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Wool — Determination of acid content

Laine — Détermination de l'acidité

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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 3073 was drawn up by Technical Committee ISO/TC 38, *Textiles,* and circulated to the Member Bodies in October 1974.

It has been approved by the Member Bodies of the following countries :

Australia	Hungary	South Africa, Rep. of
Belgium	India	Spain
Bulgaria	Iran	Sweden
Canada	Ireland	Turkey
Chile	Israel	United Kingdom
Czechoslovakia	Japan	U.S.A.
Denmark	Netherlands	U.S.S.R.
Finland	New Zealand	Yugoslavia
France	Poland	
Germany	Romania	

No Member Body expressed disapproval of the document.

This International Standard is based on Test Method IWTO-3-65, drawn up by the International Wool Textile Organization (IWTO).

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Wool — Determination of acid content

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for determining the acid content of a wool sample, expressed as a percentage by mass.

This method is applicable to undyed wool in any form, for example loose fibre, sliver, yarn or fabric. It is also applicable to dyed wool when the amount of dye extracted during the test does not interfere with the determination of the end-point of the titration.

2 PRINCIPLE

Immersion of a known amount of the wool in a dilute solution of pyridine which extracts the acid from the wool. Determination of the amount of acid extracted, by titration with standard sodium hydroxide solution.

3 REFERENCE

ISO 1130, *Textile fibres — Some methods of sampling for testing.*

4 REAGENTS

4.1 Pyridine, 5 g/l solution.

Dissolve 5 g of pyridine (analytical grade) in 1 l of distilled water.

4.2 Sodium hydroxide, 0,1 N solution.

Standardize this solution by titration with standard potassium hydrogen phthalate solution.

4.3 Phenolphthalein, 5 g/l ethanolic solution.

Dissolve 0,5 g of phenolphthalein in 95 % (*V/V*) ethanol and dilute to 100 ml with the same ethanol.

5 APPARATUS

5.1 Glass-stoppered conical flasks, 250 ml capacity.

5.2 Conical flasks, 250 ml capacity.

5.3 Pipettes, 50 and 100 ml capacity.

5.4 Burette, 25 ml capacity.

5.5 Stoppered weighing bottle.

5.6 Analytical balance, accurate to 0,000 5 g.

5.7 Desiccator.

5.8 Ventilated oven for drying samples at 105 ± 3 °C.

5.9 Mechanical shaker (optional).

5.10 Glass beakers, 250 ml capacity.

5.11 Glass wool.

6 SAMPLING

Take a sample representative of the bulk and of mass not less than 10 g[1]. It is assumed that the sample is commercially free from oil and fatty matter.

Useful information on sampling is given in ISO 1130.

7 PROCEDURE

7.1 Take at least two test specimens representative of the sample, each of mass 2 ± 0,001 g, and one specimen of mass 1 ± 0,001 g.

7.2 Place the 1 g test specimen in a weighing bottle (5.5) and dry in the ventilated oven (5.8) at 105 ± 3 °C. Stopper the bottle, cool in the desiccator (5.7) and determine the mass of the bottle and contents. Continue heating until constant mass[2] has been attained. Remove the contents of the bottle and determine the dry mass of the specimen by determining the mass of the empty bottle.

NOTE — Ensure that each specimen is treated in such a way that all have the same moisture content.

1) This quantity is taken to provide for a second test if necessary.

2) Constant mass may be deemed to have been attained when the change in mass of a specimen which has been re-dried for at least 30 min does not exceed 0,001 g.

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7.3 Place the other two test specimens in separate glass-stoppered conical flasks (5.1) and add 100 ml of pyridine solution (4.1) to each. Stopper each flask and shake on the mechanical shaker (5.9) for 1 h. Alternatively, allow each flask to stand overnight after initial shaking to ensure wetting of the specimen.

Decant the liquid from each flask into separate glass beakers (5.10), filtering through plugs of glass wool (5.11) to retain fibrous material. From each beaker, pipette 50 ml of the filtered liquid into separate conical flasks (5.2), add 3 drops of phenolphthalein solution (4.3) to each flask and titrate each extract with the sodium hydroxide solution (4.2) until a faint pink colour persists after a gentle shaking by hand.

A potentiometric end-point determination is allowed.

8 EXPRESSION OF RESULTS

The mass of acid, A, expressed as a percentage of the dry mass of the test specimen, is given by the formula :

$$A = \frac{T \times V \times k}{m}$$

where

T is the normality of the sodium hydroxide solution used for the titration;

V is the volume, in millilitres, of sodium hydroxide solution used for the titration;

k is a constant which has the following values :
for calculating as hydrochloric acid : 3,65
for calculating as formic acid : 4,6
for calculating as sulphuric acid : 4,9
for calculating as acetic acid : 6,0

m is the dry mass, in grams, of the test specimen of mass approximately 1 g.

9 TEST REPORT

The test report shall include the following information :

a) the reference to this International Standard;

b) the mean of the results obtained;

c) the type of acid for which the calculation has been made;

d) the mass of the acid for each of the two 2 g test specimens used and also the mean of the results obtained.

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