



ANSI/ASTM D 2355 - 70 (Reapproved 1976)

Standard Recommended Practice for LIQUID PHASE EVALUATION OF ACTIVATED CARBON¹

This Standard is issued under the fixed designation D 2355; 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.

1. Scope

1.1 This recommended practice is a general procedure for the evaluation of a test activated carbon versus a reference activated carbon by the adsorption isotherm technique. It is intended to provide a common basis for developing evaluation procedures for activated carbon in liquid phase applications. The basic procedure, called the Adsorbate Relative Efficiency Test, has as its objective the determination of how much test carbon is required to remove a stated percentage (Note) of the impurity from an appropriate quantity of a standard test solution as compared to the amount of a reference carbon required to achieve the same degree of purification.

NOTE—The example cited in Sections 7 and 8 is based on 90 percent removal of impurity.

1.2 If the weight of a reference carbon is M_r and the weight of test carbon is M_t , then the relative efficiency RE, of the test carbon is as follows:

$$RE = (M_r/M_t) \times 100$$

1.3 The procedure to be described applies to either powdered or granular activated carbon. This test applies in practice only when the same degree of equilibrium is obtained in the test as in practice. When granular carbon is to be tested by this procedure, a sufficiently long contact time should be allowed to reach equilibrium. Alternatively, the granular carbon may be pulverized so that all of it passes through a No. 325 (44- μ m) sieve in order to shorten the required contact time to reach equilibrium.

2. Test Solution

2.1 The test solution shall be a standard

solution appropriate to the industry in which the carbon is to be used, if and when a specific industry has established a standard test solution; otherwise, the test solution shall be representative of the process stream. Both the concentrations of the impurity and solute and the pH value of the test solution should be standardized.

2.2 An appropriate aliquot quantity of said test solution shall be used to obtain two four-point adsorption isotherms and for two blanks.

3. Apparatus

3.1 The apparatus required for carrying out this procedure shall be compatible with the operating conditions existing in each specific industry.

4. Activated Carbon Dosage

4.1 Weigh the carbons on an "as is" basis to the nearest 1 mg. Determine the moisture; the final results can then be expressed both on an "as is" basis and on a dry basis.

4.2 The weights of a reference carbon must be fixed for each given test solution by predetermining what dosages are required to obtain an adsorption isotherm over the desired purification range.

4.3 The weights of the test carbon must be estimated, since its relative efficiency (RE) is not known. For the present example, it will be assumed that the test carbon is 150 RE and therefore lower dosages will be required to

¹ This recommended practice is under the jurisdiction of ASTM Committee D-28 on Activated Carbon.

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