INTERNATIONAL STANDARD 2915

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

Wool — Determination of cysteic acid content of wool hydrolysates by paper electrophoresis and colorimetry

Laine — Détermination de la teneur en acide cystéique dans les hydrolysats de laine par électrophorèse sur papier et colorimétrie

First edition — 1975-05-01

UDC 677.31 : 677.01 **Ref. No. ISO 2915-1975 (E)**

Descriptors : textile, wool, chemical analysis, determination of content, cysteic acids, electrophoresis analysis, colorimetric analysis.

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 2915 was drawn up by Technical Committee ISO/TC 38, *Textiles,* and circulated to the Member Bodies in December 1972.

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

Australia	Hungary	Romania
Belgium	India	South Africa, Rep. of
Bulgaria	Iran	Spain
Canada	Israel	Sweden
Czechoslovakia	Japan	Switzerland
Denmark	Netherlands	Thailand
Egypt, Arab Rep. of	New Zealand	Turkey
Finland	Norway	United Kingdom
France	Poland	U.S.S.R.
Germany	Portugal	

No Member Body expressed disapproval of the document.

Printed in Switzerland

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0 INTRODUCTION

This International Standard is based on the IWTO test method 23-70, drawn up by the International Wool Textile Organization.

Cysteic acid is one of the oxidation products of the amino acids cystine and cysteine. The cysteic acid content of raw wool is normally very low; it increases with photochemical degradation (weathering). Finishing processes such as bleaching or chlorination always result in an increase in cysteic acid.

The severity of any kind of oxidation may be determined directly by quantitative determination of cysteic acid. In certain instances it may be useful to make comparative tests on corresponding samples of untreated material, or material not subject to complaint.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the cysteic acid content of wool hydrolysates using paper electrophoresis and colorimetry.

The method is applicable to all-wool textiles in any form before or after dyeing — for example, loose wool, sliver, slubbing, yarn or fabric. When testing blends, the proportion of wool must be known exactly. The method is also applicable to wool after carbonizing.

2 PRINCIPLE

Hydrolysis of the wool, followed by separation of the cysteic acid present in the resultant hydrolysate from the other amino acids by paper electrophoresis. Staining of the paper strip and elution of the zone containing the cysteic acid. Colorimetric determination of the cysteic acid content by comparison with a known amount of cysteic acid applied to the paper strip at the same time.

3 REAGENTS

During the analysis, use only reagents of analytical reagent grade and only distilled water or water of equivalent purity.

3.1 Methanol.

3.2 Hydrochloric acid, 5,7 N solution made from concentrated hydrochloric acid, ρ 1,19 g/ml, azeotropically distilled.

3.3 Ninhydrin-cadmium reagent.

Dissolve 100 mg of cadmium acetate in 10 ml of water, and add consecutively 5 ml of glacial acetic acid, 100 ml of acetone and 1 g of ninhydrin. The reagent may be kept for one week in a brown bottle in a refrigerator. Each portion of reagent used for staining shall be used once only.

3.4 Buffer solution, pH 3,5.

Dissolve 10 ml of pyridine and 100 ml of glacial acetic acid in 890 ml of distilled water. The buffer solution must be renewed after five separations.

3.5 Cysteic acid standard solution.

Dissolve 110,6 mg of cysteic acid monohydrate (corresponding to 100 mg of anhydrous cysteic acid) in distilled water in a 100 ml measuring flask. Before weighing, dry the cysteic acid for 24 h at approximately 70 °C in a drying pistol over phosphorus pentoxide.

3.6 Barium chloride solution.

Dissolve 2,5 g of barium chloride dihydrate ($BaCl_2.2H_2O$) in distilled water in a 100 ml measuring flask.

4 APPARATUS

4.1 Weighing bottles.

4.2 Analytical balance, accurate to 0,000 2 g.

4.3 Ventilated drying oven for drying and hydrolysing the test specimens at 105 ± 2 °C and for drying the paper strips at 70 °C.

4.4 Desiccator.

4.5 Thick-walled glass tube, diameter approximately 2 cm, length 30 cm.

4.6 Forceps and **glass rod.**

4.7 Blow-pipe.