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

Ammonium hydrogencarbonate for industrial use (including foodstuffs) — Determination of arsenic content — Silver diethyldithiocarbamate photometric method

ERRATUM

Page 1

Sub-clause 6.1, note, 5th line : Replace "at the most" by "not more than",
12th line : Add "the" after "to".

Page 2

Annex : Delete "content" from the title of ISO 3420.

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INTERNATIONAL STANDARD 4275

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

Ammonium hydrogencarbonate for industrial use (including foodstuffs) — Determination of arsenic content — Silver diethyldithiocarbamate photometric method

Bicarbonate d'ammonium à usage industriel (y compris les industries alimentaires) — Dosage de l'arsenic — Méthode photométrique au diéthyldithiocarbamate d'argent

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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.

International Standard ISO 4275 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in October 1975.

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

Austria	Israel	South Africa, Rep. of
Belgium	Italy	Switzerland
Bulgaria	Korea, Rep. of	Thailand
Czechoslovakia	Mexico	Turkey
France	Poland	United Kingdom
Germany	Portugal	
Hungary	Romania	

The member body of the following country expressed disapproval of the document on technical grounds :

Netherlands

Printed in Switzerland

Ammonium hydrogencarbonate for industrial use (including foodstuffs) — 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 ammonium hydrogencarbonate for industrial use (including foodstuffs).

The method is applicable to products having arsenic contents, expressed as As, greater than 0,2 mg/kg.

2 REFERENCE

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

3 PRINCIPLE

Reduction of the arsenic to arsine by zinc in a sulphuric acid medium.

Absorption of the arsine in a solution of silver diethyldithiocarbamate in pyridine. Photometric measurement of the purplish-red colour produced by the colloidally dispersed silver, at the maximum of the absorption curve (wavelength approximately 540 nm).

4 REAGENTS

See clause 4 of ISO 2590. Replace "**4.1 Hydrochloric acid** . . . approximately 12 N." by :

4.1 Sulphuric acid, approximately 15 N solution.

Add :

4.9 Litmus paper.

5 APPARATUS

See ISO 2590, clause 5.

6 PROCEDURE

WARNING — See ISO 2590, clause 6.

6.1 Test portion and preparation of the test solution

Weigh, to the nearest 0,001 g, a mass of the test sample not exceeding 5 g, containing 1 to 20 μg of As.

Place the test portion in a 100 ml beaker and add 10 ml of water.

NOTE — If the mass of arsenic in the test portion is found to be greater than 20 μg, dissolve the test portion in a little water, transfer the solution quantitatively to a one-mark volumetric flask of suitable capacity, dilute to the mark and mix. Transfer an aliquot portion not exceeding 20 ml and containing at the most 20 μg of As to a 100 ml beaker.

Add the sulphuric acid solution (4.1) until the test solution is neutral to litmus paper (4.9), and add a further 10 ml of the sulphuric acid solution. Heat on a boiling water bath until carbon dioxide is completely expelled.

Cool and transfer the solution quantitatively to the conical flask (5.1.1), washing with water until a volume of about 40 ml is obtained.

6.2 Blank test

See ISO 2590, sub-clause 6.2.

6.3 Preparation of the calibration graph

See ISO 2590, sub-clause 6.3.

6.4 Determination

Add 2 ml of the potassium iodide solution (4.6) and 2 ml of the tin(II) chloride solution (4.7) to the test solution (6.1) or to the aliquot portion taken for the determination, placed in the conical flask (5.1.1), swirl and allow to stand for 15 min. Carry out the determination by the procedure specified in 6.3.1 of ISO 2590, commencing at the fourth paragraph ("Place a little of the absorbent cotton wool . . .").

6.4.1 *Photometric measurements*

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

7 EXPRESSION OF RESULTS

By means of the calibration graph (see 6.3.3 of ISO 2590), determine the masses of arsenic (As) corresponding to the values of the photometric measurement made on the test solution and the blank test solution.

The arsenic (As) content, expressed in milligrams 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 portion taken for the determination. (If the determination is carried out on the whole of the test solution, $D = 1$.)

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 AMMONIUM HYDROGENCARBONATE FOR INDUSTRIAL USE (INCLUDING FOODSTUFFS)

ISO 2515 – Determination of ammoniacal nitrogen content – Volumetric method after distillation.

ISO 2516 – Determination of total alkalinity – Volumetric method.

ISO 3420 – Determination of ash content – Gravimetric method.

ISO 3421 – Determination of lead content – Dithizone photometric method.

ISO 3422 – Determination of total carbon dioxide content – Titrimetric method.

ISO 4275 – Determination of arsenic content – Silver diethyldithiocarbamate photometric method.