Varian 490-GC

MERCAPTANS IN GAS ANALYZER

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The Varian 490-GC Mercaptans in Gas Analyzer equipped with the micro-machined Differential Mobility Detector (μ -DMD) provides fast, precise monitoring of mercaptans in hydrocarbon streams, with the option of selecting other targeted sulfur components as well. Naturally occurring, mercaptans are strong-smelling, sulfur-based compounds that can be extremely corrosive and toxic, thereby impacting industrial process performance and the environment. Efforts are underway to significantly reduce sulfur emissions from fuels.

Key Benefits

- High sensitivity and unique selectivity. Offering extremely high sensitivity and unique selectivity, the Mercaptans in Gas Analyzer monitors mercaptan and other selected sulfur components in hydrocarbon streams precisely and quickly. It measures the desired levels of these components with no matrix interference so you can be confident of the quality of your results.
- Dual-detector technology. The analyzer features the flexibility and versatility of complementary dualdetector technology, a universal Thermal Conductivity Detector (μ-TCD) and a highly sensitive Differential Mobility Detector (μ-DMD) used in series, providing a comprehensive analysis of your sample.
- Electronic Gas Control. EGC ensures high reproducibility and the use of capillary column technology guarantees high separation efficiency.
- Turnkey solution. To ensure fast, accurate and reliable analysis according to the analyzer specifications, the Mercaptans in Gas Analyzer is factory pre-tuned and supplied with full documentation and an operational method.
- **High-speed analysis.** The total cycle time of less than 90 seconds makes for productive workflows.
- Measure-anywhere capability. Its compact size makes the Analyzer suitable for on-line/at-line monitoring of operational odorant levels, as well as for analysis in the laboratory.

Among the most common elements worldwide, sulfur can be found in many different component structures and is naturally present in fossil fuels, including C1-C4 mercaptans. Sulfur can be extremely corrosive and toxic, impacting the environment and the performance of many industrial processes, causing chemical reactions, pipeline corrosion and the poisoning of catalysts.

The μ -DMD is fully integrated into the 490-GC and uses dual detection technology in which the μ -TCD and μ -DMD are connected in series. Varian GalaxieTM chromatography software processes signals from both detectors, providing selective/trace information (μ -DMD) and matrix information (μ -TCD) in a single analysis.

Specifications

Applicability

The determination of methyl mercaptan, ethyl mercaptan, iso-propoyl mercaptan, n-propyl mercaptan and TBM in gaseous hydrocarbon streams. Operational parameters, including gas flows, are factory-tuned and documented.

External Requirements

Sample must be offered as a gas, 0 °C to 110 °C, with a pressure from ambient up to 1 bar

Sample Inlet

Heated sample inlet 1/16 in. Valco®

Analysis Time

The cycle time is less than 90 seconds

Dynamic Range

• Differential Mobility Detector (μ -DMD), generally three decades but component dependent

- Micro-Thermal Conductivity Detector (μ -TCD), six decades

Minimum Detectability

• μ-TCD, 5 mg/m³ (1 ppm) for C5

• μ -DMD, 0.2 mg/m³ CH₃SH (100 ppb), 0.3 mg/m³ C₂H₅SH (100 ppb), 0.35 mg/m³ i-C₃H₇SH (100 ppb), 0.35 mg/m³ n-C₂H₅SH (100 ppb) and 0.4 mg/m³ TBM (100 ppb)

Repeatability

 $\mu\text{-}DMD$, better than 3% relative standard deviation at 10-20 times the minimum detectability, measured over at least 20 consecutive runs

Hardware configuration

• Single channel dual detector configuration, based on the 490-GC

• Option of up to two additional GC channels using the universal $\mu\text{-TCD}$ detector

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