



Our cutting-edge measuring system is designed to detect and measure ultra-low concentrations of sulfur compounds in hydrogen gas. The Gas Chromatography-Ion Mobility Spectrometer by G.A.S. (GC-IMS) ensures accuracy at every level, providing reliable data for optimal impurity management.

INTRODUCTION

Hydrogen gas, a crucial element in future industrial processes, is susceptible to contamination by sulfur compounds, posing potential challenges to operational efficiency and environmental impact. Sulfur compounds, including hydrogen sulfide (H_2S), carbonyl sulfide (COS), carbon disulfide (CS_2) and alkyl mercaptans (methyl, ethyl mercaptan (MeSH, EtSH), e.g.), can be present in hydrogen streams due to various sources such as feedstock impurities, chemical reactions, or process inefficiencies. These sulfur compounds, even at trace levels, can have profound effects on equipment integrity, catalysts, and downstream processes. Monitoring/controlling of sulfur concentrations in hydrogen gas streams are imperative to ensure product quality, prevent corrosion, and comply with environmental regulations.



GC-IMS device made by G.A.S.

Cutting-edge technologies, such as high-sensitive measuring systems like the GC-IMS, are designed to detect and quantify sulfur compounds at low concentrations, typically measured in parts per billion (ppb). Continuous monitoring with real-time alerts enables operators to take swift corrective actions, minimizing the risk of equipment damage and ensuring the purity of the hydrogen gas.

On-Line Monitoring of Low Sulfur in Hydrogen Gas



KEY FEATURES

Ultra-Low Detection Limit: The GC-IMS achieves unparalleled sensitivity, measuring sulfur compounds in hydrogen gas streams down to the one-digit parts per billion (ppb) level.

Multi-Compound Detection: Ensuring a thorough analysis for a complete understanding of your natural gas quality.

Continuous Monitoring: Enjoy 24/7 monitoring capabilities, allowing you to stay ahead of any fluctuations in sulfur compound concentrations.

Customizable Alerts: Set personalized thresholds and receive instant alerts when concentrations deviate from the desired levels, enabling swift corrective action.

Automated Result export via Modbus TCP protocol and/or current loop.

APPLICATIONS

Fuel Cell Manufacturing: Fuel cells are highly sensitive to sulfur contamination, leading to catalyst poisoning and reduced efficiency.

Petrochemical Industry: Hydrogen is used in various petrochemical processes, and even trace amounts of sulfur can damage catalysts.

Laboratories and Research Facilities:

Researchers and laboratories often require high-purity hydrogen for experiments and analytical processes.

Power Plants Using Hydrogen as Fuel:

Sulfur can adversely affect the performance of hydrogen combustion in power plants.

Semiconductor Manufacturing:

Hydrogen is used in the semiconductor industry for various processes, and sulfur contamination can impact product quality.

Hydrogen Filling Stations for Fuel Cell Vehicles:

Fuel cell vehicles require high-purity hydrogen to prevent damage to fuel cell stacks.

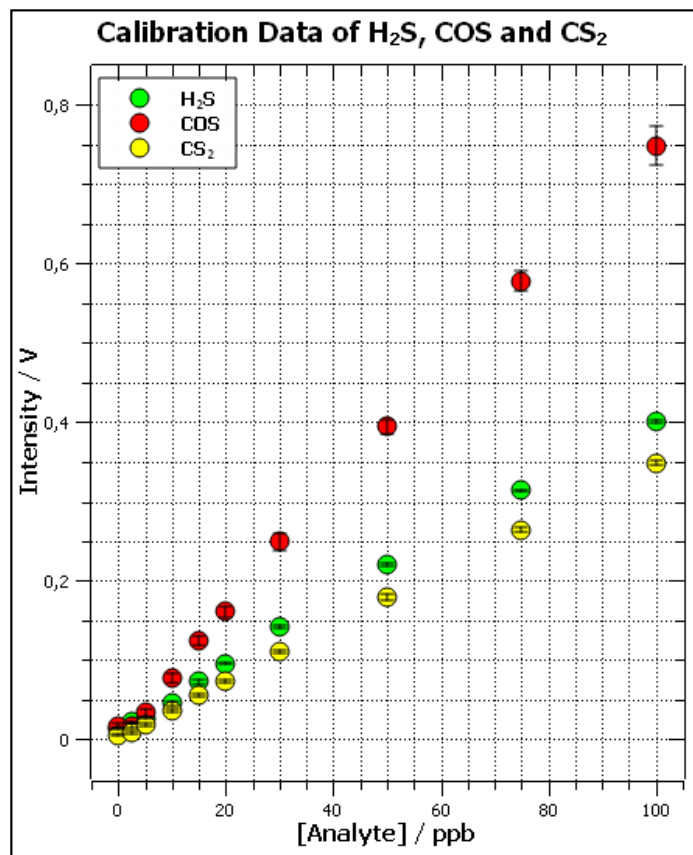
REPEATABILITY & LIMIT OF DETECTION

Analyte	Standard deviation*1/ LOD*2
H ₂ S	3.5 % / 5 ppb 7 µg/m ³
COS	2.1 % / 4 ppb 10 µg/m ³
CS ₂	2.1 % / 5 ppb 16 µg/m ³
MeSH	2.5 % / 10 ppb 20 µg/m ³
EtSH	2.8 % / 8 ppb 20 µg/m ³

*1 Standard deviation of signal intensity at a concentration of 50 ppb (n = 50).

*2 Depending on measurement set-up and matrix.

Calculation based on $I_{LOD} = I_{Blank} + 3\sigma_{Blank}$



Calibration data of H₂S, COS and CS₂ (n>=10) in the range of 0 to 100 ppb. Standard deviation of each concentration is depicted by black bars.

SPECIFICATIONS

Dimensions (l x w x h) / mm	435 x 449 x 84
Gas Inlet Connectors	3 mm Swagelok® Sulfinert®
Material Gas-bearing Parts	Sulfinert®
Result Output	Modbus TCP, current loop, USB, Ethernet
Sampling	6-port valve enables direct or bypass* sampling *integrated sample pump
Measuring Technology	GC-IMS
Reliability Features	Hardware watchdog, self-check of system parameters

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