

Water quality - Preparation and treatment of poorly water-soluble organic compounds for the subsequent evaluation of their biodegradability in an aqueous medium (ISO 10634:2018)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Water quality - Preparation and treatment of poorly
water-soluble organic compounds for the subsequent
evaluation of their biodegradability in an aqueous medium
(ISO 10634: 2018)

Qualité de l'eau - Préparation et traitement des
composés organiques peu solubles dans l'eau en vue de
l'évaluation de leur biodégradabilité en milieu aqueux
(ISO 10634:2018)

Wasserbeschaffenheit - Anleitung für die Vorbereitung
und Behandlung von in Wasser schwer löslichen
organischen Verbindungen für die nachfolgende
Bestimmung ihrer biologischen Abbaubarkeit in einem
wässrigen Medium (ISO 10634:2018)

This European Standard was approved by CEN on 20 October 2018.

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

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European foreword

This document (EN ISO 10634:2018) 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of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 10634:1995.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 10634:2018 has been approved by CEN as EN ISO 10634:2018 without any modification.

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Presentation of suitable preparation and analytical methods	2
4.1 Preparation methods	2
4.2 Analytical methods	2
5 Direct addition and addition with inert support	2
5.1 General	2
5.2 Reagents	3
5.3 Apparatus	3
5.4 Procedure	3
5.4.1 Direct addition	3
5.4.2 Addition on inert support	4
6 Ultrasonic and physical treatment	4
6.1 General	4
6.2 Apparatus	4
6.3 Procedure using an ultrasonic probe	4
6.3.1 Preparation of the test compound	4
6.3.2 Experimental protocol	5
6.4 Procedure using an ultrasonic bath	5
6.5 Other methods	5
7 Adsorption on an inert support with a volatile solvent removed from the system	6
7.1 General	6
7.2 Reagents	6
7.3 Apparatus	6
7.4 Procedure	6
8 Addition with a non-biodegradable solvent or emulsifying agent	7
8.1 General	7
8.2 Reagents	7
8.3 Apparatus	8
9 Preliminary tests	9
9.1 Reagents	9
9.1.1 Selection of emulsifying agent concentration	9
9.1.2 Selection of mineral oil concentration	9
9.1.3 Selection of silicone oil concentration	9
9.2 Procedure	9
9.2.1 Use of solvent	9
9.2.2 Use of emulsifying agent	10
9.2.3 Use of mineral oil	10
9.2.4 Use of silicone oil	10
9.3 Other additives	11
10 Combination of methods	11
11 Test report	11
Annex A (informative) Examples of biodegradability curves	13
Bibliography	15

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 5, *Biological methods*.

This second edition cancels and replaces the first edition (ISO 10634:1995), which has been technically revised to take into account user feedback, new technologies and available reagents.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The standardizing work carried out by ISO/TC 147/SC 5 has shown that the development of a single method for evaluating the biodegradability of organic compounds with a low solubility in water (i.e. < 100 mg/l[1][2][3]) cannot be envisaged in the immediate future. In fact, the selection of the most suitable working method to obtain a satisfactory emulsion or dispersion of these compounds in the test media depends particularly on their physicochemical properties. Consequently, the selection of the most suitable method has to be left to the judgement of laboratories responsible for the tests based on their experience and the product information supplied by the applicant. For this reason, this document describes various techniques for treating poorly water-soluble organic compounds before they are investigated for biodegradability tests. The objective is to reach a stage where, for any given technique, the same working method is used by all laboratories, thus making it easier to compare results. Specificities of the selected protocol should be kept in mind for the evaluation and interpretation of the results of the biodegradation test.

The techniques described in this document will not necessarily produce the same biodegradability results of the test compound if they are used in parallel. The use of solvents and dispersing or emulsifying techniques can be additional sources of uncertainty and can lead to test results which differ from those obtained without using these techniques. Furthermore, dispersions or emulsions can be produced that would not exist as such in nature. It is recommended to perform biodegradability tests with the direct addition of a test compound and using dispersion techniques in parallel because activity of inoculum used should be comparable. The presence of microorganisms with potential to degrade the test compound is assumed to be identical. The composition and activity might change when the tests are conducted subsequently.

According to current standards for testing biodegradability, only pure or compounds containing a low amount of impurities should be tested. Biodegradability tests are not recommended for heterogeneous mixtures or multicomponent compounds as the results of such tests are difficult to interpret, especially when the degradation is partial. Moreover, the use of solvents and dispersion techniques can lead to unrepresentative heterogeneous distributions and to misleading test results in the subsequent biodegradability tests.

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WARNING — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices.

IMPORTANT — It is absolutely essential that tests conducted in accordance with this document be carried out by suitably qualified staff.

1 Scope

This document specifies techniques for preparing poorly water-soluble organic compounds (i.e. liquid and solid compounds) with a solubility in water of less than approximately 100 mg/l and introducing them into test vessels for a subsequent biodegradability test in an aqueous medium using standard methods.

The subsequent tests on biodegradability are primarily methods using the analysis of the released carbon dioxide described in ISO 9439 and the determination of the oxygen described in ISO 9408 and following the usual precautions for ISO 10707. Thus, one can notice that the methods measuring the removal of dissolved organic carbon (DOC) are not appropriate.

This document does not specify the biodegradation test methods. It is restricted to describing techniques for introducing the test compounds into the test medium and to keeping them in a dispersed state^[4]. These techniques are implemented while observing the experimental conditions described in the standardized methods for evaluating biodegradability. ISO 9439, based on CO₂ evolution, is not suitable for testing volatile compounds.

Some of the preparation methods described in this document might not be accepted by regulators for making conclusions on the ready biodegradability of tested compounds.

Examples of biodegradability curves are given in [Annex A](#).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9408, *Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium by determination of oxygen demand in a closed respirometer*

ISO 9439, *Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium — Carbon dioxide evolution test*

ISO 10707, *Water quality — Evaluation in an aqueous medium of the “ultimate” aerobic biodegradability of organic compounds — Method by analysis of biochemical oxygen demand (closed bottle test)*

3 Terms and definitions

No terms and definitions are listed in this document.