

Water quality — Determination of selected phenoxyalkanoic herbicides, including bentazones and hydroxybenzonitriles by gas chromatography and mass spectrometry after solid phase extraction and derivatization

The European Standard EN ISO 15913:2003 has the status of a British Standard

ICS 13.060.50

Confirmed July 2008

National foreword

This British Standard is the official English language version of EN ISO 15913:2003. It is identical with ISO 15913:2000.

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.

This is one of a series of standards on water quality that have been published as sections of BS 6068. The various sections of BS 6068 are comprised within 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*.

As and when the different sections of BS 6068 are amended or revised, they will be renumbered with the identifier of the corresponding international standard. For example, this standard has been renumbered from BS 6068-2.70 to BS EN ISO 15913:2003.

NOTE The test described in this British Standard should only be carried out by suitable qualified persons with the appropriate level of chemical expertise. Standard chemical procedures should be followed throughout.

Cross-references

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, pages ii to iv, pages 1 to 22, the Annex ZA page and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments
14422	18 June 2003	Renumbers BS 6068-2.70:2000 as BS EN ISO 15913:2003

This British Standard, having been prepared under the direction of the Health and Environment Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 June 2000

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English version

Water quality — Determination of selected phenoxyalkanoic herbicides, including bentazones and hydroxybenzonitriles by gas chromatography and mass spectrometry after solid phase extraction and derivatization (ISO 15913:2000)

Qualité de l'eau — Dosage de certains herbicides phénoxyalcanoïques, y compris bentazones et hydroxybenzonitriles, par chromatographie en phase gazeuse et spectrométrie de masse après extraction en phase solide et dérivatisation (ISO 15913:2000)

Wasserbeschaffenheit — Bestimmung ausgewählten Phenoxyalkancarbonsäure-Herbiziden, einschließlich Bentazon und Hydroxybenzonitrilen mittels Gaschromatographie und massenspektrometrischer Detektion nach Fest-Flüssig-Extraktion und Derivatisierung (ISO 15913:2000)

This European Standard was approved by CEN on 9 January 2003.

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 Management Centre or to any CEN member.

This European Standard exists 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

The text of ISO 15913:2000 has been prepared by Technical Committee ISO/TC 147, Water quality, of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15913:2003 by 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 September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

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

Endorsement notice

The text of ISO 15913:2000 has been approved by CEN as EN ISO 15913:2003 without any modifications.

NOTE Normative references to International Standards are listed in Annex ZA (normative).

INTERNATIONAL STANDARD

ISO
15913

First edition
2000-04-01

Water quality — Determination of selected phenoxyalkanoic herbicides, including bentazones and hydroxybenzonitriles by gas chromatography and mass spectrometry after solid phase extraction and derivatization

Qualité de l'eau — Dosage de certains herbicides phénoxyalcanoïques, y compris bentazones et hydroxybenzonitriles, par chromatographie en phase gazeuse et spectrométrie de masse après extraction en phase solide et dérivatisation



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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15913 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

Annexes A, B, C and D of this International Standard are for information only.

Water quality — Determination of selected phenoxyalkanoic herbicides, including bentazones and hydroxybenzonitriles by gas chromatography and mass spectrometry after solid phase extraction and derivatization

WARNING — Diazomethane is explosive, extremely toxic and severely irritating, causing pulmonary oedema when inhaled in high concentrations. Long-term, low-level exposure may lead to sensitization, resulting in asthma-like symptoms. Also, diazomethane and several of its chemical precursors have been cited as carcinogens.

1 Scope

This International Standard specifies a method for the determination of phenoxyalkanoic acids in ground and drinking water in mass concentrations ≥ 50 ng/l (detailed information is given in Table A.1 of annex A). Examples of phenoxyalkanoic acids which can be determined by this method are given in Table 1.

This method may be applicable to compounds not mentioned in Table 1 or to other types of water. However, it is necessary to verify the applicability of this method for these special cases (see annex B).

Table 1 — Plant treatment agents determined by this method

Name	Molecular formula	Relative molecular mass	CAS registry No.
(2,4-Dichlorophenoxy) acetic acid	$C_8H_6Cl_2O_3$	221,0	94-75-7
Mecoprop	$C_{10}H_{11}ClO_3$	214,65	93-65-2
Dichlorprop	$C_9H_8Cl_2O_3$	235,06	120-36-5
MCPA	$C_9H_9ClO_3$	200,6	94-74-6
MCPB	$C_{11}H_{13}ClO_3$	228,67	94-81-5
(2,4,5-Trichlorophenoxy)acetic acid	$C_8H_5Cl_3O_3$	255,5	93-76-5
Bentazone	$C_{10}H_{12}N_2O_3S$	240,3	25057-89-0
Bromoxynil	$C_7H_3Br_2NO$	276,9	1689-84-5
4-(2,4-Dichlorophenoxy)-butanoic acid	$C_{10}H_{10}Cl_2O_3$	249,1	94-82-6
Fenoprop	$C_9H_7Cl_3O_3$	269,51	93-72-1

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC 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 5667-3:1994, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples*.

3 Term, definition, abbreviations and subscripts

3.1 Term and definition

For the purposes of this International Standard, the following term and definition applies.

3.1.1

phenoxyalkanoic herbicides

herbicides which undergo derivatization with diazomethane and which may subsequently be determined by gas chromatography

EXAMPLE Typical phenoxyalkanoic herbicides include alkylhalogenated phenoxy acids, hydroxybenzonitriles and bentazone.

3.2 Abbreviations

2,4-D (2,4-dichlorophenoxy) acetic acid

2,4-DB 4-(2,4-dichlorophenoxy) butanoic acid

2,4-DP dichlorprop

MCPP mecoprop

2,4,5-T (2,4,5-trichlorophenoxy) acetic acid

2,4-TP fenoprop

3.3 Subscripts

c calibration step using an external standard

g overall procedure

i identity of the substance *i*

is internal standard

j consecutive figure *j* for pairs of values

sam sample

sol solvent