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IULTCS/IUC 11

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Leather — Chemical tests — Determination of pH

Cuir — Essais chimiques — Détermination du pH

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4045/IUC 11 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, in collaboration with the Chemical Tests Commission of the International Union of Leather Technologists and Chemists Societies (IUC Commission, IULTCS), in accordance with the Agreement on technical co-operation between ISO and CEN (Vienna Agreement). It is based on IUC 11 originally published in *J. Soc. Leather Trades Chemists*, **49**, pp. 25-29, 1965, and declared an official method of the IULTCS in 1965.

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IULTCS, originally formed in 1897, is a world-wide organization of professional leather societies to further the advancement of leather science and technology. IULTCS has three Commissions, which are responsible for establishing international methods for sampling and the testing of leather. ISO recognizes IULTCS as an international standardizing body for the preparation of test methods for leather.

This second edition cancels and replaces the first edition (ISO 4045:1977), which has been technically revised.

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Leather — Chemical tests — Determination of pH

1 Scope

This International Standard specifies a method for determining the pH value and the difference figure of an aqueous leather extract. It is applicable to all types of leather.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2418, *Leather — Chemical, physical and mechanical and fastness tests — Sampling location*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 4044, *Leather — Chemical tests — Preparation of chemical test samples*

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3 Terms and definitions

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For the purpose of this document, the following terms and definitions apply.

3.1
difference figure
difference between the pH value of a solution and that of its ten-fold dilution

NOTE The difference figure is a measure of the strength of acids and bases and can never exceed a value of 1. The difference figure amounts to 0,7 to 1,0 when a solution contains a free strong acid (or a free strong base). The ionization of weak acids and bases increases with greater dilution, and therefore the difference figure can only act as a criterion for the presence of free strong acid or base in aqueous extracts with pH values below 4 or above 10.

4 Principle

Preparation of an aqueous extract from a test portion of the leather and measurement of the pH of the extract, using a pH meter. In cases where the pH value obtained is below 4,00 or above 10,00, the pH value of a ten-fold dilution of the aqueous extract is also determined.

5 Reagents

5.1 **Water**, Grade 3 in accordance with ISO 3696. The water shall be kept in a freshly boiled-out container of resistant glass of low alkali content.

5.2 **Buffer solution**, for calibrating the electrode system.

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It is preferable to purchase a commercially available standard buffer solution for measurement as recommended by the pH meter manufacturer. The length of time for which buffer solutions will keep depends on their composition and the method of use. Control of the accuracy of the buffer solution is therefore indispensable. Used buffer solution shall be discarded.

6 Apparatus

6.1 Suitable shaker, adjusted to a frequency of (50 ± 10) min^{-1}.

6.2 pH meter, with glass electrode, with a measuring range from 0 to 14 pH units, graduated in 0,05 pH units. The electrode system shall be calibrated prior to each series of measurements against the buffer solution (5.2).

Aqueous extracts of heavily fat-liquored leather may in time make the electrode membrane dirty. In such cases, the membrane shall be lightly rubbed with a piece of cotton wool dipped in acetone or the electrode should be suspended in a 1:1 water:acetone mixture. After cleaning, the membrane should again be thoroughly soaked in water.

6.3 Analytical balance, capable of weighing to an accuracy of 0,1 mg.

6.4 Wide mouthed flask, with leak-proof stopper, capacity 250 ml.

6.5 Measuring cylinder, capacity 100 ml, graduated in 1 ml divisions.

6.6 Volumetric flask, capacity 100 ml.

6.7 Pipette, capacity 10 ml.

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7 Sampling and preparation of the samples

If possible, sample in accordance with ISO 2418. If sampling in accordance with ISO 2418 is not possible, then details about sampling shall be given in the test report. Grind the leather in accordance with ISO 4044.

Two separate samples shall be analysed.

8 Procedure

8.1 Preparation of the extract

Weigh (5 ± 0,1) g of the test sample into the wide mouthed flask (6.4) and add (100 ± 1) ml of water (5.1) at (20 ± 2) °C. Shake well by hand for about 30 s so that the test portion is uniformly wet. Shake mechanically in the shaker (6.1) for between 6 h and 6,5 h. Allow the extract to settle before decanting. If difficulty is experienced in decanting the extract from the slurry, it may be strained through a clean, dry, non-absorbent mesh (for example, nylon cloth or a coarse sintered glass filter), or centrifuged.

8.2 Determination of the pH value

Standardize the pH meter with two buffer solutions; one below the expected value and one above the expected value. Both these buffer readings shall be within 0,02 pH unit of the correct reading when the meter is standardised.

Ensure that the extract (8.1) is at (20 ± 2) °C. Immediately after stirring the extract solution, determine the pH value with the pH meter (6.2), to the nearest 0,05 pH unit, as soon as a steady reading has been reached. The reading shall be taken within 30 s to 60 s after rinsing the electrodes in the extract.

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8.3 Determination of the difference figure

If the pH value is below 4 or over 10, the difference figure shall be determined. For this determination, transfer, using the pipette (6.7), 10 ml of the extract into the volumetric flask (6.6) and make up to the mark with water. Rinse the electrodes with approximately 20 ml of the diluted solution and then measure the pH value as in 8.2.

8.4 Calculation of the difference figure

The difference figure is calculated by subtracting the pH value obtained in 8.3 from that obtained in 8.2. The result is quoted to the nearest 0,05 pH unit.

9 Test report

The test report shall include the following:

a) reference to this International Standard (ISO 4045);

b) details of any deviations from the prescribed test conditions;

c) reference to any instability of the pH reading of the extract which prevents an unequivocal statement of the pH value or difference figure;

d) a statement of the mean value of the individual determinations of pH value and, if this is below 4 or above 10, the difference figure. The figures shall be given to the nearest 0,05 pH unit.

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