7 EXPRESSION OF RESULTS

Boric acid content (H_3BO_3) is given, as a percentage by mass, by the formula :

$$\frac{V}{m} \times 3.092$$

where

V is the volume, in millilitres, of the sodium hydroxide solution (3.3) used in the titration;

m is the mass, in grams, of the test portion.

8 TEST REPORT

The test report shall include the following particulars :

a) the reference of the method used;

b) the results and the method of expression used;

c) any unusual features noted during the determination;

d) any operation not included in this International Standard or regarded as optional.

1) Under study.