INTERNATIONAL STANDARD 2198

G-92-21

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

Sodium hydrogen carbonate for industrial use — Determination of sodium carbonate — Titrimetric method

First edition — 1972-08-01

UDC 661.321.8 : 546.33'264 : 543.24

Ref. No. ISO 2198-1972 (E)

Descriptors : sodium carbonates, chemical analysis, determination of content, 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 2198 was drawn up by Technical Committee ISO/TC 47, *Chemistry*.

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

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

The Member Bodies of the following countries expressed disapproval of the document on technical grounds:

France
India

Printed in Switzerland

INTERNATIONAL STANDARD ISO 2198-1972 (E)

Sodium hydrogen carbonate for industrial use — Determination of sodium carbonate — Titrimetric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a titrimetric method for the determination of sodium carbonate in sodium hydrogen carbonate for industrial use. This method is applicable to products having a sodium carbonate content greater than 0.02 % (m/m).

2 PRINCIPLE

Dissolution, in a specified volume of sodium chloride solution saturated at 20 °C, of the total sodium carbonate present in the test portion and of a relatively small more or less constant quantity of sodium hydrogen carbonate, which corresponds to saturation under the prevailing conditions.

Filtration of the insoluble matter which constitutes the major part of the sodium hydrogen carbonate.

Titration, in an aliquot part of the filtrate, of the total alkalinity, which corresponds to the sodium carbonate and to the more or less constant soluble part of the sodium hydrogen carbonate.

Determination of the sodium carbonate content by reference to the attached graph, which gives a direct reading of the difference between the total alkalinity and that part, more or less constant, due to the sodium hydrogen carbonate.

3 REAGENTS

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

3.1 Sodium chloride.

3.2 Sodium chloride, solution saturated at 20 °C.

Place 150 g of sodium chloride (3.1) and 400 ml of water in a 700 ml flat bottom flask. Immerse the flask in the water bath (4.1) set at 20 ± 0.2 °C, and stir from time to time. Decant and use the supernatant solution, ensuring that it is quite neutral to bromophenol blue (3.4).

3.3 Hydrochloric acid, 0.1 N standard volumetric solution.

3.4 Bromophenol blue, 1 g/l solution in 95 % (V/V) ethanol.

4 APPARATUS

Ordinary laboratory apparatus and

4.1 Water bath, thermostatically controlled at 20 ± 0.2 °C.

4.2 Conical flasks, capacity 100 ml, with ground glass stoppers.

4.3 Sintered glass crucibles, porosity grade P40 (pore size index 16 — 40 μm).

4.4 Filter flask, capacity 500 ml.

5 PROCEDURE

5.1 Test portion

Weigh, to the nearest 0.01 g, 25 g of the test sample.

5.2 Determination

Place the test portion (5.1) in a perfectly dry conical flask (4.2), add 2 g of the sodium chloride (3.1) and 25.0 ml of the sodium chloride solution (3.2). Place the stopper in the conical flask, shake it vigorously and immerse it in the water bath (4.1) controlled at 20 ± 0.2 °C for 30 min, shaking it frequently.

Filter through the sintered glass crucible (4.3), collecting the filtrate in a filter flask (4.4), also dry. Take a 10.0 ml portion of the filtrate, which should be *perfectly clear,* and transfer it to a 250 ml conical flask. Add 50 ml of water and 5 drops of the bromophenol blue solution (3.4). Titrate the alkalinity with the standard volumetric hydrochloric acid solution (3.3) until the indicator changes colour from blue to yellow.

NOTE — If the volume of the standard solution used exceeds 32 ml, the determination should be repeated with a reduced quantity of sample in order to be certain of dissolving the whole of the sodium carbonate.

6 EXPRESSION OF RESULTS

The sodium carbonate content is given, as a percentage by mass, by the formula :

$$m_1 \times \frac{25}{10} \times \frac{100}{m_0} = \frac{250\, m_1}{m_0}$$

where

m_0 is the mass, in grams, of the test portion;

m_1 is the mass, in grams, deduced from the attached graph, of sodium carbonate corresponding to the volume of standard volumetric hydrochloric acid solution (3.3) used for the titration.

