
**Water quality — Determination of
polycyclic aromatic hydrocarbons
(PAH) —**

**Part 1:
Determination of six PAH by high-
performance thin-layer chromatography
with fluorescence detection after
liquid-liquid extraction**

*Qualité de l'eau — Détermination des hydrocarbures aromatiques
polycycliques (HAP) —*

*Partie 1: Dosage de six HAP par chromatographie de haute
performance sur couche mince avec détection fluorimétrique à la suite
d'une extraction liquide-liquide*



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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 7981-1 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

ISO 7981 consists of the following parts, under the general title *Water quality — Determination of polycyclic aromatic hydrocarbons (PAH)*:

- *Part 1: Determination of six PAH by high-performance thin-layer chromatography with fluorescence detection after liquid-liquid extraction*
- *Part 2: Determination of six PAH by high-performance liquid chromatography with fluorescence detection after liquid-liquid extraction*

Introduction

Polycyclic aromatic hydrocarbons (PAH) are present in nearly all types of waters. These substances 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 maximum acceptable levels of PAH in waters intended for human consumption are given in European Legislation [1] [2] [3] [4].

The sum of the mass concentrations of the six PAH specified in this part of ISO 7981 normally is about 0,01 µg/l to 0,05 µg/l in ground water and up to 1 µg/l in surface water.

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Water quality — Determination of polycyclic aromatic hydrocarbons (PAH) —

Part 1:

Determination of six PAH by high-performance thin-layer chromatography with fluorescence detection after liquid-liquid extraction

WARNING — Some substances being measured are presumed to be carcinogenic. Acetonitrile and hexane are harmful.

Persons using this part of ISO 7981 should be familiar with normal laboratory practise. 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 of this part of ISO 7981 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 part of ISO 7981 be carried out by suitably trained staff.

1 Scope

This part of ISO 7981 specifies the determination of six selected PAH in drinking water by high-performance thin-layer chromatography with fluorescence detection after liquid-liquid extraction. The six PAH are: fluoranthene, benzo[b]fluoranthene, benzo[a]pyrene, benzo[k]fluoranthene, indeno[1,2,3-cd]pyrene, and benzo[ghi]perylene (see Table 1).

A screening method (method A) is described to exclude those samples containing less than 20 % of the limit values given in References [1], [2], [3] and [4].

A quantitative method (method B) is also described, with a working range of 40 ng/l to 240 ng/l (sum of 6 PAH). Higher concentrations can be determined by using a smaller aliquot of the sample.

With some modifications, this method is also applicable for the analysis of ground waters and moderately polluted surface waters.

2 Principle

Since PAH can to a large extent be adsorbed on particulate matter, the whole test sample is analysed.

NOTE For the analysis of surface water, a differentiation between dissolved and undissolved PAH may be desirable, but this is not relevant for drinking water.

PAH are extracted from the water sample by liquid-liquid extraction. The extract is evaporated to dryness and the residue is taken up in a solvent and analysed.

Extracts of surface waters and other contaminated water samples should be cleaned prior to analysis (7.4).