INTERNATIONAL STANDARD 1916

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Disodium tetraborates for industrial use — Determination of sodium oxide and boric oxide contents and loss on ignition

First edition — 1972-05-15

UDC 661.652 : 543

Ref. No. ISO 1916-1972 (E)

Descriptors : boron oxides, chemical analysis, determination of content, moisture content, sodium borates, sodium oxides, volumetric analysis.

Price based on 2 pages

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 1916 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	Romania
Belgium	India	South Africa, Rep. of
Chile	Israel	Spain
Czechoslovakia	Japan	Switzerland
Egypt, Arab Rep. of	Netherlands	Thailand
France	New Zealand	Turkey
Germany	Poland	United Kingdom
Greece	Portugal	U.S.S.R.

No Member Body expressed disapproval of the document.

Printed in Switzerland

Disodium tetraborates for industrial use — Determination of sodium oxide and boric oxide contents and loss on ignition

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies methods for the determination of the sodium oxide and boric oxide contents and of the loss on ignition of disodium tetraborates for industrial use, in their various states of hydration.

2 PRINCIPLE

Determination of the sodium oxide content by addition of an excess of a solution of hydrochloric acid and back titration with a standard volumetric solution of sodium hydroxide, using screened methyl red as indicator.

Subsequent titration of the boric oxide with the standard volumetric solution of sodium hydroxide in the presence of mannitol or sorbitol, using phenolphthalein as indicator.

Determination of the loss on ignition at 900 °C, expressed conventionally as the water content.

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 using phenolphthalein solution as indicator.

3.2 Hydrochloric acid, 0.5 N standard volumetric solution.

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

3.4 Screened methyl red, indicator solution.

Dissolve 0.01 g of methyl red and 0.01 g of bromocresol green in 95 % (V/V) ethanol and dilute to 100 ml with the same ethanol.

3.5 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 and

4.1 Platinum crucible, 35 mm diameter and 40 mm deep, with lid.

4.2 Electric furnace, capable of being controlled at 900 ± 50 °C.

5 SAMPLING

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

6 PROCEDURE

6.1 Test portion

For the determinations indicated, the mass of the laboratory sample to be taken and the precision of the weighing are given in the following Table :

TABLE — Mass of the test portion and precision of the weighing

Presumed state of hydration	Determination of sodium oxide and boric oxide		Determination of loss on ignition	
molecules of water	mass of test portion g	precision of weighing g	mass of test portion g	precision of weighing g
0 (anhydrous)	0.5	± 0.000 5	2.0	± 0.000 2
5	1.0	± 0.000 5	1.0	± 0.000 5
10	1.0	± 0.000 5	1.0	± 0.000 5

6.2 Determination of sodium oxide content

Dissolve the test portion (6.1) in about 70 ml of water by heating. Cool the solution to ambient temperature and add 0.4 ml of the screened methyl red indicator solution (3.4). Add 25.0 ml of the hydrochloric acid solution (3.2). Titrate with the sodium hydroxide solution (3.3) until the solution is just yellow. Retain this solution for the determination of boric oxide content (see 6.3).

At the same time determine the equivalence of the two solutions (3.2) and (3.3) as follows :

1) Under study.