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Water quality — Determination of 16 polycyclic aromatic hydrocarbons (PAH) in water — Method using gas chromatography with mass spectrometric detection (GC-MS)

Qualité de l'eau — Détermination de 16 hydrocarbures aromatiques polycycliques (HAP) dans l'eau — Méthode par chromatographie en phase gazeuse avec détection par spectrométrie de masse (CG-SM)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 28540 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

Introduction

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

ISO 17993[7] specifies methods for the determination of 15 PAH by high performance liquid chromatography in drinking water, ground water, and surface water.

ISO 7981-1[3] and ISO 7981-2[4] specify methods for the determination of 6 PAH by high performance thin layer chromatography or by high performance liquid chromatography in drinking water and ground water.

This International Standard describes a method for at least 16 PAH using gas chromatography with mass spectrometric detection (GC-MS) in drinking water, ground water and surface water.

Some PAH are known or suspected to cause cancer. Maximum acceptable levels have been set in a number of countries. For instance, the European Council Directive 98/83/EC on the quality of water intended for human consumption (Reference [10]) 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.

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WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This 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.

IMPORTANT — It is absolutely essential that tests conducted according to this International Standard be carried out by suitably trained staff.

1 Scope

This International Standard specifies a method for the determination of at least 16 selected PAH (see Table 1) in drinking water and ground water in mass concentrations above 0,005 µg/l and in surface water in mass concentrations above 0,01 µg/l (for each individual compound).

This International Standard can be used for samples containing up to 150 mg/l of suspended matter.

This method is, with some modification, also suitable for the analysis of waste water. It is possible that this method is applicable to other PAH, provided the method is validated for each case.

2 Normative references

The following referenced documents are indispensable for the application 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 5667-1, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes and sampling techniques*

ISO 5667-3, *Water quality — Sampling — Part 3: Preservation and handling of water 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 Terms and definitions

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

3.1
analyte
substance to be determined

[ISO 15089:2000[5], 3.2]

NOTE Substances determinable by this International Standard are listed in Table 1.