
INTERNATIONAL STANDARD



1061

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

Plastics — Unplasticized cellulose acetate — Determination of free acidity

Matières plastiques — Acétate de cellulose non plastifié — Détermination de l'acidité libre

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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.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 61 has reviewed ISO Recommendation R 1061 and found it technically suitable for transformation. International Standard ISO 1061 therefore replaces ISO Recommendation R 1061-1969 to which it is technically identical.

ISO Recommendation R 1061 was approved by the Member Bodies of the following countries :

Australia	India	South Africa, Rep. of
Austria	Iran	Spain
Belgium	Israel	Sweden
Bulgaria	Italy	Switzerland
Canada	Japan	Turkey
Czechoslovakia	Korea, Dem. P. Rep. of	United Kingdom
Egypt, Arab Rep. of	Korea, Rep. of	U.S.A.
France	Netherlands	U.S.S.R.
Germany	New Zealand	Yugoslavia
Greece	Poland	
Hungary	Romania	

No Member Body expressed disapproval of the Recommendation.

The Member Body of the following country disapproved the transformation of ISO/R 1061 into an International Standard :

Canada

Plastics – Unplasticized cellulose acetate – Determination of free acidity

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the amount of free acidity in unplasticized cellulose acetate.

The free acidity determined by this method includes acidity extractable by water, and acidity due to carboxyl groups attached to the cellulose acetate. The latter is usually a very small proportion of the total.

This method is not suitable for cellulose acetate containing any additive which may affect the test.

2 REFERENCE

ISO/R 585, *Plastics – Determination of the moisture content of non-plasticized cellulose acetate.*

3 PRINCIPLE

Treatment of the cellulose acetate with water, and subsequent titration with sodium hydroxide solution.

Calculation of the free acidity and expression as the percentage, by mass, of free acetic acid in cellulose acetate.

4 REAGENTS

4.1 Sodium hydroxide, 0,01 N standard volumetric solution.

4.2 Phenolphthalein, 1 g/l solution in 90 % (V/V) ethanol.

4.3 Distilled water, freshly boiled to remove carbon dioxide, and cooled.

5 APPARATUS

5.1 Glass flask, 250 or 300 ml, with ground glass stopper.

5.2 Cylinder, 250 ml, graduated in 2 ml.

5.3 Burette, 25 ml, graduated in 0,05 ml, protected against carbon dioxide by a soda lime tube.

5.4 Analytical balance, accurate to 0,01 g.

6 TEST SAMPLE

6.1 The sample of cellulose acetate must be in granules of dimensions not exceeding 0,07 cm. It should be ground if necessary.

6.2 Determine the moisture content of the sample according to ISO/R 585.

7 PROCEDURE

7.1 Weigh in the flask 10 g or more, depending on the free acidity of the sample of cellulose acetate, to the nearest 0,01 g.

7.2 Add 150 ml of distilled water (4.3), measured with a 250 ml graduated cylinder.

7.3 Condition the stoppered flask at a temperature between 20 and 27 °C either for 3 h with gentle shaking for 5 min every 30 min, or with continuous shaking for 1 h.

7.4 Titrate with the sodium hydroxide solution (4.1), using phenolphthalein (4.2) as indicator.

NOTE – Titration should be rapid to avoid saponification of the cellulose acetate and absorption of carbon dioxide from the atmosphere.

7.5 Perform a blank test, introducing into the flask 150 ml of distilled water. Allow to stand for 3 h or shake for 1 h in the same way as for the sample at a temperature between 20 and 27 °C. Titrate quickly with the sodium hydroxide solution (4.1), using phenolphthalein (4.2) as indicator.

7.6 Carry out two complete determinations. If the difference between the determinations is greater than 10 % of the mean, the test should be repeated.

8 EXPRESSION OF RESULTS

8.1 The free acidity, expressed as grams of acetic acid per 100 g of dry cellulose acetate, is calculated from the formula

$$\frac{(V_1 - V_2) \times 0,06}{m}$$

where

V_1 is the volume, in millilitres, of sodium hydroxide 0,01 N standard volumetric solution required to titrate the sample solution;

V_2 is the volume, in millilitres, of sodium hydroxide 0,01 N standard volumetric solution required to titrate the blank;

m is the mass, in grams, of dry cellulose acetate used in the test, calculated from the actual mass of the sample and its moisture content as determined according to 6.2.

8.2 Report the mean of the two determinations.

9 TEST REPORT

The test report shall include the following particulars :

- a) complete identification of the product tested including type, manufacturer's code number, source, trade name, etc.;
- b) treatment of the sample before the test, if any;
- c) free acidity;
- d) method of test;
- e) test date.

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