Designation: D6238 – 98 (Reapproved 2011)

Standard Test Method for Total Oxygen Demand in Water[1]

This standard is issued under the fixed designation D6238; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the determination of total oxygen demand in the range from 100 to 100 000 mg/L, in water and wastewater including brackish waters and brines (see 6.5). Larger concentrations, or samples with high suspended solids, or both, may be determined by suitable dilution of the sample.

1.1.1 Since the analysis is based on the change in oxygen reading of the carrier gas compared to that when a sample is introduced (see 4.1), the measurement range is a function of the amount of oxygen in the carrier gas. The higher the desired concentration range, the more oxygen required in the carrier gas. Under recommended conditions, the carrier gas concentration should be between two to four times the maximum desired oxygen demand.

1.1.2 The lower measurement range is limited by the stability of the baseline oxygen detector output. This signal is a function of the permeation system temperature, carrier gas flow rate, oxygen detector temperature, and reference sensor voltage. Combined, these variables limit the minimum recommended range to 2 to 100 mg/L.

1.1.3 The upper measurement range is limited by the maximum oxygen concentration in the carrier gas (100 %). With the recommended conditions of carrier gas concentration being two to four times the maximum oxygen demand, this limits the maximum possible oxygen demand to between 250 000 to 500 000 mg/L. However, as a practical application to water analysis, this test method will consider a maximum range of 100 000 mg/L.

1.2 This test method is applicable to all oxygen-demanding substances under the conditions of the test contained in the sample that can be injected into the reaction zone. The injector opening limits the maximum size of particles that can be injected. If oxygen-demanding substances that are water-insoluble liquids or solids are present, a preliminary treatment may be desired. These pretreatment methods are described in Annex A2.

1.3 This test method is particularly useful for measuring oxygen demand in certain industrial effluents and process streams. Its application for monitoring secondary sewage effluents is not established. Its use for the monitoring of natural waters is greatly limited by the interferences defined in Section 6.

1.4 In addition to laboratory analysis, this test method is applicable to on-stream monitoring. Sample conditioning techniques for solids pretreatment applications are noted in Annex A2.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D888 Test Methods for Dissolved Oxygen in Water
D1129 Terminology Relating to Water
D1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits (Withdrawn 2003)[3]
D1193 Specification for Reagent Water
D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water
D3370 Practices for Sampling Water from Closed Conduits
D3856 Guide for Management Systems in Laboratories Engaged in Analysis of Water
D5789 Practice for Writing Quality Control Specifications for Standard Test Methods for Organic Constituents (Withdrawn 2002)[3]
D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis

[1] This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.06 on Methods for Analysis for Organic Substances in Water.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

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