

# Analysis of Pipeline-Quality Using a C6+ with Trace H<sub>2</sub>S Application

## Background

Hydrogen sulfide (H<sub>2</sub>S) is a component that is often present in natural gas. There are many reasons for wanting to measure it. One of the most important reasons is that H<sub>2</sub>S is a highly toxic gas that can be deadly if breathed into the lungs. This gas is also corrosive to the pipeline.

H<sub>2</sub>S mixed with H<sub>2</sub>O forms hydrosulfuric acid, which can cause pipeline metals to become brittle. Contractual obligation may require scrubbing or limiting of the H<sub>2</sub>S in natural gas before it is sold. Each pipeline company has its own acceptable limits of how much H<sub>2</sub>S can be present.

## Natural Gas Transmission and Distribution

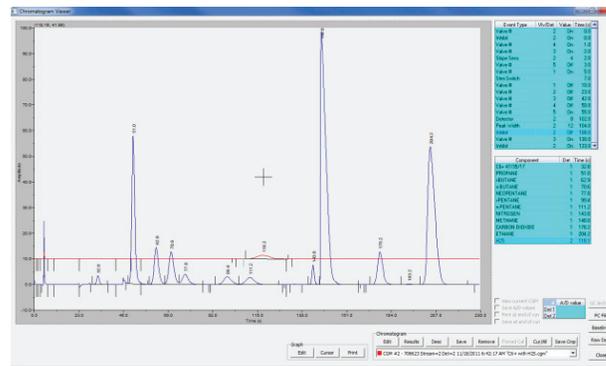
As in the standard C6+ application, the gas chromatograph supplies the heating value, gas composition, and relative density to flow computers for use in volumetric and energy calculations. However, this application also measures the trace amount of H<sub>2</sub>S which can be a critical measurement in regards to personal safety, corrosion control, and contractual agreements.

## C6+ with Trace Analysis Information:

Every five minutes the Danalyzer injects a small sample of the flowing gas stream. The gas is then separated into the following components:

Component		Range
C6+	Hexanes and heavier	(0–0.5 %) <sup>(*)</sup>
C3	Propane	(0–5 %) <sup>(*)</sup>
IC <sub>4</sub>	Isobutane	(0–1 %) <sup>(*)</sup>
NC <sub>4</sub>	Normal Butane	(0–1 %) <sup>(*)</sup>
NeoC <sub>5</sub>	Neopentane	(0–1 %) <sup>(*)</sup>
IC <sub>5</sub>	Isopentane	(0–1 %) <sup>(*)</sup>
NC <sub>5</sub>	Normal Pentane	(0–1 %) <sup>(*)</sup>
N <sub>2</sub>	Nitrogen	(0–15 %)
C1	Methane	(0–100 %)
CO <sub>2</sub>	Carbon Dioxide	(0–15 %)
C2	Ethane	(0–15 %)
H <sub>2</sub> S	Hydrogen Sulfide	(0–30 ppm)

(\*) Heavier concentrations can be measured but may require a heated sampling system to prevent drop-out.



C6+ with H<sub>2</sub>S Dual Chromatogram

## Exceptional Performance with Emerson's Gas Chromatograph Products

- Maximum custody transfer accuracy and assurance
- +/- .05 % (+/- .5 BTU / 1000 BTU) repeatability (+/- .25 BTU / 1000 BTU when in a temperature-controlled building)
- H<sub>2</sub>S +/- 3 PPM (+/- 2 PPM when in a temperature-controlled building)
- All units temperature chambered (-18 °C to 55 °C) to ensure repeatability over the complete temperature range
- Reduced installation and maintenance costs
- No shelter required
- Chromatograph valves warranted for five years

## Key Features:

- MON2000 Intuitive Man Machine Interface software (Windows®-based)
- Four separately configurable serial ports (RS232, RS422, and RS485 Modbus protocol)
- Rack mount or integral explosion-proof controller (with optional keypad and display)
- Optional integral modem (no additional enclosures required)
- Dedicated printer port (parallel or serial interface)
- Class 1, Div. 1 Groups B, C, and D (No air purge required)

