

This is a preview of "ISO 17858:2007". Click here to purchase the full version from the ANSI store.

First edition
2007-02-15

Water quality — Determination of dioxin-like polychlorinated biphenyls — Method using gas chromatography/mass spectrometry

Qualité de l'eau — Dosage des biphenyles polychlorés de type dioxine — Méthode par chromatographie en phase gazeuse/spectrométrie de masse



Reference number
ISO 17858:2007(E)

© ISO 2007

This is a preview of "ISO 17858:2007". Click here to purchase the full version from the ANSI store.

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO 17858:2007". Click here to purchase the full version from the ANSI store.

Contents

Page

Foreword.....	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	2
3.1 Terms and definitions.....	2
3.2 Abbreviated terms	3
4 Principle	4
4.1 Spiking and extraction	4
4.2 Clean-up.....	4
4.3 Concentration.....	4
4.4 Identification.....	5
4.5 Quantification.....	5
4.6 Analytical quality	5
5 Contamination and interferences.....	5
6 Reagents and standards	6
7 Apparatus and materials	10
7.1 Sampling equipment for discrete sampling.....	10
7.2 Equipment for sample preparation	11
7.3 Extraction apparatus	11
7.4 Filtration apparatus	12
7.5 Clean-up apparatus	12
7.6 Concentration apparatus	13
7.7 Other equipment	13
8 Sample collection, preservation, storage and holding times	14
9 Quality assurance (QA)/quality control (QC)	14
9.1 General.....	14
9.2 Initial precision and recovery (IPR).....	15
9.3 Spiking	15
9.4 Recovery of labelled compounds assessment.....	16
9.5 Method blanks	16
9.6 QC check sample	16
9.7 Method precision	16
10 Calibration	17
10.1 Operating conditions.....	17
10.2 Mass spectrometer (MS) resolution.....	17
10.3 Ion abundance ratios, minimum levels, signal-to-noise ratios, and absolute retention times.....	17
10.4 Retention time	18
10.5 Isomer specificity.....	18
10.6 Calibration by isotope dilution	18
10.7 Calibration by internal standard.....	19
10.8 Combined calibration	19
11 Sample preparation	20
11.1 General.....	20

This is a preview of "ISO 17858:2007". Click here to purchase the full version from the ANSI store.

11.2	Determination of percent suspended solids	20
11.3	Preparation of aqueous samples containing 1 % of suspended solids or less	21
12	Extraction and concentration	22
12.1	Separatory funnel extraction of filtrates and of aqueous samples that are visibly absent of particles.....	22
12.2	Solid-phase extraction (SPE) of samples containing less than 1 % suspended solids	22
12.3	Soxhlet extraction of filters and/or disks	23
12.4	Back-extraction with acid and base	24
12.5	Macro-concentration.....	24
12.6	Micro-concentration and solvent exchange.....	26
13	Extract clean-up	26
13.1	General	26
13.2	Gel permeation chromatography (GPC)	27
13.3	Silica clean-up	28
13.4	Alumina clean-up	28
13.5	Carbon column	29
13.6	High performance liquid chromatography (HPLC)	29
13.7	Florisil clean-up.....	30
13.8	Silver nitrate/silica column.....	31
14	HRGC/HRMS analysis	31
15	System and laboratory performance	31
15.1	General	31
15.2	MS resolution.....	31
15.3	Calibration verification	31
15.4	GC resolution.....	32
15.5	Blank.....	32
16	Qualitative determination	32
17	Quantitative determination.....	32
17.1	Isotope dilution quantification.....	32
17.2	Internal standard quantification and labelled-compound recovery.....	33
17.3	Concentration in sample	34
17.4	Results and reporting	35
17.5	Toxic equivalents (TEQ)	35
18	Analysis of complex samples	36
18.1	General	36
18.2	Recovery of labelled compounds.....	36
19	Pollution prevention	36
20	Waste management	37
21	Precision	37
	Annex A (informative) Example chromatograms	45
	Annex B (informative) Use of HRGC/LRMS.....	47
	Annex C (informative) Precision data	50
	Bibliography	54
	Table 1 — Dioxin-like PCBs determined by this method	38
	Table 2 — Suggested quantification relationships.....	39
	Table 3 — Suggested calibration standard concentrations	40
	Table 4 — Suggested concentration of dioxin-like PCBs in stock and spiking solutions	41
	Table 5 — Typical GC columns and temperature programs	42

This is a preview of "ISO 17858:2007". Click here to purchase the full version from the ANSI store.

Table 6 — Examples of toxic equivalent factors	43
Table 7 — Congener function groups and ions.....	44
Table B.1 — TetraCBs	49
Table B.2 — PentaCBs	49
Table B.3 — HexaCBs.....	49
Table B.4 — HeptaCBs	49
Table C.1 — Spiking amounts transferred to sample bottles	50
Table C.2 — Samples 1 and 2 (fortified industrial effluent) — Statistical summary	51
Table C.3 — Sample 3 (unfortified industrial effluent) — Statistical summary	52
Table C.4 — Sample 4 (HPLC water) — Statistical summary	53

This is a preview of "ISO 17858:2007". Click here to purchase the full version from the ANSI store.

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 17858 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

This is a preview of "ISO 17858:2007". Click here to purchase the full version from the ANSI store.

Introduction

When using this International Standard, it may be necessary in some cases to determine whether and to what extent particular problems will require the specification of minor additional conditions.