Designation: D 4861 – 00

Standard Practice for Sampling and Selection of Analytical Techniques for Pesticides and Polychlorinated Biphenyls in Air[1]

This standard is issued under the fixed designation D 4861; 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 practice covers the sampling of atmospheres for a variety of common pesticides and polychlorinated biphenyls (PCBs) and provides guidance on the selection of appropriate analytical measurement methods.

1.2 A complete listing of pesticides and other semivolatile organic chemicals for which this practice has been tested is shown in Table 1.

1.3 This practice is based on the adsorption of chemicals from air on polyurethane foam (PUF) or a combination of PUF and granular sorbent.

1.4 This practice is applicable to multicomponent atmospheres, 0.001 to 50-µg/m^3 concentrations, and 4 to 24-h sampling periods. The limit of detection will depend on the nature of the analyte and the length of the sampling period.

1.5 The analytical method(s) recommended will depend on the specific chemical(s) sought, the concentration level, and the degree of specificity required.

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.* For specific hazards statements, see 10.24 and A1.1.

2. Referenced Documents

2.1 *ASTM Standards:*

D 1193 Specification for Reagent Water[2]

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres[3]

D 3686 Practice for Sampling Atmospheres to Collect Organic Compound Vapors (Activated Charcoal Tube Adsorption Method)[3]

D 3687 Practice for Analysis of Organic Compound Vapors Collected by the Activated Charcoal Tube Adsorption Method[3]

D 4185 Practice for Measurement of Metals in Workplace Atmosphere by Atomic Absorption Spectrophotometry[3]

E 355 Practice for Gas Chromatography Terms and Relationships[4]

2.2 *EPA Methods:*[5]

EPA 600/4-89-017 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air

EPA 600/R-96/010b Compendium of Methods for the Determination to Toxic Organic Compounds in Ambient Air

EPA 821/C-97-001 Methods and Guidance for Analysis of Water

EPA SW-846 Test Methods for Evaluating Solid Waste Physical Chemical Methods

2.3 *Government Standard:*[5]

40 CFR 136 EPA Organic Chemical Analysis of Municipal and Industrial Wastewater

3. Terminology

3.1 *Definitions*—Refer to Terminology D 1356 and Practice E 355 for definitions of terms used in this practice.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *dynamic retention efficiency*—ability of the sampling medium to retain the solution spike when air or nitrogen is drawn through the sampling cartridge under normal operating conditions and for the duration of the test period. The dynamic RE is normally equal to or less than the SE.

3.2.2 *relative retention time, (*RRT)—ratio of RTs for two chemicals for the same chromatographic column and carrier gas flow rate, where the denominator represents a reference chemical.

3.2.3 *retention efficiency, (*RE)—ability of the sampling medium to retain a compound added (spiked) to it in liquid solution.

3.2.4 *retention time, (*RT)—time to elute a specific chemical from a chromatographic column, for a specific carrier gas flow rate, measured from the time the chemical is injected into the gas stream until it appears at the detector.

3.2.5 *sampling efficiency, (*SE)—ability of the sampling medium to trap vapors of interest. The percentage of the

[1] This practice is under the jurisdiction of ASTM Committee D22 on Sampling and Analysis of Atmospheres and is the direct responsibility of Subcommittee D22.05 on Indoor Air.

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[2] *Annual Book of ASTM Standards*, Vol 11.01.

[3] *Annual Book of ASTM Standards*, Vol 11.03.

[4] *Annual Book of ASTM Standards*, Vol 14.02.

[5] Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

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