Figure 1 - Oven 1: Used for measurement of C1–C6+, N<sub>2</sub>, and CO<sub>2</sub>

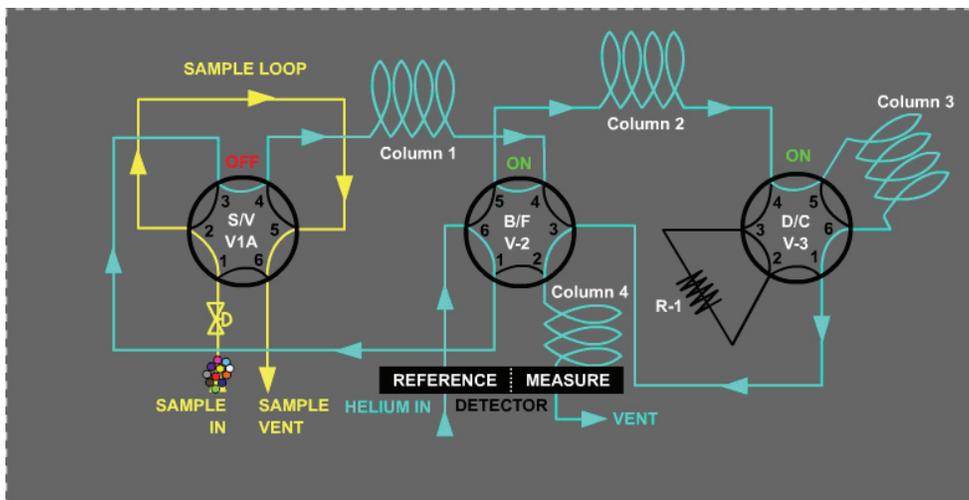
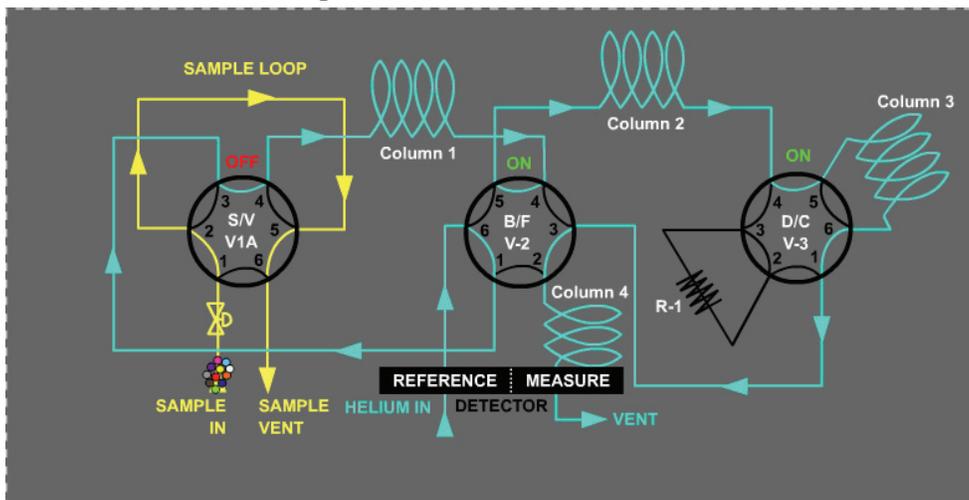


Figure 2 - Oven 2: Used for measurement of H<sub>2</sub>S



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**AMERICAS**

**Emerson Process Management**  
 Rosemount Analytical  
 Gas Chromatograph Center of Excellence  
 10241 West Little York, Suite 200  
 Houston, TX 77040 USA  
 Toll Free 866 422 3683  
 T +1 713 396 8880 (North America)  
 T +1 713 396 8759 (Latin America)  
 F +1 713 466 8175  
[gc.csc@emerson.com](mailto:gc.csc@emerson.com)

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