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Second edition  
2018-10

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## **Water quality — Preparation and treatment of poorly water-soluble organic compounds for the subsequent evaluation of their biodegradability in an aqueous medium**

*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*



Reference number  
ISO 10634:2018(E)

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Published in Switzerland

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## Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Presentation of suitable preparation and analytical methods</b> .....	<b>2</b>
4.1 Preparation methods.....	2
4.2 Analytical methods.....	2
<b>5 Direct addition and addition with inert support</b> .....	<b>2</b>
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
<b>6 Ultrasonic and physical treatment</b> .....	<b>4</b>
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
<b>7 Adsorption on an inert support with a volatile solvent removed from the system</b> .....	<b>6</b>
7.1 General.....	6
7.2 Reagents.....	6
7.3 Apparatus.....	6
7.4 Procedure.....	6
<b>8 Addition with a non-biodegradable solvent or emulsifying agent</b> .....	<b>7</b>
8.1 General.....	7
8.2 Reagents.....	7
8.3 Apparatus.....	8
<b>9 Preliminary tests</b> .....	<b>9</b>
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
<b>10 Combination of methods</b> .....	<b>11</b>
<b>11 Test report</b> .....	<b>11</b>
<b>Annex A (informative) Examples of biodegradability curves</b> .....	<b>13</b>
<b>Bibliography</b> .....	<b>15</b>

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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.

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](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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](http://www.iso.org/members.html).

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## 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<sup>[1][2][3]</sup>) 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.