

Water quality - Determination of 15 polycyclic aromatic hydrocarbons (PAH) in water by HPLC with fluorescence detection after liquid-liquid extraction

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 17993:2004 sisaldab Euroopa standardi EN ISO 17993:2003 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 20.02.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 17993:2004 consists of the English text of the European standard EN ISO 17993:2003.</p> <p>This document is endorsed on 20.02.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This International Standard specifies a method using high performance liquid chromatography (HPLC) with fluorescence detection after liquid-liquid extraction for the determination of 15 selected PAH in drinking and ground water in mass concentrations greater than 0,005 ug/l (for each single compound) and surface waters in mass concentrations above 0,01 ug/l.</p>	<p>Scope:</p> <p>This International Standard specifies a method using high performance liquid chromatography (HPLC) with fluorescence detection after liquid-liquid extraction for the determination of 15 selected PAH in drinking and ground water in mass concentrations greater than 0,005 ug/l (for each single compound) and surface waters in mass concentrations above 0,01 ug/l.</p>
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ICS 13.060.50

Võtmesõnad:

English version

Water quality

**Determination of 15 polycyclic aromatic hydrocarbons
(PAH) in water by HPLC with fluorescence detection after
liquid-liquid extraction
(ISO 17993 : 2002)**

Qualité de l'eau – Dosage de 15 hydrocarbures aromatiques polycycliques (HAP) dans l'eau par HPLC avec détection par fluorescence après extraction liquide-liquide
(ISO 17993 : 2002)

Wasserbeschaffenheit – Bestimmung von 15 polycyclischen aromatischen Kohlenwasserstoffen (PAK) in Wasser durch HPLC mit Fluoreszenzdetektion nach Flüssig-Flüssig-Extraktion
(ISO 17993 : 2002)

This European Standard was approved by CEN on 2003-11-03.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Management Centre: rue de Stassart 36, B-1050 Brussels

Foreword

International Standard

ISO 17993 : 2002 Water quality – Determination of 15 polycyclic aromatic hydrocarbons (PAH) in water by HPLC with fluorescence detection after liquid-liquid extraction,

which was prepared by ISO/TC 147 'Water quality' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 230 'Water analysis', the Secretariat of which is held by DIN, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by May 2004 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 17993 : 2002 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

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Introduction

Polycyclic aromatic hydrocarbons (PAH) occur in nearly all types of waters. These compounds are adsorbed on solids (sediments, suspended matter) as well as dissolved in the liquid phase.

Some PAH are known or suspected to cause cancer. The Council Directive 98/83/EC on the quality of water intended for human consumption set the maximum acceptable level for benzo(a)pyrene at 0,010 µg/l, and for the sum of four specified PAH [benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)-pyrene] at 0,100 µg/l.

WARNING — Some compounds being measured are presumed to be carcinogenic. Acetonitrile and hexane are toxic.

Persons using this International Standard should be familiar with normal laboratory practice. This International Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This International Standard specifies a method using high performance liquid chromatography (HPLC) with fluorescence detection after liquid-liquid extraction for the determination of 15 selected PAH (see Table 1) in drinking and ground water in mass concentrations greater than 0,005 µg/l (for each single compound) and surface waters in mass concentrations above 0,01 µg/l.

This method is, with some modification, also suitable for the analysis of wastewater. This method may be applicable to other PAH, provided the method is validated for each case.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 5667-2, *Water quality — Sampling — Part 2: Guidance on sampling techniques*

ISO 5667-3, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples*

ISO 8466-1, *Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics — Part 1: Statistical evaluation of the linear calibration function*

3 Principle

The PAH present in the aqueous sample are extracted from the water sample with hexane. The extract is concentrated by evaporation and the residue taken up in a solvent appropriate for HPLC analysis.

If necessary, extracts of surface water or more contaminated water samples are cleaned by chromatography over silica prior to analysis.

PAH are separated by HPLC on a suitable stationary phase using gradient elution. Identification and quantification is performed by means of fluorescence detection with wavelength programming for both the excitation and the emission wavelength.

NOTE If only a limited number of PAH are to be determined, separation can also be performed under isocratic conditions.