Designation: D6851 – 02 (Reapproved 2011)

Standard Test Method for Determination of Contact pH with Activated Carbon [1]

This standard is issued under the fixed designation D6851; 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 method is to be used in the determination of the pH of water on initial contact with activated carbon. This test method is not meant as a replacement for Test Method D3838 and may give a different value.

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 to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1193 Specification for Reagent Water
D1293 Test Methods for pH of Water
D3838 Test Method for pH of Activated Carbon
E300 Practice for Sampling Industrial Chemicals

3. Summary of Test Method

3.1 A sample of carbon is stirred with water and the pH of the suspension is measured.

4. Significance and Use

4.1 The determination of contact pH can be used as a simple and fast measurement that can allow activated carbon producers and users to have a standard method for assessing the effect various carbons will have on the initial pH of the water in contact with the carbon. It has been determined that there is a bias between this method and Test Method D3838; they are not equivalent.

5. Interferences

5.1 pH electrodes used to measure this quantity can eventually become clogged over time with carbon fines. Suitable electrodes can be found which have a detachable junction allowing the user when necessary to discard a fouled pH membrane.

5.2 Distilled water can become acidic on standing. Make sure that the water used meets the minimum requirements for ASTM Type II water. Determine the pH as indicated in Test Method D1293.

6. Apparatus

6.1 A pH meter (ambient temperature of 25 °C is assumed; if otherwise, temperature compensation is required for accurate pH measurement.

6.2 A combination pH electrode, or glass-calomel electrodes used together.

6.3 A100 mL (TD) graduated cylinder

6.4 A250 mL glass beaker (for each sample)

6.5 A polymer-coated magnetic stir bar (for each sample)

6.6 Magnetic stir plate

6.7 A balance capable of accurately measuring to 0.1 g

7. Reagents and Materials

7.1 Distilled or de-ionized water that meets the ASTM Type II requirements

7.2 Buffers to calibrate the pH meter; typically pH 4.0, pH 7.0, and/or pH 10.0

8. Hazards

8.1 The water in contact with the carbon may have either a low or high pH. Take precautions accordingly and wear necessary protective equipment to prevent injuries from spills and splashes.

9. Sampling, Test Specimens, and Test Units

9.1 Follow Practice E300 in the collection and preparation of samples.

10. Preparation of Apparatus

10.1 Use the procedure of Test Methods D1293 to standardize the pH meter before measurement.

11. Calibration and Standardization

11.1 See above section.

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

Current edition approved Sept. 1, 2011. Published November 2011. Originally approved in 2002. Last previous edition approved in 2007 as D6851 – 02 (2007). DOI: 10.1520/D6851-02R11.

[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.

12. Conditioning

12.1 The sample should be tested as received.

13. Procedure

13.1 A representative sample should be taken from the quantity to be tested and prepared for testing (as received).

13.2 Ten (10) grams of sample (as received) will be used for the test. Place 10 g of a representative sample into a 250 mL beaker.

13.3 The pH of the water to be used should be determined and recorded before use.

13.4 Using a graduated cylinder, measure and add 100 mL of water to the ten gram sample in the beaker.

13.5 Add one stir bar and stir for ten minutes with sufficient turbulence to fluidize the sample in the beaker. (**Warning**—too vigorous stirring should be avoided as this may introduce air into the sample affecting pH.)

13.6 Stop stirring, and without delay or filtering, measure the pH of the suspension.

14. Calculation or Interpretation of Results

14.1 No calculations are necessary if the meter results are already temperature corrected.

15. Report

15.1 Report the value from step 13.6 as the contact pH.

16. Precision and Bias

16.1 Based on limited information from one laboratory with one sample tested in triplicate, the repeatability standard deviations and the 95 % repeatability limits are:

Contact pH (avg. of 3)	Standard Deviation	95 % Confidence Limits
8.5	0.2	±2.35 %

16.2 The interlaboratory bias of this method has not been quantitatively determined, but it has been observed that it is not equivalent to Test Method D3838 and should not be confused with, or meant to replace that method.

17. Keywords

17.1 activated carbon; contact; pH