INTERNATIONAL STANDARD 745

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Sodium carbonate for industrial use — Determination of loss of mass and of non-volatile matter at 250 °C

Carbonate de sodium à usage industriel — Détermination de la perte de masse et de la matière fixe à 250 °C

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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.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 47 has reviewed ISO Recommendation R 745 and found it technically suitable for transformation. International Standard ISO 745 therefore replaces ISO Recommendation R 745-1968 to which it is technically identical.

ISO Recommendation R 745 was approved by the Member Bodies of the following countries :

Austria	India	Romania
Belgium	Israel	South Africa, Rep. of
Brazil	Italy	Spain
Chile	Japan	Switzerland
Czechoslovakia	Korea, Rep. of	Turkey
Egypt, Arab Rep. of	Netherlands	United Kingdom
France	New Zerland	U.S.A.
Germany	Poland	U.S.S.R.
Hungary	Portugal	Yugoslavia

No Member Body expressed disapproval of the Recommendation.

No Member Body disapproved the transformation of ISO/R 745 into an International Standard.

Printed in Switzerland

Sodium carbonate for industrial use — Determination of loss of mass and of non-volatile matter at 250 °C

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the loss of mass and of non-volatile matter at 250 °C of anhydrous sodium carbonate for industrial use.

1.1 Special case

Sodium carbonate decahydrate.

2 REFERENCE

ISO 739, *Sodium carbonate for industrial use — Preparation and storage of test samples.*

3 PRINCIPLE

Heating of thin layers of a test portion to constant mass at 250 °C.

The loss of mass represents water in its various forms plus half the carbon dioxide content of the hydrogen carbonate present.

The residue constitutes the non-volatile matter at 250 °C.

4 APPARATUS

Ordinary laboratory apparatus and

4.1 Weighing bottle, of capacity approximately 100 ml and diameter approximately 75 mm, with ground glass stopper.

4.2 Electric oven, capable of reaching a temperature of at least 250 °C, capable of being regulated so as not to exceed a temperature of 270 °C.

5 PROCEDURE

5.1 Test portion

Weigh, to the nearest 0,000 1 g, 5 ± 0,1 g of the test sample (see ISO 739).

5.2 Determination

Spread thin layers of the test portion (5.1) in the weighing bottle (4.1) previously dried for 30 min in the oven (4.2) controlled at a temperature of 250 °C, allowed to cool to room temperature in a desiccator and weighed to the nearest 0,000 1 g.

In the oven (4.2) controlled at a starting temperature not exceeding 100 °C, place the weighing bottle containing the test portion (5.1), with the ground glass stopper of the weighing bottle placed slantwise, together with a watch-glass of diameter slightly greater than that of the weighing bottle. Increase the temperature progressively to at least 250 °C and maintain this temperature for 3 h. Do not allow the temperature to exceed 270 °C.

Replace the stopper by the watch-glass and place the weighing bottle and watch-glass in a desiccator. After cooling to ambient temperature, insert the stopper in the weighing bottle and weigh to the nearest 0,000 1 g.

6 EXPRESSION OF RESULTS

The loss of mass at 250 °C, expressed as a percentage by mass, is given by the formula :

$$(m_1 - m_2) \times \frac{100}{m_0}$$

The non-volatile matter at 250 °C, expressed as a percentage by mass, is given by the formula :

$$100 - \frac{(m_1 - m_2) \times 100}{m_0}$$

where

m_0 is the mass, in grams, of the test portion (5.1);

m_1 is the mass, in grams, of the test portion and weighing bottle before heating;

m_2 is the mass, in grams, of the test portion and weighing bottle after heating.

7 SPECIAL CASE

7.1 Principle

When sodium carbonate decahydrate (soda crystals) is being analysed, the temperature shall be raised slowly in order to avoid loss through sputtering.

7.2 Apparatus

See clause 4.

7.3 Procedure

7.3.1 *Test portion*

See 5.1.

7.3.2 *Determination*

In the cold oven (4.2), place the weighing bottle (4.1) containing the test portion (7.3.1), covered with a perforated watch-glass, together with the ground glass stopper and a watch-glass of diameter slightly greater than that of the weighing bottle.

Gradually raise the temperature to approximately 95 °C and maintain this temperature until the product is apparently dry. Then gradually increase the temperature to at least 250 °C but do not allow it to exceed 270 °C, and maintain this temperature for 3 h.

Replace the perforated watch-glass by the other watch-glass and place the weighing bottle, thus covered, and its ground glass stopper, in a desiccator.

After cooling to ambient temperature, insert the stopper in the weighing bottle, and weigh to the nearest 0,000 1 g.

7.4 Expression of results

See clause 6.

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 in the International Standard to which reference is made, or regarded as optional.

ANNEX

ISO PUBLICATIONS RELATING TO SODIUM CARBONATE FOR INDUSTRIAL USE

ISO 739 — Preparation and storage of test samples.

ISO 740 — Determination of total soluble alkalinity — Titrimetric method.

ISO 741 — Determination of sodium hydrogen carbonate content — Titrimetric method.

ISO 742 — Determination of chloride content — Mercurimetric method.

ISO 743 — Determination of sulphate content — Barium sulphate gravimetric method.

ISO 744 — Determination of iron content — 1,10-phenanthroline photometric method.

ISO 745 — Determination of loss of mass and of non-volatile matter at 250 °C.

ISO 746 — Determination of matter insoluble in water at 50 °C.