INTERNATIONAL STANDARD ISO 5785

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Hydrochloric acid for industrial use — Determination of arsenic content — Silver diethyldithiocarbamate photometric method

Acide chlorhydrique à usage industriel — Dosage de l'arsenic — Méthode photométrique au diéthyldithiocarbamate d'argent

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FOREWORD

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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 5785 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in February 1977.

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

Australia	Germany	Romania
Austria	Hungary	South Africa, Rep. of
Belgium	Israel	Switzerland
Brazil	Italy	Turkey
Bulgaria	Mexico	United Kingdom
Chile	Netherlands	Yugoslavia
Czechoslovakia	Poland	
France	Portugal	

No member body expressed disapproval of the document.

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Hydrochloric acid for industrial use — Determination of arsenic content — Silver diethyldithiocarbamate photometric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a silver diethyldithiocarbamate photometric method for the determination of the arsenic content of hydrochloric acid for industrial use.

The method is applicable to products having arsenic (As) contents equal to or greater than 0,1 mg/kg.

2 REFERENCE

ISO 2590, *General method for the determination of arsenic — Silver diethyldithiocarbamate photometric method.*

3 PRINCIPLE

See ISO 2590, clause 3.

4 REAGENTS

See ISO 2590, clause 4.

5 APPARATUS

See ISO 2590, clause 5.

6 PROCEDURE

WARNING — See ISO 2590, clause 6.

6.1 Test portion

Weigh, to the nearest 0,001 g, 10 to 12 g of the test sample.

6.2 Preparation of the test solution

6.2.1 If the test portion (6.1) contains from 1 to 20 µg of As, introduce it into the conical flask (5.1.1) of the apparatus (5.1). Add water and, if necessary, some of the hydrochloric acid solution (4.1) so as to give a final volume not exceeding 40 ml. The resulting solution should have an acidity of between 2,5 N and 3 N.

6.2.2 If the test portion (6.1) contains more than 20 µg of As, dilute it with water, transfer the solution obtained quantitatively to a one-mark volumetric flask of suitable capacity, dilute to the mark and mix. Take an aliquot portion of accurately known volume not exceeding 20 ml and containing not more than 20 µg of As, and introduce it into the conical flask (5.1.1) of the apparatus (5.1). Add the hydrochloric acid solution (4.1) and water, taking care not to exceed a volume of 40 ml. The resulting solution should have an acidity of between 2,5 N and 3 N.

6.4 Preparation of the calibration graph

See ISO 2590, sub-clause 6.3.

6.3 Blank test

See ISO 2590, sub-clause 6.2.

6.5 Determination

To the test solution (6.2.1 or 6.2.2), contained in the conical flask (5.1.1), add 2 ml of the potassium iodide solution (4.6) and 2 ml of the tin(II) chloride solution (4.7); swirl and allow to stand for 15 min. Continue in accordance with the procedure specified in ISO 2590, sub-clause 6.3.1, starting from the third paragraph ("Place a little of the absorbent cotton wool . . .").

6.5.1 *Photometric measurements*

Carry out the photometric measurements on the test solution and the blank test solution according to the procedure specified in ISO 2590, sub-clause 6.4.1, after having, however, adjusted the instrument to zero absorbance against the silver diethyldithiocarbamate solution (4.2).

7 EXPRESSION OF RESULTS

By means of the calibration graph (see ISO 2590, subclause 6.3.3), determine the masses of arsenic corresponding to the value of the photometric measurement of the test solution and to that of the blank test solution.

The arsenic content, expressed in milligrams of arsenic (As) per kilogram, is given by the formula

$$\frac{m_1 - m_2}{m_0} \times D$$

where

m_0 is the mass, in grams, of the test portion (6.1);

m_1 is the mass, in micrograms, of As found in the test solution;

m_2 is the mass, in micrograms, of As found in the blank test solution;

D is the ratio of the volume of the test solution to the volume of the aliquot taken for the determination. (If the determination has been carried out on the whole of the test solution, D is equal to 1.)

8 TEST REPORT

The test report shall include the following particulars :

a) an identification of the sample;

b) the reference of the method used;

c) the results and the method of expression used;

d) any unusual features note during the determination;

e) 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 HYDROCHLORIC ACID FOR INDUSTRIAL USE

ISO 904 — Determination of total acidity — Titrimetric method.

ISO 905 — Evaluation of hydrochloric acid concentration by measurement of density.

ISO 906 — Determination of sulphate content — Barium sulphate gravimetric method.

ISO 907 — Determination of sulphated ash — Gravimetric method.

ISO 908 — Determination of oxidizing or reducing substances — Titrimetric method.

ISO/R 909 — Determination of iron content — 2,2′-Bipyridyl spectrophotometric method.

ISO 2762 — Determination of soluble sulphates — Turbidimetric method.

ISO 5785 — Determination of arsenic content — Silver diethyldithiocarbamate photometric method.