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Standard Guide for Analysis of Ethylene Product[1]

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1. Scope

1.1 This guide covers and provides direction for the analysis of ethylene product in a way that allows the analyst to know the possible test methods, the units of measure, and the potential concentrations range of possible components, so that the consistency of the analytical measurements is improved. This guide is not intended to be used, nor to be construed in any way, as a set of specifications for ethylene product.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 *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]

D2504 Test Method for Noncondensable Gases in C_2 and Lighter Hydrocarbon Products by Gas Chromatography

D2505 Test Method for Ethylene, Other Hydrocarbons, and Carbon Dioxide in High-Purity Ethylene by Gas Chromatography

D3246 Test Method for Sulfur in Petroleum Gas by Oxidative Microcoulometry

D4178 Practice for Calibrating Moisture Analyzers

D4468 Test Method for Total Sulfur in Gaseous Fuels by Hydrogenolysis and Rateometric Colorimetry

F307 Practice for Sampling Pressurized Gas for Gas Analysis

3. Terminology

3.1 *Definitions:*

3.1.1 *ethylene product, n*—hydrocarbon product containing at least 99.85 % mass ethylene.

3.2 *Symbols:*

3.2.1 *C4s, n*—saturated and unsaturated four carbon hydrocarbon compounds.

3.2.2 *COS, n*—carbonyl sulfide.

3.2.3 *GC, n*—gas chromatograph.

3.2.4 *FPD, n*—flame photometric detector.

3.2.5 *IC, n*—ion chromatograph.

3.2.6 *MeOH, n*—methanol.

3.2.7 *NO, n*—nitric oxide.

3.2.8 NO_2, *n*—nitrogen dioxide.

3.2.9 O_2, *n*—oxygen.

3.2.10 *sp. ion electrode, n*—specific ion electrode.

4. Significance and Use

4.1 When the various producers and users of ethylene product deal with the results obtained in analytical testing, inconsistency of units and test methods may cause major errors. This guide provides an overview of the typical concentrations of the possible components found in ethylene product, the methods used in analysis, and the units of measure. This overview is intended to be used to improve the consistency of methods and the units reported so that errors are minimized. Each producer and user of ethylene product should immediately review this guide to improve their awareness of the various analytical methods in use, the units of measure, and concentration levels of the possible components.

4.2 Although this guide is not to be used for specifications, it can provide a starting point for the various parties to develop mutually agreed upon specifications that meet their respective requirements. It can also be used as a starting point in finding suitable test methods for ethylene components.

5. Sampling

5.1 In general, sample ethylene product using Practice F307, or a similar method. Do not take liquid ethylene samples in order to prevent over-pressuring of sample containers and elimination of fire and explosion hazards. Static electricity can develop when discharging excess hydrocarbon at a fairly rapid

[1] This guide is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.D0.02 on Ethylene.

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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.