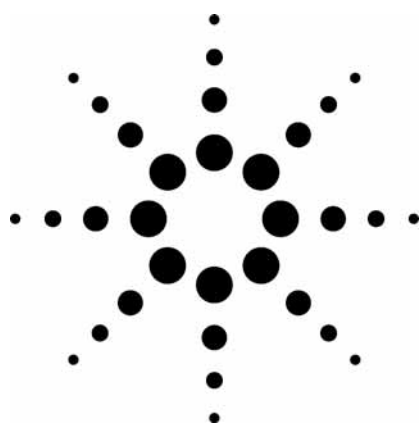


Agilent 355 Sulfur Chemiluminescence Detector (355 SCD): Odorants and Other Sulfur Compounds in Liquefied Petroleum and Natural Gases



• Technical Overview

Introduction

This technical overview briefly describes the analysis of liquefied petroleum gases as fully defined in ASTM D 5504-95. The method provides for the determination of individual volatile sulfur containing compounds, as well as the determination of total sulfur content in gaseous fuels, including natural gas.

Gas chromatography with sulfur chemiluminescence detection provides a rapid means to identify and quantify various sulfur compounds that may be present in petroleum feeds and products, such as liquefied petroleum gases (LPGs) and natural gas liquids (NGLs). These samples can contain many different amounts and types of sulfur compounds. Many sulfur compounds are corrosive to equipment, inhibit or destroy catalysts employed in downstream processing, and impart other undesirable properties to products. However, odorous sulfur compounds such as ethyl mercaptan, tetrahydrothiophene, and occasionally thiophane are intentionally added to propane as warning agents for detecting LPG leaks. The ability to speciate sulfur compounds in these liquids is useful for

quality assurance of odorant addition and for better control of the sulfur compounds in finished products. The following chromatogram illustrates the ability of the Agilent 355 Sulfur Chemiluminescence Detector (SCD) to speciate sulfur compounds in an NGL sample.

This particular NGL sample contained approximately 100 ppm wt total sulfur. The chromatographic conditions for the illustrated analysis were as follows: Agilent 5890 Series II gas chromatograph; Agilent 355 SCD operated according to standard conditions; and 30 m, 0.32 mm id, 4 μ m methyl silicone WCOT fused silica column. The temperature program was: -10° C for three minutes to the final required temperature at a rate of 10° C per minute.

Evolving column technology allows for the analysis of liquefied petroleum gases or natural gas liquids with separation of H_2S and COS at ambient temperatures using capillary columns such as the Chrompack CP Sil 5 CB (0.32 mm), Chrompack CP SilicaPLOT (30 m 0.32 mm id), or the Astec Gaspro (15 m 0.32 mm id).



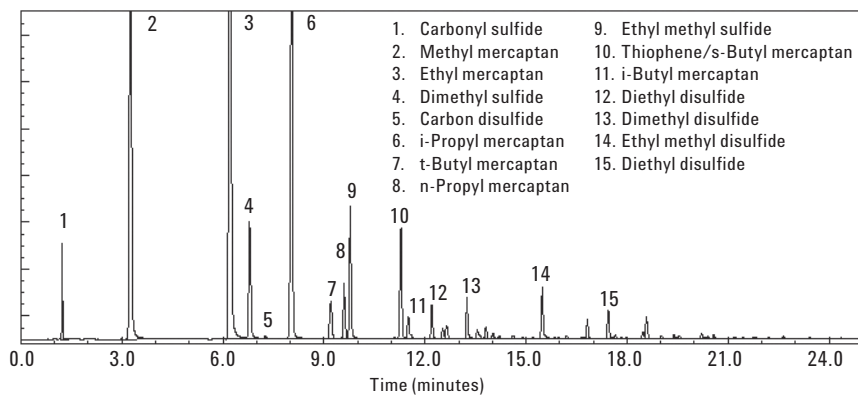


Figure 1. Sulfur compounds in natural gas liquids.

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