INTERNATIONAL STANDARD

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Water quality — Determination of highly volatile halogenated hydrocarbons — Gas-chromatographic methods

Qualité de l'eau — Dosage des hydrocarbures halogénés hautement volatils — Méthodes par chromatographie en phase gazeuse



Reference number ISO 10301:1997(E)

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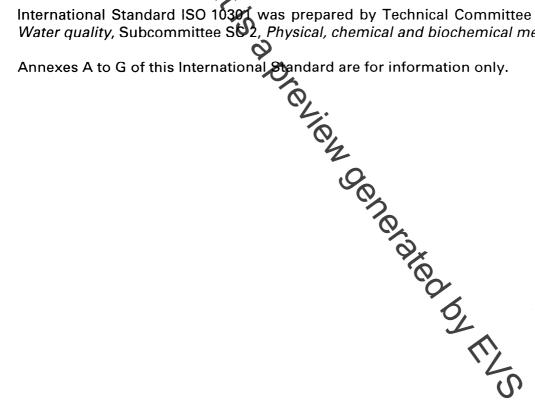
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Foreword

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 Obselv with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for oting. Publication as an International Standard requires approval by at least 75 % whe member bodies casting a vote.

International Standard ISO 10397 was prepared by Technical Committee ISO/TC 147, Water quality, Subcommittee SO2, Physical, chemical and biochemical methods.



Introduction

Highly volatile halogenated hydrocarbons are used in industrial, commercial and domestic fields, and can enter a water body via waste water and may consequently contaminate driving water. Furthermore, they can originate from the use of chlorine as an oxidizing agent in water and waste-water treatment. They also can be introduced by imppropriate handling. In addition, they can be formed by decomposition of higher molecular mass organohalogen derivatives.

In uncontaminated ground water and rain water, the concentrations of halogenated hydrocarbons are generally below 0,1 µg/l. In surface water they may be higher, depending on the origin and quality of the water. In untreated waste water the

hydrocarbons are generally below 0,1 µg/l. In surface water they may be higher, depending on the origin and quality of the water. In untreated waste water the concentrations may reach seturation of the aqueous phase. In general, the solubility of these compounds in organize solvents and in fatty material exceeds their solubility in water.

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Water quality — Determination of highly volatile halogenated hydrocarbons — Gas-chromatographic methods

Section 1 : General

1.1 Scope

This International Standard specifies two methods for the determination of highly volatile halogenated hydrocarbons using gas chromatography.

Section 2 specifies a method for the determination by liquid/liquid extraction of highly volatile halogenated hydrocarbons in drinking water, ground water, swimming pool water, most rivers and lakes and many sewage and industrial effluents. Typical values of "quantification limits" are given in table 1.

Table 1 — Typical values of "quantification limits" for some highly volatile halogenated hydrocarbons using liquid/liquid extraction

| Compound | Quantification limits |
|--------------------------------|-----------------------|
| Ŷ | μg/l |
| Dichloromethane | 50 |
| Chloroform 🚫 | 0,05 - 0,3 |
| Carbon tetrachloride | 0,01 - 0,1 |
| 1,1-Dichloroethane | 1,0 - 5 |
| 1,2-Dichloroethane | 5 - 10 |
| 1,1,1-Trichloroethane | 0,02 - 0,1 |
| 1,1,2,2-Tetrachloroethane | 0,00 - 0,1 |
| Hexachloroethane | 0,01 0,05 |
| cis-1,2-Dichloroethylene | 5 - 50 |
| trans-1,2-Dichloroethylene | 1 - 10 |
| Trichloroethylene | 0,05 - 0,1 🚫 |
| Tetrachloroethylene | 0,1 |
| Hexachlorobutadiene | 0,01 |
| Tribromomethane | 0,1 |
| 1,1,2-Trichlorotrifluoroethane | 0,1 |

Section 3 specifies a method for the determination of highly volation halogenated hydrocarbons in drinking water, surface waters and ground water by a static head-space method. Typical values of "quantification limits" are given in table 2.

In practise, the head-space method is applicable for industrial effluents as a screening method, but in some cases it is necessary to confirm the result by the liquid-liquid extraction method.

NOTE: When applying this International Standard, the guide on analytical quality control for water analysis (see ISO/TR 13530) should be followed, especially for the calibration steps.