



Designation: D8045 – 17<sup>ε1</sup>

## Standard Test Method for Acid Number of Crude Oils and Petroleum Products by Catalytic Thermometric Titration<sup>1</sup>

This standard is issued under the fixed designation D8045; 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>ε1</sup> NOTE—Subsections 16.1.1 and 16.1.2 were corrected editorially in July 2018.

---

### 1. Scope\*

1.1 This test method covers the determination of acidic components in crude oil and petroleum products including waxes, bitumen, base stocks, and asphalts that are soluble in mixtures of xylenes and propan-2-ol. It is applicable for the determination of acids whose dissociation constants in water are larger than  $10^{-9}$ ; extremely weak acids whose dissociation constants are smaller than  $10^{-9}$  do not interfere. The values obtained by this test method may not be numerically equivalent to other acid value measurements. The range of KOH acid numbers included in the precision statement is 0.1 mg/g to 16 mg/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, health, and environmental practices and determine the applicability of regulatory limitations prior to use. Some specific hazards statements are given in Section 7 on Safety Precautions.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

---

<sup>1</sup> 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.

Current edition approved July 1, 2017. Published July 2017. Originally approved in 2016. Last previous edition approved in 2016 as D8045 – 16<sup>ε1</sup>. DOI: 10.1520/D8045-17E01.

### 2. Referenced Documents

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

- D664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration
- D974 Test Method for Acid and Base Number by Color-Indicator Titration
- D1193 Specification for Reagent Water
- D4057 Practice for Manual Sampling of Petroleum and Petroleum Products
- D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
- D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products
- D5854 Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products
- D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance

### 3. Terminology

3.1 For general terminology, refer to Terminology D4175.

#### 3.2 Definitions:

3.2.1 *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.

3.2.2 *catalytic thermometric titration,  $n$* —a method to determine the end point of a chemical reaction through the use of a temperature measuring device and the addition of a chemical to enhance the detection of the endpoint.

3.2.3 *crude oil,  $n$* —a naturally occurring hydrocarbon mixture, generally in a liquid state, which may also include compounds of sulfur, nitrogen, oxygen, metals, and other elements.

---

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto: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