INTERNATIONAL STANDARD 1917

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

Hydrated sodium perborates for industrial use — Determination of sodium oxide, boric oxide and available oxygen contents — Volumetric methods

First edition — 1972-05-15

UDC 661.652 : 543

Ref. No. ISO 1917-1972 (E)

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

Price based on 2 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (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 set up 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 1917 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

Hydrated sodium perborates for industrial use — Determination of sodium oxide, boric oxide and available oxygen contents — Volumetric methods

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies volumetric methods for the determination of the sodium oxide, boric oxide and available oxygen contents of hydrated sodium perborates for industrial use.

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 available oxygen content by titration in acid solution with a standard volumetric potassium permanganate solution.

3 REACTION

The reaction involved in the determination of available oxygen is the following:

$$2\,MnO_4^- + 6\,H^+ + 5\,O = 2\,Mn^{2+} + 5\,O_2 + 3\,H_2O$$

4 REAGENTS

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

4.1 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.

4.2 Hydrochloric acid, 0.5 N standard volumetric solution.

4.3 Sulphuric acid, approximately 4 N solution.

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

4.5 Potassium permanganate, 0.1 N standard volumetric solution.

4.6 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.

4.7 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.

5 APPARATUS

Ordinary laboratory apparatus.

6 SAMPLING

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

7 PROCEDURE

7.1 Determination of sodium oxide and boric oxide contents

7.1.1 *Test portion*

Weigh, to the nearest 0.000 5 g, 2 g of sodium perborate tetrahydrate or 1.5 g of sodium perborate monohydrate.

7.1.2 *Determination of sodium oxide content*

Dissolve the test portion (7.1.1) in about 100 ml of water and add 0.4 ml of the screened methyl red indicator solution (4.6). Add 25.0 ml of the hydrochloric acid solution (4.2). Titrate with the sodium hydroxide solution (4.4) until the solution is just yellow. Retain this solution for the determination of boric oxide content (see 7.1.3).

1) Under study.