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International Standard



6353/2

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

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Reagents for chemical analysis — Part 2 : Specifications — First series

Réactifs pour analyse chimique — Partie 2 : Spécifications — Première série

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Descriptors : chemical analysis, chemical reagents, specifications, tests.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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 6353/2 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in August 1981.

It has been approved by the member bodies of the following countries :

Austria	Hungary	Poland
Belgium	Ireland	Portugal
Brazil	Italy	Romania
China	Japan	South Africa, Rep. of
Czechoslovakia	Korea, Dem. P. Rep. of	Switzerland
Egypt, Arab Rep. of	Korea, Rep. of	United Kingdom
France	Netherlands	
Germany, F. R.	Philippines	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

India
USSR



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Reagents for chemical analysis — Part 2: Specifications — First series

Réactifs pour analyses chimiques — Partie 2: Spécifications — Première série

ADDENDUM 2

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

Addendum 2 to International Standard ISO 6353/2-1983 was prepared by Technical Committee ISO/TC 47, *Chemistry*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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PS 30 Sodium carbonate, primary standard Na_2CO_3

Relative molecular mass: 105,988

PS 30.1 Specification

Assay (Na_2CO_3 , after drying at 285 °C) ... 99,95 to 100,05 %

The mean value of the assay shall be in the range 99,95 to 100,05 % and the standard deviation shall not exceed $\pm 0,05$ %.

All other properties shall comply with the requirements for reagent R 30.

PS 30.2 Test

PS 30.2.1 Standardization of hydrochloric acid solution, $c(\text{HCl}) = 1$ mol/l

Weigh, to the nearest 0,000 1 g, about 1,9 g of electrolytic silver (99,995 %), and dissolve it in 10 ml of nitric acid (R 19) by gently heating. Cool and dilute to about 80 ml with water. Titrate with hydrochloric acid solution, $c(\text{HCl}) \approx 1$ mol/l, according to GM 31.2. Use a potentiometer accurate to ± 1 mV and a 25 ml burette graduated in 0,05 ml divisions and complying with class A of ISO 385/1. Operate at the calibration temperature of the burette (for example 20 ± 1 °C).

The concentration c , in moles of HCl per litre, of the hydrochloric acid solution is given by the equation

$$c = \frac{m_1}{0,107\ 87\ V_1}$$

where

m_1 is the mass, in grams, of electrolytic silver weighed;

V_1 is the volume, in millilitres, of hydrochloric acid solution used for the titration;

Carry out ten titrations and calculate the mean value.

PS 30.2.2 Determination of sodium carbonate

Dry the sodium carbonate at 285 °C for at least 2 h, then place it in a desiccator for 30 min.

Weigh, to the nearest 0,000 1 g, about 0,93 g of the sodium carbonate, and dissolve it in 150 ml of water. Add, using a 25 ml burette graduated in 0,05 ml divisions and complying with class A of ISO 385/1, 16,00 ml of the hydrochloric acid solution, cautiously and while stirring, and then heat to boiling. Cool and titrate, using the same burette, with the same hydrochloric acid solution according to GM 31.2. Use the same potentiometer, accurate as in PS 30.2.1. Operate at the calibration temperature of the burette (for example 20 ± 1 °C).

The assay, expressed as a percentage by mass of Na_2CO_3 , is given by the formula

$$\frac{5,299\ 4\ V_2\ c}{m_2}$$

where

V_2 is the total volume, in millilitres, of hydrochloric acid solution used for the determination;

c is the concentration, in moles of HCl per litre, of hydrochloric acid solution used;

m_2 is the mass, in grams, of sodium carbonate weighed.

Carry out at least ten titrations and calculate the mean value \bar{x} and the standard deviation s , using the following equations:

$$\bar{x} = \frac{\sum_{i=1}^N x_i}{N}$$

and

$$s = \sqrt{\frac{\sum_{i=1}^N (x_i - \bar{x})^2}{N - 1}}$$

where

x_i is an individual value;

N is the number of values measured.

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Reagents for chemical analysis — Part 2 : Specifications — First series

1 Scope and field of application

This part of ISO 6353 gives specifications and indicates the test methods to be used for checking conformity with these specifications for a first series of reagents used in analytical chemistry.

This document should be read in conjunction with ISO 6353/1 which describes the general test methods (GM) applicable to the requirements of the reagent specifications and gives such general information as is required for the correct use of the standard.

Particular attention is drawn to ISO 6353/1, clause 4, which describes the preparation of

- standard solutions (SS) at dilutions I, II and III;

- reagents solutions (RS);
- indicator solutions (IS).

In this part of ISO 6353, asterisked clause reference numbers refer to ISO 6353/1.

2 Reagents (abbreviation : R), Specifications — First series

General remark — In all tests involving comparison with a standard matching solution, the result (for example colour intensity) obtained on the test solution shall not be greater than that obtained on the specified standard matching solution.