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Leather — Chemical tests — Determination of chromium (VI) and the reductive potential for chromium tanning agents

Cuir — Essais chimiques — Détermination de la teneur en chrome (VI) et du potentiel de réduction des agents de tannage au chrome

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

ISO 19071 was prepared by the Chemical Testing Commission of the International Union of Leather Technologists and Chemists Societies (IUC Commission, IULTCS) in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, the secretariat of which is held by UNI, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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 the sampling and testing of leather. ISO recognizes IULTCS as an international standardizing body for the preparation of test methods for leather.

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Introduction

Under REACH regulations, manufacturers of chemicals are required to register their products before placing them on the market. Accordingly, a new method is given for the determination of chromium (VI) in chromium tanning agents.

Chromium tanning agents consist of chromium sulfate, containing additional hydroxyl groups in different amounts. These tanning agents exhibit a reductive potential. In the presence of reducing agents the recovery rate of chromium (VI) can be significantly lower than 90 %.

Consequently another procedure has to be selected to determine the exact chromium (VI) content. This is based on the standard addition procedure, and was developed in consultation with TEGEWA working group “Leather Auxiliaries” (TEGEWA is the Association of German Manufacturers of Textile, Leather and Washing Agent chemical products).

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Leather — Chemical tests — Determination of chromium (VI) and the reductive potential for chromium tanning agents

1 Scope

This International Standard specifies a test method for the determination of chromium (VI) content in chromium tanning agents. The results give information about the reductive potential of the chromium tanning agent.

2 Normative references

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

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

3 Principle

The chromium tanning agent is dissolved in water. After reaction of chromium (VI) with 1,5-diphenylcarbazide the resulting complex is extracted using *n*-hexanol. The concentration of the complex in the extract is determined by photometry at 540 nm.

Due to the presence of reducing agents in commercial chromium tanning agents, it is necessary to use the method of standard addition to determine the reductive potential. The procedure is repeated by adding different amounts of chromium (VI) to the original solution of the chromium tanning agent.

4 Reagents

All reagents used shall have at least analytical grade purity.

4.1 Deionised water, freshly prepared according to ISO 3696, grade 3.

4.2 Phosphoric acid solution, 700 ml *o*-phosphoric acid (ρ = 1,71 g/ml[1)]) made up to 1 000 ml with water (4.1).

4.3 Chromium (VI) stock solution [1 mg Cr(VI)/ml]. Potassium dichromate, ($K_2Cr_2O_7$), is dried (16 ± 2) h at (102 ± 2) °C. Dissolve 2,829 g of the dried potassium dichromate in water into a 1 000 ml volumetric flask and make up to the mark with water (4.1).

4.4 Chromium (VI) standard solution I [10 µg Cr(VI)/ml]. Pipette 10 ml of the chromium (VI) stock solution into a 1 000 ml volumetric flask and make up to the mark with water (4.1).

4.5 Glacial acetic acid.

1) ρ = mass concentration

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