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English version

**Durability of wood and wood-based products – Quantitative
determination of pentachlorophenol in wood – Gas
chromatographic method**

Durabilité du bois et des matériaux dérivés du bois –
Analyse quantitative du pentachlorophénol dans le bois –
Méthode par chromatographie en phase gazeuse

Dauerhaftigkeit von Holz und Holzprodukten – Quantitative
Bestimmung von Pentachlorphenol in Holz –
Gaschromatographische Verfahren

This Technical Report was approved by CEN on 27 July 2003. It has been drawn up by the Technical Committee CEN/TC 38.

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Foreword

This document (CEN/TR 14823:2003) has been prepared by Technical Committee CEN/TC 38 "Durability of wood and wood-based products", the secretariat of which is held by AFNOR.

This status of this document as Technical Report has been chosen because this method described is an example of a laboratory method validated by a ring test. It is recognized that, for example, different techniques of extraction might be employed by the analyst without loss of analytical performance and quality. However, when using different techniques the comparability to the method described in this Technical Report should be demonstrated, e.g. by using a certified reference material (CRM).

Introduction

At present, no standardised method for the analysis of pentachlorophenol (PCP) in wood is recognized in Europe. Only a few national standards are available world wide, e.g. BS 5666, Part 6 and AWP Standard A-5 and these methods are designed for the analysis of timber treated with levels of PCP that are necessary to prevent degradation of the treated timber by fungi.

This Technical Report has been issued in order to facilitate the analysis of PCP-treated wood and panels and in particular low levels of PCP that can be present in packaging timbers and pallets. Low levels of PCP and other chlorophenols, and the anisoles derived from them, can cause taints in foodstuffs. PCP can be present as residues from old anti-sapstain treatment or some timber treated against decay could inadvertently have been incorporated into the panel product.

1 Scope

This Technical Report specifies a laboratory method of determining the pentachlorophenol content of wood. The method is applicable to all types of PCP- treated wood and wood-based materials as well as for the analysis of waste timber with respect to its PCP content.

The method has a quantification limit corresponding to 100 µg PCP per kilogram of wood material expressed as dry matter. The method described has a measurement range up to PCP contents of 25 mg/kg of dry matter. These figures refer to the given example (where an aliquot of 1 ml of the extract is used for acetylation, see 8.4).

NOTE 1 If lower quantification limits are required, a higher volume of extract aliquot can be used for derivatisation.

NOTE 2 This method could have some modifications with some wood species as hardwoods.

2 References

EN 212, *Wood preservatives - General guidance on sampling and preparation for analysis of wood preservatives and treated timber.*

EN 322, *Wood-based panels – Determination of moisture content.*

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987).*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results - Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.*

ISO 11465, *Soil quality - Determination of dry matter and water content on a mass basis - Gravimetric method.*

3 Safety precautions

Persons using this method should be familiar with normal analytical laboratory procedures and practice.

This method does not purport to address all the safety problems, if any, associated with its use.

It is the responsibility of the user to establish safety and health practices and to ensure compliance with any European or national regulatory conditions.

4 Principle

Pentachlorophenol is extracted from the wood material using methanol. The extracted pentachlorophenol is transformed to pentachlorophenol acetate by derivatisation of an aliquot of the extract in aqueous potassium carbonate solution with acetic anhydride. The acetate derivative formed is extracted from this aqueous solution with n-hexane and analysed by gas chromatography with electron capture detection.

5 Reagents

During the analysis, unless otherwise specified, use only reagents of recognized analytical grade which have been checked in advance as to not interfere with the analytical results, and water complying with grade 3 as defined in EN ISO 3696.

5.1 Acetic anhydride (C₄H₆O₃).