



Designation: D2420 – 23

Standard Test Method for Hydrogen Sulfide in Liquefied Petroleum (LP) Gases (Lead Acetate Method)¹

This standard is issued under the fixed designation D2420; 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 method² covers the detection of hydrogen sulfide in liquefied petroleum (LP) gases. The sensitivity of the test is about 4 mg/m³ (0.15 to 0.2 grain of hydrogen sulfide per 100 ft³) of gas.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered 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.*

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.*

2. Referenced Documents

2.1 ASTM Standards:³

D1193 Specification for Reagent Water

D1265 Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method

D1835 Specification for Liquefied Petroleum (LP) Gases

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

2.2 GPA Standard:⁴

GPA 2140 Liquefied Petroleum Gas Specifications and Test Methods

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this test method, refer to Terminology D4175.

3.1.2 *liquefied petroleum gas (LP gas, LPG), n*—a narrow boiling range mixture of hydrocarbons consisting of propane, propylene, butanes and butylenes, individually or in specified combinations, with limited amounts of other hydrocarbons (such as ethane) and may contain naturally occurring, petroleum-derived, non-hydrocarbons.

4. Summary of Test Method

4.1 Vaporized LP gas is passed over moist lead acetate paper under controlled conditions. Hydrogen sulfide reacts with lead acetate to form lead sulfide which produces a coloration on the paper varying from yellow to black, depending upon the amount of hydrogen sulfide present.

5. Significance and Use

5.1 Liquefied petroleum gases and their products of combustion must not be unduly corrosive to the materials with which they come in contact. The potential personnel exposure hazards of H₂S also make the detection and measurement of hydrogen sulfide important, even in low concentrations. In addition, in some cases the odor of the gases shall not be objectionable. (See Specification D1835 and GPA 2140.)

6. Interferences

6.1 Methyl mercaptan, if present, produces a transitory yellow stain on the lead acetate paper that will fade completely in less than 5 min.

6.2 Other sulfur compounds present in liquefied petroleum gas do not interfere with the test.

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.H0 on Liquefied Petroleum Gas.

Current edition approved March 1, 2023. Published March 2023. Originally approved in 1965. Last previous edition approved in 2018 as D2420 – 13 (2018). DOI: 10.1520/D2420-23.

² This test method is based on Edwards, J. D., and McBride, R. S., “Lead Acetate Test for Hydrogen Sulphide in Gas,” *Technologic Papers T41*, National Institute for Standards and Technology, Aug. 9, 1914.

³ 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.

⁴ Available from Gas Processors Association (GPA), 66 American Plaza, Suite 700, Tulsa, OK 74135, <http://www.gpaglobal.org>.

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