



Designation: D6209 – 21

Standard Test Method for Determination of Gaseous and Particulate Polycyclic Aromatic Hydrocarbons in Ambient Air (Collection on Sorbent-Backed Filters with Gas Chromatographic/Mass Spectrometric Analysis)¹

This standard is issued under the fixed designation D6209; 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 method² specifies sampling, cleanup, and analysis procedures for the determination of polycyclic aromatic hydrocarbons (PAH) in ambient air.

1.2 This test method is designed to collect both gas-phase and particulate-phase PAH and to determine them collectively.

1.3 This test method is a high-volume sampling (100 to 250 L/min) method capable of detecting PAH at sub-nanograms per cubic metre (ng/m^3) concentrations with sampling volumes up to 350 m^3 of air.

1.4 This test method has been validated for sampling periods up to 24 h.

1.5 Precision and bias under normal conditions can be expected to be ± 35 to 50 %.

1.6 This test method describes a sampling and analysis procedure for PAH that involves collection from air on a combination fine-particle filter and sorbent trap and subsequent analysis by gas chromatography/mass spectrometry (GC/MS).

1.7 The range of this test method is approximately 0.05 to $1000 \text{ ng}/\text{m}^3$ of air sampled.

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

1.9 *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 appro-*

priate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use. See also Section 8 for additional safety precautions.

1.10 *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:*³

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

D1357 Practice for Planning the Sampling of the Ambient Atmosphere

D3631 Test Methods for Measuring Surface Atmospheric Pressure

D4840 Guide for Sample Chain-of-Custody Procedures

E1 Specification for ASTM Liquid-in-Glass Thermometers

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology **D1356**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *sampling efficiency (SE), n*—ability of the sampler to trap and retain PAH; the percent SE is the percentage of the analyte of interest collected and retained by the sampling medium when it is introduced into the air sampler and the sampler is operated under normal conditions for a period of time equal to or greater than that required for the intended use.

3.2.2 *dynamic retention efficiency, n*—ability of the sampling medium to retain a given PAH that has been added to the

¹ This test method is under the jurisdiction of ASTM Committee **D22** on Air Quality and is the direct responsibility of Subcommittee **D22.03** on Ambient Atmospheres and Source Emissions.

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² This test method is based on U.S. Environmental Protection Agency Compendium Method TO-13A, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Report No. EPA/625/R-96/010b, January 1999, available from the National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161, Order No. PB90-11989/AS.

³ 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.