This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D7573 – 09 (Reapproved 2017)

Standard Test Method for Total Carbon and Organic Carbon in Water by High Temperature Catalytic Combustion and Infrared Detection[1]

This standard is issued under the fixed designation D7573; 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 carbon (TC), inorganic carbon (IC), total organic carbon (TOC), dissolved organic carbon (DOC), and non-purgable organic carbon (NPOC) in water, wastewater, and seawater in the range from 0.5 mg/L to 4000 mg/L of carbon. Higher levels may be determined by sample dilution. The sample is injected onto a quartz bed heated at 680ºC. The sample converts into a gaseous phase and forced through a layer of catalyst ensuring conversion of all carbon containing compounds to CO_2. A non-dispersive infrared (NDIR) detector measures the resulting CO_2.

1.2 For TOC and DOC analysis a portion of the sample is injected to determine TC or dissolved carbon (DC). A portion of the sample is then acidified and purged to remove the IC. The purged inorganic carbon is measured as TIC, or DIC. TOC or DOC is calculated by subtracting the inorganic fraction from the total carbon:

$$TOC = TC - IC$$

1.3 For NPOC analysis a portion of sample is acidified and purged to remove IC. The purged sample is then injected to determine NPOC.

1.4 This test method was used successfully with reagent water spiked with potassium hydrogen phthalate, sucrose, nicotinic acid, benzoquinone, sodium dodecyl benzene sulfonate, urea, acetic acid, and humic acid. It is the user's responsibility to ensure the validity of this test method for waters of untested matrices.

1.5 This test method is applicable only to carbonaceous matter in the sample that can be introduced into the reaction zone. The syringe needle or injector opening size generally limits the maximum size of particles that can be so introduced.

1.6 In addition to laboratory analyses, this test method may be applied to stream monitoring.

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

1.8 *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]

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

D4129 Test Method for Total and Organic Carbon in Water by High Temperature Oxidation and by Coulometric Detection

D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard, refer to Terminology D1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *inorganic carbon (IC), n*—carbon in the form of carbon dioxide, carbonate ion, or bicarbonate ion.

3.2.2 *total organic carbon (TOC), n*—carbon in the form of organic compounds.

3.2.3 *non-purgable organic carbon (NPOC), n*—carbon measured in a sample after acidification and sparging to remove inorganic carbon.

[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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