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**Textiles — Quantitative chemical  
analysis —**

**Part 4:  
Mixtures of certain protein fibres with  
certain other fibres (method using  
hypochlorite)**

*Textiles — Analyse chimique quantitative —*

*Partie 4: Mélanges de certaines fibres protéiniques avec certaines  
autres fibres (méthode à l'hypochlorite)*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 38, *Textiles* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 1833-4:2017), which has been technically revised.

The main changes are as follows:

- in [5.1.2](#), the instruction for the preparation of the sodium hypochlorite solution has been detailed.

A list of all parts in the ISO 1833 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Textiles — Quantitative chemical analysis —

## Part 4:

# Mixtures of certain protein fibres with certain other fibres (method using hypochlorite)

## 1 Scope

This document specifies a method, using hypochlorite, to determine the mass percentage of protein fibre, after removal of non-fibrous matter, in textiles made of mixtures of certain non-protein fibres and certain protein fibres, as follows:

— wool, other animal-hair (such as cashmere, mohair), silk, protein,

with

— cotton, cupro, viscose, modal, acrylic, chlorofibres, polyamide, polyester, polypropylene, glass, elastane, elastomultiester, elastolefin, melamine and polypropylene/polyamide bicomponent.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1833-1, *Textiles — Quantitative chemical analysis — Part 1: General principles of testing*

## 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

## 4 Principle

The protein fibre is dissolved out from a known dry mass of the mixture with alkaline hypochlorite. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of protein fibre is found by the difference.

## 5 Reagents

Use the reagents described in ISO 1833-1 together with those given in [5.1](#), [5.2](#) and [5.3](#).

## 5.1 Hypochlorite solution.

### 5.1.1 Preparation of hypochlorite solution

Either sodium hypochlorite (5.1.2) or lithium hypochlorite (5.1.3) can be used for the preparation of the hypochlorite solution. Lithium hypochlorite (5.1.3) should be used in cases involving a small number of analyses or for analyses conducted at fairly lengthy intervals. This is because the percentage of hypochlorite in solid lithium hypochlorite, unlike that in sodium hypochlorite, is virtually constant. If the percentage of hypochlorite is known, hypochlorite content does not need to be checked iodometrically for each analysis, since a constant weighed portion of lithium hypochlorite can be employed.

### 5.1.2 Sodium hypochlorite.

Sodium hypochlorite solution containing  $(35 \pm 2)$  g/l of active chlorine (approximately 1 mol/l) to which  $(5,0 \pm 0,5)$  g/l of previously dissolved sodium hydroxide is added.

It is important to get a hypochlorite solution with the required active chlorine content, and with sodium hypochlorite, this has to be checked regularly.

Prior to use, the active chlorine content of the solution shall be checked iodometrically, however, its concentration is not critical within the range 0,9 mol/l to 1,1 mol/l.

Calculate the dilution necessary to convert it to an active chlorine content of 3,5 %, and therefore the volume of concentrated hypochlorite solution needed to produce 1 l of the required reagent. To this amount of the concentrated solution, add the whole of a solution containing  $(5,0 \pm 0,5)$  g of sodium hydroxide (5.2) in 200 ml of water and dilute to 1 l with water. Mix well. Prepare freshly each day.

### 5.1.3 Lithium hypochlorite.

Dissolve 100 g of lithium hypochlorite containing 35 % active chlorine (or 115 g containing 30 % active chlorine) in approximately 700 ml of water, add 5 g of sodium hydroxide (5.2) dissolved in approximately 200 ml of water and make up to 1 l with water.

The solution which has been freshly prepared does not need to be checked iodometrically.

## 5.2 Sodium hydroxide.

## 5.3 Acetic acid, dilute solution.

Dilute 5 ml of acetic acid ( $\rho = 1,05$  g/ml at 20 °C) to 1 l with water.

## 6 Apparatus

Use the apparatus described in ISO 1833-1 together with those given in 6.1 and 6.2.

### 6.1 Conical flask, minimum capacity 250 ml.

### 6.2 Water-bath, at temperature $(20 \pm 2)$ °C.

## 7 Test procedure

Follow the general procedure described in ISO 1833-1, and then proceed as follows.

To the test specimen contained in the conical flask, add 100 ml of hypochlorite solution per gram of test specimen, agitate vigorously to wet out the test specimen and agitate continuously for 40 min in a water bath at  $(20 \pm 2)$  °C.

Pay attention to keep the water bath temperature within the limits as the dissolution of some fibres (e.g. wool) proceeds exothermically. This can be done by distributing and removing the reaction heat; otherwise, considerable errors can be caused by the incipient dissolution of the non-soluble fibres.

Filter the contents of the flask through the weighed filter crucible and transfer any residual fibres to the crucible by washing out the flask with a little hypochlorite solution.

Drain the crucible using suction and wash the residue successively with water, dilute acetic acid, and finally water, draining the crucible using suction after each addition. Do not apply suction until each washing liquid has drained under gravity.

Finally, drain the crucible using suction, dry the crucible and residue, then cool and weigh them.

## 8 Calculation and expression of results

Calculate the results as described in the general instructions of ISO 1833-1.

The value of  $d$  is 1,00, except for raw cotton for which  $d = 1,03$ , and for cotton, viscose, modal, melamine for which  $d = 1,01$ .

## 9 Precision

On a homogeneous mixture of textile materials, the confidence limits of the results obtained by this method are not greater than  $\pm 1$  percentage point for the confidence level of 95 %.

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