



ANSI/ASTM D 2785 - 80

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Standard Test Method for TRACE QUANTITIES OF TOTAL SULFUR (WICKBOLD AND BECKMAN COMBUSTION APPARATUS)¹

This standard is issued under the fixed designation D 2785; 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.

1. Scope

1.1 This method covers the determination of total sulfur primarily in the range from 2 to 25 ppm in volatile, normally liquid organic materials (Note 1). The method may be extended to liquid materials with higher sulfur concentration and to viscous liquids and solids by using appropriate solvents. Samples should not contain more than 100 ppm of halogens, 2 ppm of barium, or 0.1 ppm of lead or appreciable ash-forming substances.

NOTE 1—For the determination of total sulfur in liquefied petroleum gases see ASTM Method D 2784, Test for Sulfur in Liquefied Petroleum Gases (Oxy-Hydrogen Burner or Lamp).²

NOTE 2—To attain the quantitative detectability that the method is capable of, stringent techniques must be employed and all possible sources of sulfur contamination must be eliminated. In particular, cleaning agents, such as common household detergents which contain sulfates, should be avoided.

2. Applicable Documents

2.1 ASTM Standards:

- D 156 Test for Saybolt Color of Petroleum Products (Saybolt Chrometer Method)²
- D 270-API 2546 Sampling Petroleum and Petroleum Products²
- D 1266 Sulfur in Petroleum Products (Lamp Method)²
- D 2784 Sulfur in Liquefied Petroleum Gases (Oxy-Hydrogen Burner or Lamp)³
- E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁴

3. Summary of Method

3.1 The sample is burned in an oxy-hydrogen atomizer burner. The oxides of sulfur are absorbed and oxidized to sulfuric acid in a hydrogen peroxide solution. The sulfate ions

are determined then by either of the following finishes:

3.1.1 *Barium Perchlorate Titration*—The sulfate is titrated with barium perchlorate using a thorin-methylene blue mixed indicator.

3.1.2 *Turbidimetric*—The sulfate is precipitated as barium sulfate and the turbidity of a suspension of the precipitate is measured with a photometer.

4. Significance

4.1 It is important to have the sulfur content of light liquid petroleum products at low enough concentrations to meet any applicable government regulations. The presence of sulfur may result in corrosion of metal surfaces. Sulfur may be poisonous to catalysts in subsequent processing.

5. Apparatus

5.1 *Oxy-hydrogen Combustion Assembly*—The two types listed below are recommended. Any combustion apparatus giving equivalent results, however, is satisfactory.

5.1.1 *Wickbold-type Combustion Apparatus*,⁵ as shown in Fig. 1.

¹ This method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants.

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² Annual Book of ASTM Standards, Part 23.

³ Annual Book of ASTM Standards, Part 24.

⁴ Annual Book of ASTM Standards, Parts 14, 18, 26, 30, and 41.

⁵ Available from Fisher Scientific Co., Pittsburgh, Pa. 15219, with an all-stainless steel burner, or from Atlas Instrument Co., 8902 E. 11th St., Tulsa, Okla. For the latter, Hoke No. 993 combination flow meter-valve assemblies should be substituted for those supplied.