Express the result to two decimal places.

7 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.

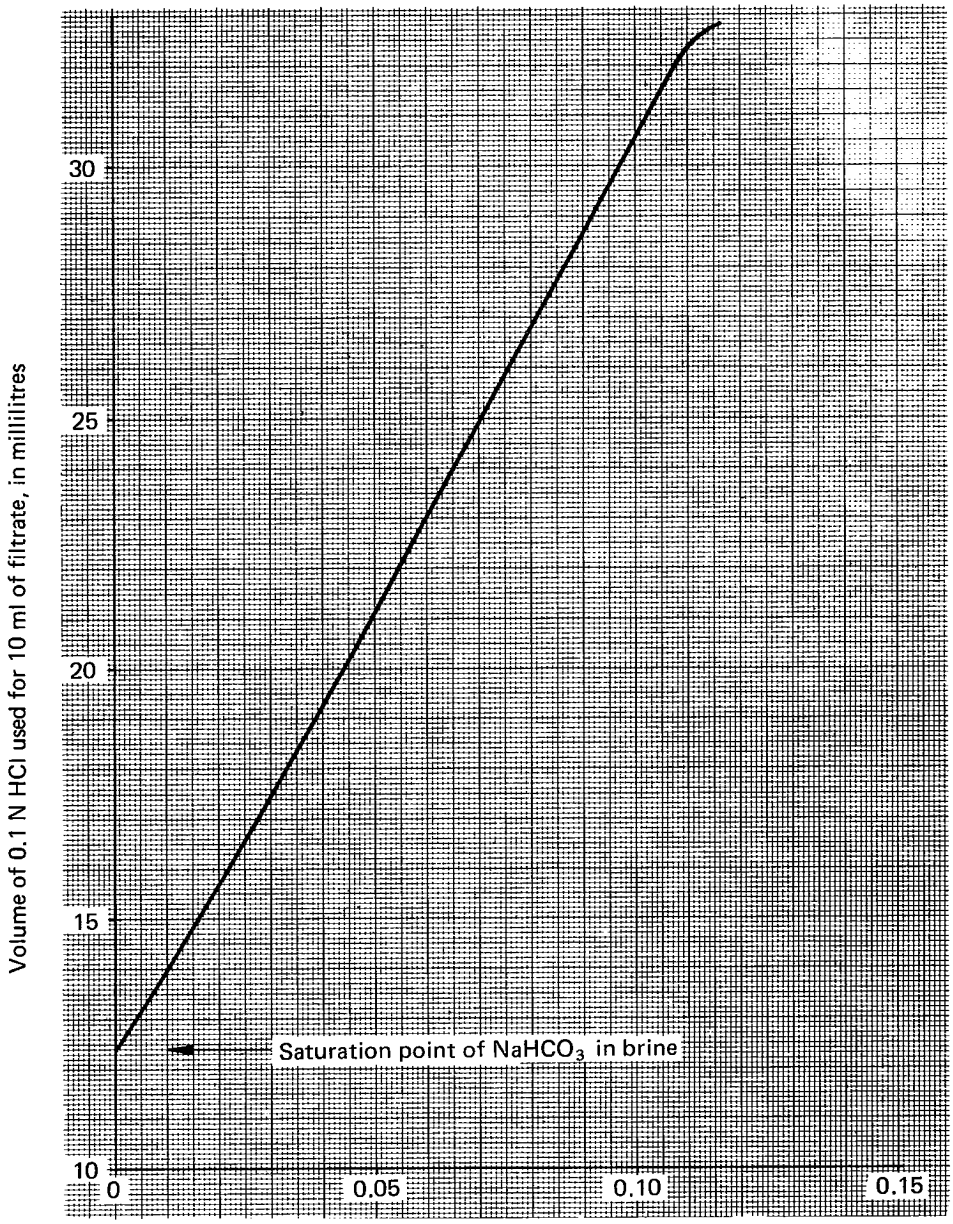

FIGURE — Graph obtained with saturated brine at 20 °C