Publié 1986-11-15

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

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.

UDC 543.4 **Ref. No. ISO 6353/2-1983/Add.2-1986 (E)**

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

Price based on 1 page

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 ±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(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(HCl) ≈ 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.