



Designation: D4790 – 11

## Standard Terminology of Aromatic Hydrocarbons and Related Chemicals<sup>1</sup>

This standard is issued under the fixed designation D4790; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Referenced Documents

#### 1.1 ASTM Standards:<sup>2</sup>

- D835** Specification for Refined Benzene-485 (Withdrawn 1997)<sup>3</sup>
- D841** Specification for Nitration Grade Toluene
- D843** Specification for Nitration Grade Xylene
- D846** Specification for Ten-Degree Xylene (Withdrawn 1989)<sup>3</sup>
- D847** Test Method for Acidity of Benzene, Toluene, Xylenes, Solvent Naphthas, and Similar Industrial Aromatic Hydrocarbons
- D848** Test Method for Acid Wash Color of Industrial Aromatic Hydrocarbons
- D1015** Test Method for Freezing Points of High-Purity Hydrocarbons
- D1016** Test Method for Purity of Hydrocarbons from Freezing Points
- D1129** Terminology Relating to Water
- D1298** Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- D1492** Test Method for Bromine Index of Aromatic Hydrocarbons by Coulometric Titration
- D1840** Test Method for Naphthalene Hydrocarbons in Aviation Turbine Fuels by Ultraviolet Spectrophotometry
- D2031** Test Method for Reducing Substances in Refined Pyridine (Withdrawn 2003)<sup>3</sup>
- D2121** Test Methods for Polymer Content of Styrene Monomer and AMS ( $\alpha$ -Methylstyrene)
- D2147** Method of Test for Detection and Estimation of Water-Insoluble Impurities in Refined Phenol by Cloud

- Point Depression** (Withdrawn 1979)<sup>3</sup>
- D2269** Test Method for Evaluation of White Mineral Oils by Ultraviolet Absorption
- D2279** Method of Test for Acid Wash Color of Refined Naphthalene (Withdrawn 1982)<sup>3</sup>
- D2323** Specification for Refined Pyridine (1 Degree) (Withdrawn 2003)<sup>3</sup>
- D2359** Specification for Refined Benzene-535
- D2403** Specification for Refined Phthalic Anhydride-1308 (Withdrawn 2008)<sup>3</sup>
- D2777** Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water
- D2827** Specification for Styrene Monomer
- D2935** Test Method for Apparent Density of Industrial Aromatic Hydrocarbons (Withdrawn 2005)<sup>3</sup>
- D3980** Practice for Interlaboratory Testing of Paint and Related Materials (Withdrawn 1998)<sup>3</sup>
- D4053** Test Method for Benzene in Motor and Aviation Gasoline by Infrared Spectroscopy
- D4734** Specification for Refined Benzene-545
- E12** Terminology Relating to Density and Specific Gravity of Solids, Liquids, and Gases (Withdrawn 1996)<sup>3</sup>

### 2. Terminology

**absorbance**,  $n$ —the logarithm to the base 10 of the reciprocal of the relative transmittance,  $T$ , expressed as:

$$A = \log_{10}(1/T) = -\log_{10} T \quad (1)$$

**D1840, D2269, D4053; D02**

**accuracy**,  $n$ —the agreement between the mean of a series of repeated measurements of a property and the accepted reference value of the property. **D3980; D01**

**acidity**,  $n$ —the number of milligrams of sodium hydroxide consumed when 100 mL of the sample are titrated under the conditions prescribed in this method. **D847; D16**

**acid reaction**,  $n$ —a characteristic of materials producing the acid-color of the indicator used under the conditions prescribed in this method. **D847; D16**

**acid wash color**,  $n$ —the color developed in the separated acid when a sample is agitated with sulfuric acid under the condition prescribed in this method. **D848; D2279; D16**

<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee D16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.05 on Editorial and Nomenclature.

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The boldface designations refer to the original source of the definition and the ASTM Technical Committee having jurisdiction.

<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

**aldehydes**, *n*—a broad class of organic compounds having a generic formula RCHO, and characterized by a carbonyl group.

**alkaline or basic reaction**, *n*—a characteristic of the materials producing the alkalicolor of the indicator used under the conditions prescribed in this method. **D847; D16**

**alpha-methylstyrene**, *n*—2-phenylpropene (C<sub>9</sub>H<sub>10</sub>) mol weight 119.16; colorless liquid; subject to polymerization by heat or catalysts; freezing point, -23.21°C; boiling point, 165.38°C.

**apparent density**, *n*—the density calculated when the pycnometer is calibrated with water, weighed in air, and when the sample is weighed in air and no air buoyancy correction is used for either weighing, even though the density in vacuum of water is used in calculating the apparent volume of the pycnometer.

