

First edition
2002-11-15

Corrected version
2003-08-01

**Water quality — Evaluation of the aerobic
biodegradability of organic compounds at
low concentrations —**

Part 1:

**Shake-flask batch test with surface water or
surface water/sediment suspensions**

*Qualité de l'eau — Évaluation de la biodégradabilité aérobie des composés
organiques présents en faibles concentrations —*

*Partie 1: Essai en lots de flacons agités avec des eaux de surface ou
des suspensions eaux de surface/sédiments*



Reference number
ISO 14592-1:2002(E)

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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

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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.

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 part of ISO 14592 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14592-1 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 5, *Biological methods*.

ISO 14592 consists of the following parts, under the general title *Water quality — Evaluation of the aerobic biodegradability of organic compounds at low concentrations*:

- *Part 1: Shake-flask batch test with surface water or surface water/sediment suspensions*
- *Part 2: Continuous flow river model with attached biomass*

This corrected version of ISO 14592-1:2002 incorporates corrections to

- the reference given in the third item of the list in 8.2.1;
- the reference given in the penultimate line of 8.2.1;
- the reference given in the last line of the second paragraph of 8.4.1.

Introduction

This International Standard consists of two parts. Part 1 describes a die-away batch test for either surface water with or without added sediment in suspension simulating either a pelagic aquatic environment or a water-to-sediment interface. Part 2 describes a continuous flow system simulating a river with biomass attached to stationary surfaces.

This test has been specifically designed to provide information on the biodegradation behaviour and kinetics of test compounds present in low concentrations, i.e. sufficiently low to ensure that they simulate the biodegradation kinetics which would be expected to occur in natural environmental systems.

Before conducting this test, it is necessary to have information on the biodegradability behaviour of the test compound at higher concentrations (e.g. in standard biodegradation tests), and, if possible, on abiotic degradability or elimination from water, as well as relevant physico-chemical data. This information is necessary for proper experimental planning and interpretation of results.

When this test method is used with a single environmental sample of surface water (either with or without the addition of sediment), a laboratory-derived first-order biodegradation rate can be estimated for one single point in time and space. The test system may be more consistent and provide more reliable biodegradation results if it is adapted to the test compound at a specifically maintained concentration. This may be achieved using the optional semi-continuous procedural variant of the method.

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Water quality — Evaluation of the aerobic biodegradability of organic compounds at low concentrations —

Part 1:

Shake-flask batch test with surface water or surface water/sediment suspensions

WARNING AND SAFETY PRECAUTIONS — Activated sludge, sewage and effluent contain potentially pathogenic organisms. Therefore appropriate precautions should be taken when handling them. Toxic and dangerous test compounds and those whose properties are unknown should be handled with care. Radiolabelled compounds, if used, should be handled respecting existing rules and legislation.

1 Scope

This part of ISO 14592 specifies a test method for evaluating the biodegradability of organic test compounds by aerobic microorganisms by means of a shake-flask batch test. It is applicable to natural surface water, free from coarse particles to simulate a pelagic environment ("pelagic test") or to surface water with suspended sediments added to obtain a level of 0,1 g/l to 1 g/l dry mass to simulate a water body with suspended sediment ("suspended sediment test").

This part of ISO 14592 is applicable to organic test compounds present in lower concentrations (normally below 100 µg/l) than those of natural carbon substrates also present in the system. Under these conditions, the test compounds serve as a secondary substrate and the kinetics for biodegradation would be expected to be first order ("non-growth" kinetics).

This test method is not recommended for use as proof of ultimate biodegradation which is better assessed using other standardized tests (see ISO/TR 15462). It is also not well suited to studies on metabolite formation and accumulation which require higher test concentrations.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 14592. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 14592 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/TR 15462, *Water quality — Selection of tests for biodegradability*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purpose of this part of ISO 14592, the following terms and definitions apply.