Designation: D1093 – 04 (Reapproved 2007)

Standard Test Method for Acidity of Hydrocarbon Liquids and Their Distillation Residues[1]

This standard is issued under the fixed designation D1093; 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 Department of Defense.

1. Scope

1.1 This test method covers the qualitative determination of the acidity of hydrocarbon liquids and their distillation residues. (**Warning**—Many hydrocarbon liquids are extremely flammable. Harmful if inhaled. Hydrocarbon liquid vapors can cause a flash fire.)

1.2 If desired to determine the basicity of a hydrocarbon liquid, proceed in accordance with 9.2 or 9.3, but substitute 3 drops of phenolphthalein indicator solution for the methyl orange indicator. A pink or red color in the aqueous solution when phenolphthalein is used indicates basicity.

1.3 The results obtained by this method are qualitative expressions. However, for the preparation of reagents and in the procedure, acceptable SI units are to be regarded as the standard.

1.4 *This standard does not purport to address all of the safety problems, 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]

D86 Test Method for Distillation of Petroleum Products at Atmospheric Pressure

D91 Test Method for Precipitation Number of Lubricating Oils

D850 Test Method for Distillation of Industrial Aromatic Hydrocarbons and Related Materials

D1078 Test Method for Distillation Range of Volatile Organic Liquids

D1193 Specification for Reagent Water

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products

3. Terminology

3.1 *Definitions:*

3.1.1 *acidity*, *n*—the quality, state or degree of being acid.

3.1.1.1 *Discussion*—In this test method, the criterion for acidity is a pink or red color when methyl orange indicator is used.

3.1.2 *basicity*, *n*—the quality, state or degree of being basic.

3.1.2.1 *Discussion*—In this test method, the criterion for basicity is a pink or red color when phenolphthalein indicator is used.

3.1.3 *distillation residue*, *n*—that portion of the sample remaining after distillation using specified procedures.

4. Summary of Test Method

4.1 The sample of distillation residue or hydrocarbon liquid is shaken with water and the aqueous layer tested for acidity to methyl orange indicator.

4.2 The aqueous layer can also be tested for basicity using phenolphthalein indicator.

5. Significance and Use

5.1 Some petroleum products are treated with mineral acid as part of the refining procedure. Obviously, any residual mineral acid in a petroleum product is undesirable. The absence of a positive indication in the test for acidity of the distillation residue or aqueous extract of a hydrocarbon liquid is an assurance of the care used in refining the fuel or solvent.

6. Apparatus

6.1 *Centrifuge Tube*, cone-shaped, 100-mL capacity; calibration not necessary.

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

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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.