



Designation: D5806 – 95 (Reapproved 2017)

Standard Test Method for Disinfectant Quaternary Ammonium Salts by Potentiometric Titration¹

This standard is issued under the fixed designation D5806; 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 a potentiometric titration procedure for determining active matter in disinfectant quaternary ammonium salts. This test method is intended for the analysis of quaternary ammonium salts used as disinfectants, and only applies to the following commonly used quaternary ammonium salts: *n*-alkyldimethylbenzylammonium chloride (see Fig. 1), cetyltrimethylammonium chloride, and a blend of *n*-octyldecyl dimethylammonium chloride, di-*n*-octyl dimethylammonium chloride, and di-*n*-decyldimethyl ammonium chloride (see Fig. 2). Also, this test method can be applied to the analysis of disinfectant type products where the formula ingredients are known and the quaternary ammonium salt is one of the above. Interferences such as amines oxides and betaines present in disinfectant formulations were not tested.

1.2 This disinfectant quaternary ammonium salt conforms to the structures in Fig. 1 and Fig. 2.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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 specific precautionary information, see Section 8.

2. Referenced Documents

2.1 *ASTM Standards*:²

D459 Terminology Relating to Soaps and Other Detergents

D1193 Specification for Reagent Water

D1681 Test Method for Synthetic Anionic Active Ingredient in Detergents by Cationic Titration Procedure

D3049 Test Method for Synthetic Anionic Ingredient by Cationic Titration

E180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

3. Terminology

3.1 *Definitions*—See Terminology D459.

4. Summary of Test Method

4.1 Disinfectant type quaternary ammonium compounds present, as the active materials in disinfectant type products are titrated potentiometrically in an aqueous medium with a standard solution of sodium lauryl sulphate using a nitrate ion-selective electrode or a surfactant electrode (see also Test Method D1681). In this potentiometric titration, the reaction involves the formation of a complex between the disinfectant quaternary ammonium compound and the anionic surfactant which then precipitates. At the end point, the nitrate ion electrode or surfactant electrode appears to respond to an excess of titrant with a potential change large enough to give a well defined inflection in the titration curve.

5. Significance and Use

5.1 This test method is used to determine the percent actives in each type of the disinfectant quaternary ammonium salts,

¹ This test method is under the jurisdiction of ASTM Committee D12 on Soaps and Other Detergents and is the direct responsibility of Subcommittee D12.12 on Analysis and Specifications of Soaps, Synthetics, Detergents and their Components.

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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.

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