



# Standard Test Method for Estimating the Organic Fouling of Particulate Anion Exchange Resins<sup>1</sup>

This standard is issued under the fixed designation D 5042; 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.

<sup>e1</sup> NOTE—Warning statements were editorially moved into the text in June 2004.

## 1. Scope

1.1 This test method provides a general estimate of the organic fouling of an anion exchange resin based upon total organic carbon measurements.

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.* For a specific hazard statement, see 8.3.

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

D 1129 Terminology Relating to Water

D 1193 Specification for Reagent Water

D 2187 Test Methods for Physical and Chemical Properties of Particulate Ion Exchange Resins

D 2579 Test Methods for Total Organic Carbon in Water<sup>3</sup>

D 2687 Practices for Sampling Particulate Ion-Exchange Materials

D 4839 Test Method for Total Carbon and Organic Carbon in Water by Ultraviolet, or Persulfate Oxidation, or Both, and Infrared Detection

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology D 1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *organic fouling*—buildup of organic material in or on anion exchange resins by sorption during the service cycle and incomplete removal during regeneration.

## 4. Summary of Test Method

4.1 A sample of particulate anion exchange material is contacted with a sodium chloride/sodium hydroxide solution at an elevated temperature. After a specified contact time, the concentration of organic material in the aqueous phase is measured as total organic carbon<sup>4</sup> (TOC).

## 5. Significance and Use

5.1 One of the major factors in the unsatisfactory performance of anion exchange resins is their fouling by organic material. Knowledge of the degree of fouling can be used to assess the condition of the resin and may indicate the need for pretreatment of the influent, remedial cleaning procedures, or resin replacement.

5.2 It is recognized that this test method may not remove and detect cation sloughage products or declumping agents. It is not intended to remove all organic compounds from the resin.

5.3 Since the chemical structures of organics compounds fouling the resin are generally unknown and are expressed only on the basis of their carbon content, interpretation of test results to form a basis for predictions for resin performance or cleaning procedures should be approached with caution.

5.4 Samples may be taken before or after plant regeneration, or both, depending on the type of information desired. This decision is left to the judgment of the user.

## 6. Interferences

6.1 The high sodium chloride (NaCl) concentration of the test solutions may interfere with the response of the total

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.08 on Membrane and Ion Exchange Materials.

Current edition approved June 1, 2004. Published June 2004. Originally approved in 1990. Last previous edition approved in 1998 as D 5042 – 90 (1998).

<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> Withdrawn

<sup>4</sup> Fisher, S., and Otten, G., "Standardization of Methodology for Estimating the Organic Fouling of Ion Exchange Resins," *Proceedings of the International Water Conference*, October 1989.