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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1061

PLASTICS

DETERMINATION OF FREE ACIDITY OF UNPLASTICIZED CELLULOSE ACETATE

1st EDITION
April 1969

For each individual country the only valid standard is the national standard of that country.

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BRIEF HISTORY

The ISO Recommendation R 1061, *Plastics – Determination of free acidity of unplasticized cellulose acetate,* was drawn up by Technical Committee ISO/TC 61, *Plastics,* the Secretariat of which is held by the United States of America Standards Institute (USASI).

Work on this question led to the adoption of a Draft ISO Recommendation.

In May 1967, this Draft ISO Recommendation (No. 1273) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

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

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in April 1969, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 1061 April 1969

PLASTICS

DETERMINATION OF FREE ACIDITY OF UNPLASTICIZED CELLULOSE ACETATE

1. SCOPE

This ISO Recommendation describes 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.

2. FIELD OF APPLICATION

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

3. PRINCIPLE OF METHOD

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

3.2 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 The moisture content of the sample should be determined according to ISO Recommendation R 585, *Determination of the moisture content of non-plasticized cellulose acetate.*

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 hours with gentle shaking for 5 minutes every 30 minutes, or with continuous shaking for 1 hour.

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 hours or shake for 1 hour 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.