International Standard 753/1

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Acetic acid for industrial use — Methods of test — Part 1 : General

Acide acétique à usage industriel — Méthodes d'essai — Partie 1 : Généralités

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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 753/1 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in March 1980.

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

Australia	France	Poland
Austria	Germany, F. R.	Romania
Belgium	Hungary	South Africa, Rep. of
Brazil	India	Switzerland
China	Italy	Thailand
Czechoslovakia	Korea, Rep. of	United Kingdom
Egypt, Arab Rep. of	Netherlands	USSR

No member body expressed disapproval of the document.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

International Standards ISO 753/1 to ISO 753/11 cancel and replace ISO Recommendation R 753-1968, of which they constitute a technical revision.

Printed in Switzerland

Acetic acid for industrial use — Methods of test — Part 1 : General

1 Scope and field of application

This part of ISO 753 gives general instructions relating to test methods for acetic acid for industrial use.

It also specifies the methods to be used for the determination of dry residue after evaporation on a water bath, for the determination of the crystallizing point (temperature) of glacial acetic acid, for the determination of water content, for the measurement of colour and for the determination of arsenic content.

The list of parts comprising ISO 753 is given in the annex.

2 References

ISO 759, *Volatile organic liquids for industrial use — Determination of dry residue after evaporation on a water bath (General method).*

ISO 760, *Determination of water — Karl Fischer method (General method).*

ISO 1392, *Determination of crystallizing point — General method.*

ISO 2211, *Liquid chemical products — Measurement of colour in Hazen units (platinum-cobalt scale).*

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

3 Sampling[1)]

Take the laboratory sample from material in the liquid state, melting it if necessary by storing it at a temperature not exceeding 30 °C and stirring it thoroughly before sampling. Place the sample in a clean, dry, airtight bottle fitted with a ground glass stopper or in a bottle fitted with a screw cap with an airtight polyethylene seal, of such a size that it is nearly completely filled by the sample. If it is necessary to seal the bottle, take care to avoid any contamination of the contents.

NOTE – A sample of not less than 500 ml is necessary for performing all the tests specified for the product.

4 Determination of dry residue after evaporation on a water bath

Use the method specified in ISO 759.

5 Determination of crystallizing point

Use the method specified in ISO 1392, subject to the following modifications appropriate for acetic acid.

5.1 Field of application

The method is applicable to products having acetic acid contents in the range 98 to 100 % (*m/m*).

5.2 Thermometer (see ISO 1392, sub-clause 4.4)

Use a thermometer of the mercury-in-glass type, graduated for use at 100 mm immersion, certified for accuracy, and complying with the requirements of the table.

6 Determination of water content

Use one of the methods specified in ISO 760.

Table

Thermometer range	Graduations	Length		Diameter of stem	Distance from bottom of bulb to main scale	Certificate to show necessary corrections to readings
		Main scale	Bulb			
°C	°C	mm	mm	mm	mm	°C
−0,5 to about 40,5	0,1	not less than 280	10 to 15	5,5 to 7,0	not less than 30	to within ± 0,05

1) The sampling of liquid chemical products for industrial use will form the subject of a future International Standard.

7 Measurement of colour

Use the method specified in ISO 2211.

8 Determination of arsenic content

Use the method specified in ISO 2590, subject to the following modifications appropriate for acetic acid.

8.1 Reagents

Use the reagents specified in clause 4 of ISO 2590, together with the following :

4.9 Hydrogen peroxide, approximately 100 g/l solution.

4.10 Sulphuric acid, ϱ 1,84 g/ml, about 96 % (m/m) solution.

4.11 Sulphuric acid, approximately 200 g/l solution.

8.2 Test portion and preparation of test solution (see ISO 2590, sub-clause 6.1)

Weigh, to the nearest 0,001 g, a quantity of the laboratory sample containing 1 to 20 µg of arsenic (generally about 50 g). Place the test portion in a beaker containing 50 ml of water. Add 5 ml of the 100 g/l hydrogen peroxide solution (4.9), and evaporate almost to dryness on a sand bath. Carefully add 5 ml of the sulphuric acid solution (4.10) and evaporate, in a well-ventilated fume cupboard, until white fumes are evolved. Dissolve the residue in a little water (approximately 5 ml) and transfer the solution quantitatively to the conical flask (5.1.1) of the apparatus for the liberation and total absorption of the arsine (see ISO 2590, sub-clause 5.1), using the sulphuric acid solution (4.11). Make up to about 40 ml with the same sulphuric acid solution.

8.3 Expression of results (see ISO 2590, clause 7)

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

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

where

m_0 is the mass, in grams, of the test portion;

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.

9 Test report

The test report for each determination shall contain 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 noted during the determination;

e) any operation not included in the appropriate part of ISO 753 or in the other International Standards to which reference is made, or regarded as optional.

Annex

ISO publications relating to acetic acid for industrial use

ISO 753/1 — General.

ISO 753/2 — Determination of acetic acid content — Titrimetric method.

ISO 753/3 — Determination of low formic acid contents — Gravimetric method.

ISO 753/4 — Determination of acetaldehyde monomer content — Titrimetric method.

ISO 753/5 — Determination of total acetaldehyde content — Titrimetric method.

ISO 753/6 — Determination of permanganate index.

ISO 753/7 — Determination of dichromate index.

ISO 753/8 — Visual limit test for inorganic chlorides.

ISO 753/9 — Visual limit test for inorganic sulphates.

ISO 753/10 — Visual limit test for heavy metals (including iron).

ISO 753/11 — Determination of iron content — 1,10-Phenanthroline photometric method.