

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

The European Standard EN ISO 10301:1997 has the status of a British Standard

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Amendments issued since publication

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Contents

	Page
National foreword	ii
Foreword	2
Foreword	iv
Text of ISO 10301	1

National foreword

This British Standard is the English language version of EN ISO 10301:1997. It is identical with ISO 10301:1997.

The UK participation in its preparation was entrusted by Technical Committee EH/3, Water quality, to Subcommittee EH/3/2, Physical, chemical and biochemical methods, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

BS EN ISO 10301 is one of a series of standards on water quality, others of which have been, or will be, published as Sections of BS 6068. This standard has therefore been given the secondary identifier BS 6068-2.58. The various Sections of BS 6068 comprise Parts 1 to 7, which, together with Part 0, are listed below.

- *Part 0: Introduction;*
- *Part 1: Glossary;*
- *Part 2: Physical, chemical and biochemical methods;*
- *Part 3: Radiological methods;*
- *Part 4: Microbiological methods;*
- *Part 5: Biological methods;*
- *Part 6: Sampling;*
- *Part 7: Precision and accuracy.*

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN ISO title page, page 2, the ISO title page, pages ii to iv, pages 1 to 29 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

English version

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

(ISO 10301:1997)

Qualité de l'eau — Dosage des hydrocarbures halogénés hautement volatils — Méthodes par chromatographie en phase gazeuse
(ISO 10301:1997)

Wasserbeschaffenheit — Bestimmung leichtflüchtiger halogenierter Kohlenwasserstoffe — Gaschromatographische Verfahren (ISO 10301:1997)

This European Standard was approved by CEN on 1997-03-28. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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CEN

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

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

The text of the International Standard ISO 10301:1997 has been prepared by Technical Committee ISO/TC 147 “Water quality” in collaboration with Technical Committee CEN/TC 230 “Water analysis”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1997, and conflicting national standards shall be withdrawn at the latest by October 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 10301:1997 was approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO 10301

First edition
1997-04-15

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*



Contents

	Page
Foreword	iv
Introduction	1
Section 1. General	
1.1 Scope	1
1.2 Normative references	2
1.3 Definition	2
Section 2. Liquid/liquid extraction and analysis by gas chromatography	
2.1 Principle	3
2.2 Interferences	3
2.3 Reagents	3
2.4 Apparatus	4
2.5 Sampling and sample preparation	4
2.6 Procedure	5
2.7 Calibration	6
2.8 Identification and evaluation	8
2.9 Expression of results	10
2.10 Precision data	10
2.11 Test report	11
Section 3. Static headspace method and analysis by gas chromatography	
3.1 Principle	12
3.2 Interferences	12
3.3 Reagents	12
3.4 Apparatus	12
3.5 Sampling	12
3.6 Procedure	13
3.7 Calibration	13
3.8 Identification and evaluation	15
3.9 Expression of results	16
3.10 Precision data	16
3.11 Test report	17
Annex A (informative) Characteristics of highly volatile halogenated hydrocarbons	18
Annex B (informative) Examples of gas chromatograms for highly volatile halogenated hydrocarbons	23
Annex C (informative) Example of a microseparator	27
Annex D (informative) Sensitivity of electron-capture detector	28
Annex E (informative) Extraction recovery with pentane	28
Annex F (informative) Qualitative method for testing the quality of “penicillin type” stoppers	29
Annex G (informative) Collection of samples	29
Figure B.1 — Chromatograms of standards simultaneously injected on two capillary columns	24
Figure B.2 — Example of gas chromatogram of highly volatile halogenated hydrocarbons	26
Figure C.1 — Microseparator	27
Table 1 — Typical values of “quantification limits” for some highly volatile halogenated hydrocarbons using liquid/liquid extraction	1
Table 2 — Typical values of “quantification limits” for some highly volatile halogenated hydrocarbons using static head-space method	1
Table 3 — Explanation of the subscripts used in the symbols	6
Table 4 — Standard deviations of tap water	10

	Page
Table 5 — Precision data for drinking water	10
Table 6 — Precision data for waste water	11
Table 7 — Precision data for drinking water	16
Table 8 — Precision data for waste water	17
Table D.1 — Relative sensitivity of the electron-capture detector, related to chlorobenzene = 100 % (guide values)	28
Table E.1 — Example of extraction recovery with pentane from drinking water	28

Descriptors: Water, quality, water pollution, water tests, chemical analysis, determination of content, halohydrocarbons, gas phase chromatography.

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.

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.

International Standard ISO 10301 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

Annex A to Annex G of this International Standard are for information only.

Section 1. General

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 drinking 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 inappropriate 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 concentrations may reach saturation of the aqueous phase. In general, the solubility of these compounds in organic solvents and in fatty material exceeds their solubility in water.

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 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	0,05 – 0,1
Hexachloroethane	0,01 – 0,05
<i>cis</i> -1,2-Dichloroethylene	5 – 50
<i>trans</i> -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 volatile 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.

Table 2 — Typical values of “quantification limits” for some highly volatile halogenated hydrocarbons using static head-space method

Compound	Quantification limits µg/l
Dichloromethane	50
Chloroform	0,3
Carbon tetrachloride	0,1
1,1-Dichloroethane	100
1,2-Dichloroethane	100
1,1,1-Trichloroethane	0,1
1,1,2-Trichloroethane	20
1,1-Dichloroethylene	10
<i>cis</i> -1,2-Dichloroethylene	50
<i>trans</i> -1,2-Dichloroethylene	25
Trichloroethylene	0,2
Tetrachloroethylene	0,2
1,2-Dichloropropane	50
1,3-Dichloropropane	200
<i>cis+trans</i> -1,3-Dichloropropylene	10
Dibromomethane	0,3
Tribromomethane (Bromoform)	5
1,2-Dibromoethane	2
Bromochloromethane	1
Bromodichloromethane	0,2
Dibromochloromethane	0,3
1,1,3-Trifluoroethane	1

1.2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5667-1:1980, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes*.

ISO 5667-2:1991, *Water quality — Sampling — Part 2: Guidance on sampling techniques*.

ISO/TR 13530:—, *Water quality — Guide to analytical quality control for water analysis*¹⁾.

1.3 Definition

For the purposes of this International Standard, the following definition applies:

1.3.1

highly volatile halogenated hydrocarbons

fluorinated, chlorinated, brominated and/or iodinated mainly nonaromatic hydrocarbons composed of one to six atoms of carbon

NOTE Their boiling points generally fall within the range of 20 °C to 220 °C at atmospheric pressure (see Annex A).

¹⁾ In preparation.