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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 19276.1-2026

Replacing GB/T 19276.1-2003

Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Part 1: Method by measuring the oxygen demand in a closed respirometer

水性培养液中材料最终需氧生物分解能力的测定 第1部分：采用测定密闭呼吸计中需氧量的方法

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 1 of GB/T 19276, "Determination of final aerobic biodegradability of materials in aqueous culture media".

The following sections have been released.

---Part 1: Method for determining oxygen demand using a closed respiration meter;

---Part 2: Methods for measuring released carbon dioxide.

This document replaces GB/T 19276.1-2003, "Determination of the final aerobic biodegradability of materials in aqueous culture media using density measurement methods".

The method for measuring oxygen demand in a closed-breathing meter, compared with GB/T 19276.1-2003, has the following main technical changes, except for structural adjustments and editorial modifications.

as follows.

- a) The scope has been changed (see Chapter 1, Chapter 1 of the 2003 edition);
 - b) The "principle" has been changed (see Chapter 4, Chapter 4 of the 2003 edition);
 - c) The "Test Environment" has been changed (see Chapter 5, Chapter 5 of the 2003 edition);
 - d) The word "Preparation" has been changed (see 6.2.1.5, 2003 version 6.2.1.5);
 - e) The preparation of inoculum has been amended (see 8.3, 2003 edition of 8.3);
 - f) The phrases "culture medium derived from wastewater treatment plants" and "culture medium derived from soil or compost" have been deleted (see section 8.3.1 of the 2003 edition).
- 8.3.2);
- g) The "Test Procedure" has been changed (see 8.4, 2003 edition of 8.4);
 - h) The presentation and interpretation of results has been changed (see 9.2, 2003 edition 9.2);
 - i) The validity of the results has been changed (see Chapter 10, Chapter 10 of the 2003 edition).

This document is equivalent to ISO 14851:2019 "Determination of final aerobic biodegradability of materials in aqueous culture media - Determination of biodegradability by means of density determination".

Methods for measuring oxygen demand in a closed-breathing meter.

The following minimal editorial changes have been made to this document.

---To align with existing standards, the standard title has been changed to "Determination of Final Aerobic Biodegradability of Materials in Aqueous Culture Media, Part 1" Part. Method for determining oxygen demand using a closed respiration meter;

---Appendix E has added table numbers.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Bio-based Materials and Degradable Products (SAC/TC380).

Introduction

With the increasing use of plastics, recycling and disposal have become a major issue. Recycling is the first choice, but complete recycling of plastics is...

It's difficult. For example, it's difficult to fully recycle plastic waste, which mainly comes from consumers. Additionally, some difficult-to-recycle plastics, such as those from fishing gear and personal items...

Plastic microbeads and water-soluble polymers from personal care products often leak into the environment from closed waste recycling systems.

Using biodegradable materials is one of the effective ways to solve these types of environmental problems. Plastic materials sent to composting facilities, such as products or packaging, are pre-processed.

These materials possess potential biodegradability. Therefore, determining the potential biodegradability of these materials and obtaining their biodegradability in the natural environment is crucial.

The performance indicators are therefore very important. GB/T 19276, "Determination of the final aerobic biodegradability of materials in aqueous culture media," aims to provide two...

The proposed method for determining the biodegradability of different materials consists of two parts.

---Part 1: Method for determining oxygen demand in a closed-circuit respirometer. The aim is to measure the oxygen consumed within the closed-circuit respirometer.

The aerobic biodegradability of plastic materials is determined by the amount of gas produced.

---Part 2: Method for determining the amount of carbon dioxide released. The purpose is to determine the plastic...

The aerobic biodegradability of the material.

Materials in aqueous culture medium ultimately undergo aerobic biological decomposition.

Capacity determination, Part 1: Measurement using a closed system Methods for measuring oxygen demand in a spirometer Warning. Wastewater, activated sludge, soil slopes, and compost may contain potentially pathogenic bacteria; therefore, appropriate protective measures should be taken during treatment.

Special care should be taken when handling compounds used in toxicity testing or compounds whose properties are unknown.

1 Scope

This document specifies the method for exposing test materials to an aqueous culture medium prepared from activated sludge under experimental conditions, and for measuring the density of the test materials.

A method for determining the aerobic biodegradability of materials, including plastics containing additives, by measuring the amount of oxygen consumed within a closed breathmeter.

If untreated activated sludge is used as inoculum, this experiment only simulates the biological decomposition process in a natural aquatic environment.

This method can be used to determine the potential biodegradability of test materials when using mixed or pre-exposed inoculum.

The experimental conditions used in this document may not be the optimal conditions for producing maximum biodegradability, but this document is designed to measure...

The potential biodegradability of a material or the biodegradability of a material in the natural environment.

Calculating carbon balance can improve the accuracy of assessments of biodegradability (optional, see Appendix E).

This document applies to the following materials.

---Natural and/or synthetic polymers, copolymers, or mixtures thereof;

---Plastic materials containing additives such as plasticizers, pigments, or other compounds;

---Water-soluble polymers;

---Materials that do not inhibit microorganisms within the inoculum under experimental conditions; inhibition can be applied to control or other methods.

The appropriate method shall be used to determine this (see, for example, ISO 8192). If the test material has an inhibitory effect on the inoculum, the test should be performed at a lower concentration.

Other inoculum or pre-exposed inoculum can be used at the tested concentration.