



Standard Test Method for Sulfur in Gasoline by Wavelength Dispersive X-Ray Fluorescence¹

This standard is issued under the fixed designation D6334; 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 the quantitative determination of total sulfur in gasoline and gasoline-oxygenate blends. The Pooled Limit of Quantitation (PLOQ) was determined to be 15 mg/kg. Therefore, the practical range for this test method is from 15 to 940 mg/kg.

NOTE 1—This concentration range is based on that used in the interlaboratory round robin, which shows that the range of sulfur in the round robin samples was from 1.5 to 940 mg/kg; however, below 15 mg/kg, the reproducibility approaches 100 % of the concentration.

1.2 *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 limitation prior to use.*

1.3 The values stated in SI units are to be regarded as the standard. The preferred units are mg/kg sulfur.

2. Referenced Documents

2.1 ASTM Standards:²

- D2622 Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry
- D3210 Test Method for Comparing Colors of Films from Water-Emulsion Floor Polishes
- D4045 Test Method for Sulfur in Petroleum Products by Hydrogenolysis and Rateometric Colorimetry
- D4057 Practice for Manual Sampling of Petroleum and Petroleum Products
- D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products
- D4294 Test Method for Sulfur in Petroleum and Petroleum Products by Energy Dispersive X-ray Fluorescence Spectrometry

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 D02.03 on Elemental Analysis.

Current edition approved Dec. 1, 2012. Published December 2012. Originally approved in 1962. Last previous edition approved in 2007 as D6334–07. DOI: 10.1520/D6334-12.

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.

- D5453 Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, and Engine Oil by Ultraviolet Fluorescence
- D5842 Practice for Sampling and Handling of Fuels for Volatility Measurement
- 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
- D6792 Practice for Quality System in Petroleum Products and Lubricants Testing Laboratories

3. Summary of Test Method

3.1 The sample is placed in the X-ray beam, and the intensity of the sulfur K α line at 5.373 Å is measured. The intensity of a corrected background, measured at a recommended wavelength of 5.190 Å, or if a rhodium tube is used, 5.437 Å, is subtracted from this intensity. The resultant net counting rate is then compared to a previously prepared calibration curve or equation to obtain the concentration of sulfur in mg/kg. (**Warning**—Exposure to excessive quantities of X radiation is injurious to health. Therefore, it is imperative that the operator avoid exposing any part of his or her person, not only to primary X-rays, but also to secondary or scattered radiation that might be present. The X-ray spectrometer should be operated in accordance with the regulations of recommendations governing the use of ionizing radiation.)

4. Significance and Use

4.1 Knowledge of the presence of sulfur in petroleum products, especially fuels, helps predict performance characteristics, potential corrosion problems, and vehicle emission levels. In addition, some regulatory agencies mandate reduced levels of sulfur in reformulated type gasolines.

5. Interferences

5.1 Fuels with compositions that vary from those specified in 9.1 may be analyzed with standards made from base materials that are of similar composition to minimize matrix effects.

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