Designation: D 5029 – 98 (Reapproved 2004)

Standard Test Method for Water Solubles in Activated Carbon[1]

This standard is issued under the fixed designation D 5029; 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 water soluble content of (unused) granular and powdered activated carbons. Water solubles are materials that can be extracted by distilled water under reflux conditions and are expressed as a percentage of dry carbon weight.

1.2 *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]

D 1193 Specification for Reagent Water
D 2652 Terminology Relating to Activated Carbon
D 2867 Test Method for Moisture in Activated Carbon
D 3838 Test Method for pH of Activated Carbon
E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
E 300 Practice for Sampling Industrial Chemicals

3. Terminology

3.1 *Definitions*—Terms relating to this standard are defined in Terminology D 2652.

4. Summary of Test Method

4.1 A known weight of activated carbon is placed into a reflux apparatus with Type II reagent water (see Specification D 1193). The mixture is refluxed for 15 min under specified conditions. This extraction is performed using the method and apparatus described in Test Method D 3838. After extraction, the carbon is separated by filtration and an aliquot of the filtrate is evaporated to dryness. Water solubles are determined by weighing the dry residue and expressing the result as a percentage of the dry carbon weight.

5. Significance and Use

5.1 In certain applications, the ash, color, conductivity, or pH of the finished activated carbon product may be influenced by the quantity of water solubles it contains. This water solubles test provides a relative indication of the quantity of soluble materials that may be extracted from various activated carbons.

6. Apparatus and Materials

NOTE 1—All volumetric measuring equipment should meet or exceed the requirements of National Institute of Standards and Technology Circular 602, *Testing of Glass Volumetric Apparatus*, available from the National Institute of Standards and Technology, Gaithersburg, MD 20899. Volumetric glassware meeting these specifications is generally designated as Class A.

6.1 *Flask*, 250 mL with 24/40 ST (standard taper) neck.
6.2 *Condenser*, with 24/40 inner ST (standard taper) joint.
6.3 *Buchner Funnel*, 9 or 12.5 cm.
6.4 *Filter Paper, Ashless*, (~5 to 10 µm particle retention).
6.5 *Glass or Porcelain Evaporating Dishes*, 100 mL capacity.
6.6 *Analytical Balance*, precision 0.1 mg.
6.7 *Drying Oven*.
6.8 *Desiccator*.
6.9 *Hot Plate*.
6.10 *Pipet*, 50 mL.
6.11 *Indicating Desiccant*.
6.12 *Water*, ASTM Type II or better, in accordance with Specification D 1193, Type II.
6.13 *Thermometer*, approximately 20 to 55°C.
6.14 *Steam Bath*, optional.
6.15 *Beakers*, 250 mL.
6.16 *Graduated Cylinder*, 100 mL.
6.17 *Laboratory Timer*.
6.18 *Filter Flasks*, vacuum, 500 mL.

7. Sampling

7.1 Conducted sampling according to Practice E 300.

[1] This test method is under the jurisdiction of ASTM Committee D28 on Activated Carbon and is the direct responsibility of Subcommittee D28.02 on Liquid Phase Evaluation.

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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.