**apparent density at 60°F**, *n*—the weight in air of a unit volume of sample at 60°F; in this method, the weight is in pounds and the volume in U.S. liquid gallons. Average air in this method is assumed to have a density of 0.0012 g/cm<sup>3</sup>.

DISCUSSION—This definition is not in conflict with that given in the current version of Definitions E12. **D2935; D16**

**aromatic hydrocarbon**, *n*—an organic chemical containing a benzene ring. Committee D16 scope includes monocyclic and polycyclic carbon-ring structures recovered or synthesized from any source, and which are intended primarily for use as solvents or raw materials for chemical synthesis.

**aromatic hydrocarbon derivatives and related chemicals**, *n*—Committee D16 scope includes chemicals such as: cycloalkanes such as cyclohexane which are intended primarily for use in chemical synthesis; phenols, arylthiols, and their homologs; heterocyclics such as pyridine and quinoline; and other chemicals synthesized from ring structures. Excluded from the scope are paraffinic and olefinic hydrocarbons, and those aromatic and cyclic aliphatic hydrocarbons that are intended primarily for fuels and lubricants.

**at-line analysis**, *n*—analytical procedure performed in a process environment using manually entered samples.

**benzene**, *n*—cyclohexatriene, benzol (obsolete) (C<sub>6</sub>H<sub>6</sub>) mol weight 78.11; clear, colorless, highly flammable liquid; characteristic odor; solidification point +5.5°C; boiling point 80.1°C.

**benzene, carbon disulfide-free**, *n*—benzene treated with alcoholic sodium hydroxide and used as a spectrophotometric reference standard.

**benzene-535, refined**, *n*—benzene with impurities limited to trace amounts by a solidification point of 5.35°C and having a total distillation range of no more than 1.0°C. Refer to Specification D2359 for complete specifications.

**benzene-545, refined**, *n*—benzene with impurities limited to trace amounts by a solidification point of 5.45°C and having

a total distillation range of no more than 1°C. Refer to Specification D4734.

**benzene-485, refined (nitration grade)**, *n*—benzene with impurities limited by a solidification point of 4.85°C and having a total distillation range of no more than 1.0°C. Refer to Specification D835 for complete specifications.

**benzene, thiophene-free**, *n*—benzene refined by special treatment and used as a reagent in ASTM standards.

**bias**, *n*—a persistent positive or negative deviation of a test method average value from the assumed or accepted true value. **D1129; D2777; D19**

**bromine index**, *n*—the number of milligrams of bromine consumed by 100 g of sample under given conditions. **D1492; D16**

**carbon disulfide (CS<sub>2</sub>)**, *n*—mol weight 76.14; clear, colorless, flammable, volatile liquid; boiling point, 45.6°C; freezing point, 111.6°C.

**clear**, *n*—free of turbidity.

**cloud point of phenol**, *n*—the temperature at which a separate phase forms when a homogeneous solution of phenol in water is allowed to cool at a prescribed rate from a temperature above that at which phase separation occurs. It may precisely be defined as follows: when a homogeneous solution of phenol and water is allowed to cool at a prescribed rate with stirring, the solution will show a slight cloudiness or turbidity as the cloud point is approached. On further cooling, the cloudiness will increase rapidly and the thermometer bulb, which is centrally located in the test tube, will suddenly become invisible. The temperature at which the thermometer bulb becomes invisible is taken as the cloud point. **D2147; D16**

**cloudy**, *n*—qualitative expression of turbidity.

**confidence limits**, *n*—the limits on either side of the mean value of a group of observations which will, in a stated fraction or percent of the cases include the expected value. Thus the 95 % confidence limits are the values between which the population mean will be situated in 95 out of 100 cases. **D3980; D01**

**copper corrosion**, *n*—a qualitative indication of reactive impurities in aromatic hydrocarbons. An iridescent, gray, or black discoloration of polished copper strip is considered cause for rejection.

**corrosive substance**, *n*—in Committee D16 Standards, material in industrial aromatic hydrocarbons that discolors or tarnishes polished copper.

**cresol(s)**, *n*—methyl phenol, hydroxymethyl benzene (C<sub>7</sub>H<sub>8</sub>O) mol weight 108.13; colorless, yellowish, brownish, yellow, or pinkish liquid; phenolic odor. Three isomeric cresols exist.

**cresylic acids**, *n*—commercial mixtures of phenolic materials which may include phenol, cresols, xylenols, and other alkylated phenols.