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Standard Test Method for Acidity in Aviation Turbine Fuel[1]

This standard is issued under the fixed designation D3242; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method covers the determination of the acidity in aviation turbine fuel in the range from 0.000 to 0.100 mg KOH/g.

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

1.3 *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]

D664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration

D1193 Specification for Reagent Water

3. Terminology

3.1 *Definitions:*

3.1.1 *acid number, n*—the quantity of a specified base, expressed in milligrams of potassium hydroxide per gram of sample, required to titrate a sample in a specified solvent to a specified endpoint using a specified detection system.

3.1.1.1 *Discussion—in this test method*, the solvent is a toluene-water-isopropanol mixture and the end point is determined when a green/green brown color is obtained using the specified *p*-naphtholbenzein indicator solution.

4. Summary of Test Method

4.1 The sample is dissolved in a mixture of toluene and isopropyl alcohol containing a small amount of water. The resulting single phase solution is blanketed by a stream of nitrogen bubbling through it and is titrated with standard alcoholic potassium hydroxide to the end point indicated by the color change (orange in acid and green in base) of the added *p*-naphtholbenzein solution.

5. Significance and Use

5.1 Some acids can be present in aviation turbine fuels due either to the acid treatment during the refining process or to naturally occurring organic acids. Significant acid contamination is not likely to be present because of the many check tests made during the various stages of refining. However, trace amounts of acid can be present and are undesirable because of the consequent tendencies of the fuel to corrode metals that it contacts or to impair the water separation characteristics of the aviation turbine fuel.

5.2 This test method is designed to measure the levels of acidity that can be present in aviation turbine fuel and is not suitable for determining significant acid contamination.

6. Apparatus

6.1 *Buret*—A 25-mL buret graduated in 0.1-mL subdivisions, or a 10-mL buret graduated in 0.05-mL subdivisions.

NOTE 1—An automated buret capable of delivering titrant amounts in 0.05 mL or smaller increments can be used, but the stated precision data were obtained using manual burets only.

7. Reagents and Materials

7.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society,

[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.06 on Analysis of Liquid Fuels and Lubricants.

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This test method has been approved by the sponsoring committees and accepted by the cooperating societies in accordance with established procedures.

[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.

***A Summary of Changes section appears at the end of this standard**

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