INTERNATIONAL STANDARD

ISO 16373-2

First edition
2014-06-01

Textiles — Dyestuffs —

Part 2: General method for the determination of extractable dyestuffs including allergenic and carcinogenic dyestuffs (method using pyridine-water)

Textiles — Colorants —

Partie 2: Méthode générale de détermination des colorants extractibles, notamment les colorants allergènes et cancérigènes (méthode utilisant un mélange pyridine/eau)

Reference number
ISO 16373-2:2014(E)

© ISO 2014



COPYRIGHT PROTECTED DOCUMENT

© ISO 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Principle ... **1**
5 Safety precautions ... **1**
6 Reagents ... **2**
7 Apparatus ... **2**
7.1 Apparatus and auxiliaries for sample preparation ... 2
7.2 Chromatographic equipment (selected from the following) ... 2
8 Procedure ... **3**
8.1 Preparation of test specimen ... 3
8.2 Extraction ... 3
8.3 Detection and quantification of dyestuff ... 3
8.4 Calibration ... 3
9 Calculation and expression of the results ... **4**
10 Test report ... **4**
Annex A (normative) **List of carcinogenic dyestuffs** ... **5**
Annex B (normative) **List of allergenic and other dyestuffs** ... **6**
Annex C (normative) **Calculation** ... **7**
Annex D (informative) **Examples of chromatographic methods** ... **8**
Annex E (informative) **Reliability of the method** ... **17**
Annex F (informative) **Multiple-extraction of several textile fibres with pyridine/water** ... **18**
Bibliography ... **20**

© ISO 2014 – All rights reserved

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 documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 16373-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products*, in collaboration with ISO Technical Committee TC 38, *Textiles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 16373 consists of the following parts, under the general title *Textiles — Dyestuffs*:

— *Part 1: General principles of testing coloured textiles for dyestuff identification*

— *Part 2: General method for the determination of extractable dyestuffs including allergenic and carcinogenic (method using pyridine-water)*

— *Part 3: Method for determination of carcinogenic extractable dyestuffs (method using triethylamine/methanol)*

 © ISO 2014 – All rights reserved

Introduction

The ISO 16373 series deals with dyestuffs used in textile for qualification and quantification.

ISO 16373-1[1)] includes the definition of the dyestuff classes and the description of some procedures to identify qualitatively the dyestuff class used in textile material.

The other parts of ISO 16373 are related to the quantification of some dyestuffs.

In this part of ISO 16373, the principle of the test method is based on the extraction using pyridine-water solution, which has been found to be the most efficient solution to extract a large range of dyestuffs, including allergenic and carcinogenic dyestuffs.

In ISO 16373-3, the principle of the test method is based on extraction using triethylamine/methanol solution. This solution has been found efficient to extract some dyestuffs in some cases.

Additional information related to the recovery rate (to characterize the extraction efficiency) obtained from the application of ISO 16373-3 and this part of ISO 16373 will be summarized in ISO 16373-1.

It is important to note that other test methods exist related to azo dyes, for which a reduction of those extracted azo dyes leads to the release of some aromatic amines, to be detected and determined using chromatography.

The percentage of recovery using the method of this part of ISO 16373 is shown in Annex F for the dyestuff classes (to be defined in ISO 16373-1) acid, basic, direct, disperse, solvent dyestuffs and "mordant dyestuffs" on different textile fibres.

1) To be published.

© ISO 2014 – All rights reserved

Textiles — Dyestuffs —

Part 2: General method for the determination of extractable dyestuffs including allergenic and carcinogenic dyestuffs (method using pyridine-water)

1 Scope

This part of ISO 16373 specifies the analyses used to detect extractable dyestuffs in textile products, with the extraction performed for all kind of fibres and types of dyestuffs using pyridine/water (1:1). It lists (see Annexes A and B) the allergenic and carcinogenic dyestuffs which can be analysed using this method; the lists of dyestuffs are expandable.

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 Terms and definitions

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

3.1
allergenic dyestuff
dyestuff which may cause an allergic skin reaction

3.2
carcinogenic dyestuff
dyestuff which is classified as carcinogenic substance

Note 1 to entry: Harmonized classification according to the *Globally harmonized system of classification and labelling of chemicals (GHS)*,[2] incorporated in EU Regulation 1272/2008 (CLP)[3].

4 Principle

A coloured test specimen is selected from the textile article and extracted with pyridine/water at 100 °C. The extract is analysed by liquid chromatography/diode array detection (LC/DAD) and/or by liquid chromatography/mass spectrometry (LC/MS).

5 Safety precautions

WARNING —The substances listed in Tables A.1, B.1 and B.2 are classified as substances known to be or suspected to be human allergens or carcinogens.

Ensure that any handling and disposal of these substances is in strict accordance with the appropriate national health and safety regulations.

© ISO 2014 – All rights reserved