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: D8028 – 17

Standard Test Method for Measurement of Dissolved Gases Methane, Ethane, Ethylene, and Propane by Static Headspace Sampling and Flame Ionization Detection (GC/FID)[1]

This standard is issued under the fixed designation D8028; 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 the dissolved gases methane, ethane, ethylene, and propane in drinking, waste, and ground waters, including domestic wells whether naturally occurring or resulting from commercial activities, or both. This test method has an analytical range from 10 µg/L to 11 000 µg/L for methane, and 10 µg/L to 5000 µg/L for ethane, ethylene, and propane. If a sample has a dissolved gas concentration above the calibration range, the sample would require dilution. Other analytical ranges may be used as long as the instrument calibration encompasses the desired range and demonstrates adequate linearity.

1.2 This test method is applicable to samples collected at a nominal ambient pressure. Samples collected under high pressures, that is, above ambient pressure, may not be accurately analyzed using this method.

1.3 This test method is applicable to a variety of dissolved gases; however, for the present standard, only methane, ethane, ethylene, and propane were validated. In order to validate for a gas not listed in this method, the analyst would need to establish the saturation concentration of the new gas, and establish a valid curve, method detection limits, and demonstration of capability following the procedures outlined in this method.

1.4 It is the analyst's responsibility to ensure the validity of this test method for dissolved gases other than methane, ethane, ethylene, and propane and other sample matrices.

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

1.6 A single laboratory study was done in order to establish precision and bias for the surrogate (see Section 16).

1.7 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1129 Terminology Relating to Water

D1193 Specification for Reagent Water

D8006 Guide for Sampling and Analysis of Residential and Commercial Water Supply Wells in Areas of Exploration and Production (E&P) Operations

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E355 Practice for Gas Chromatography Terms and Relationships

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 *Federal Standards:*

40 CFR Part 136, Appendix B Definition and Procedure for the Determination of the Method Detection Limit, Revision 1.11[3]

PA-DEP 3686 Light Hydrocarbons in Aqueous Samples via Headspace and Gas Chromatography with Flame Ionization Detection (GC/FID), Revision 0, April 2012[4]

SW-846 Test Methods for Evaluating Solid Waste: Physical/

[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] Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, http://www.access.gpo.gov.

[4] Available from Pennsylvania Department of Environmental Protection (PA-DEP), Headquarters, Rachel Carson State Office Building, 400 Market Street, Harrisburg, PA 17101, http://www.dep.state.pa.us.

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