

Application Data Sheet

No.43

System Gas Chromatograph

High Speed Refinery Gas Analyzer Nexis GC-2030HSRGA1 GC-2014HSRGA1

This method is for determining the chemical composition of natural gases and similar gaseous mixtures within the composition range shown below. This test method provides data for calculating a sample's physical properties, such as its heating value and relative density, or for monitoring the concentrations of one or more of the components in a mixture. This analyzer uses a total of four valves and eight columns. The Sample is introduced into four sample loops for determination. Using a pre-column, C6+ components are back-flushed as a single peak. The valve timing then allows the hydrocarbons C3 through/to C5 to be separated individually through an Alumina capillary column and detected by FID. Finally, using MS-5A, O₂, N₂, CH₄, and CO are separated. At the same time, CO₂, C₂, and H₂S are separated using an Rtx-Q plot column and detected by a TCD. H₂ will be separated by MS-5A and, with the other components vented out, detected by another TCD using N₂ as carrier gas. The final analysis time is approximately six minutes. The system includes LabSolution workstation software and BTU and Specific Gravity calculation software.

Analyzer Information

System Configuration:

Four valves / eight capillary and packed columns with two TCD / one FID detectors

Sample Information:

He, H₂, O₂, N₂, CO, CO₂, H₂S, C₁-C₅, C₆+

Methods met:

ASTM-D1945, D1946, D3588, GPA-2261

Concentration Range:

No.	Name of Compound	Concentration Range	
		Low Conc.	High Conc.
1	He	0.01%	10.0%
2	H ₂	0.01%	80.0%
3	O ₂	0.01%	50.0%
4	N ₂	0.01%	50.0%
5	CH ₄	0.01%	80.0%
6	CO	0.01%	10.0%
7	CO ₂	0.01%	30.0%
8	C ₂ H ₄	0.01%	10.0%
9	C ₂ H ₆	0.01%	10.0%
10	C ₂ H ₂	0.01%	10.0%
11	H ₂ S	0.05%	30.0%
13	C ₃ H ₈	0.01%	5.0%
14	C ₃ H ₆	0.01%	5.0%
15	i-C ₄ H ₁₀	0.01%	1.0%
16	n-C ₄ H ₁₀	0.01%	1.0%
17	C ₃ H ₄	0.01%	1.0%
18	C ₂ H ₂	0.01%	1.0%
19	Other Hydrocarbons	0.01%	0.5%
20	C ₆ plus	0.01%	0.5%

Detection limits may vary depending on the sample.
Please contact us for more consultation.

System Features

- Less than 6 minutes analysis for refinery gases analysis with H₂S can be carried out
- Dual TCD with FID channels for simultaneous analysis
- By using split/splitless injector, liquid hydrocarbons can be analyzed by the FID
- Good separation for H₂ and He, and full range capability for H₂

Typical Chromatograms

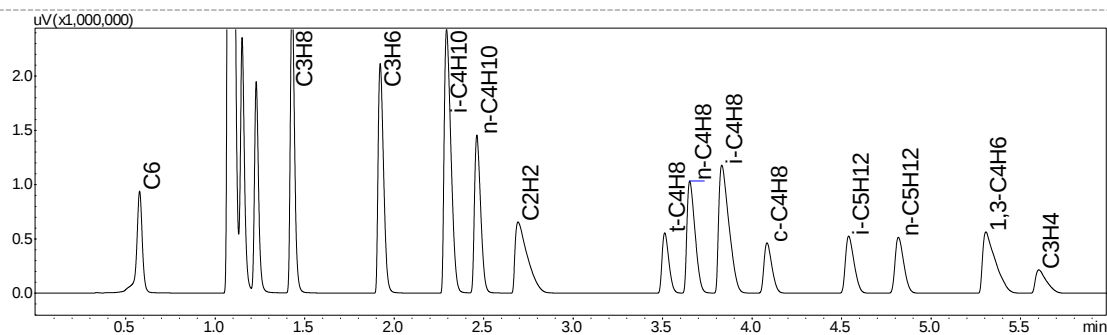


Fig. 1 Chromatogram of FID-1

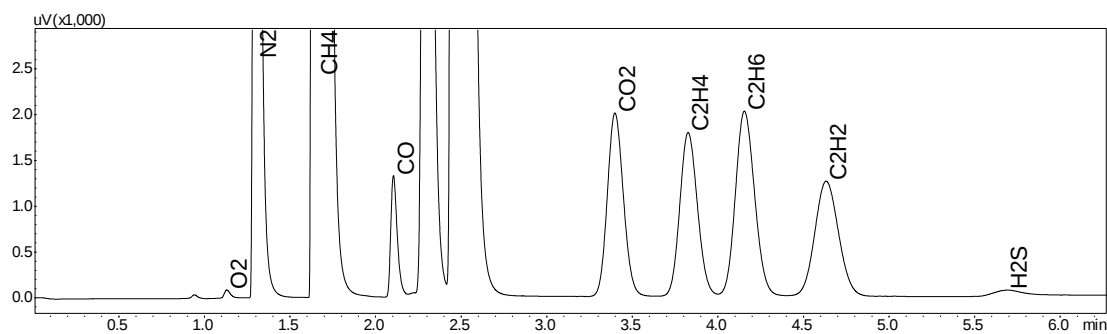


Fig. 2 Chromatogram of TCD-1

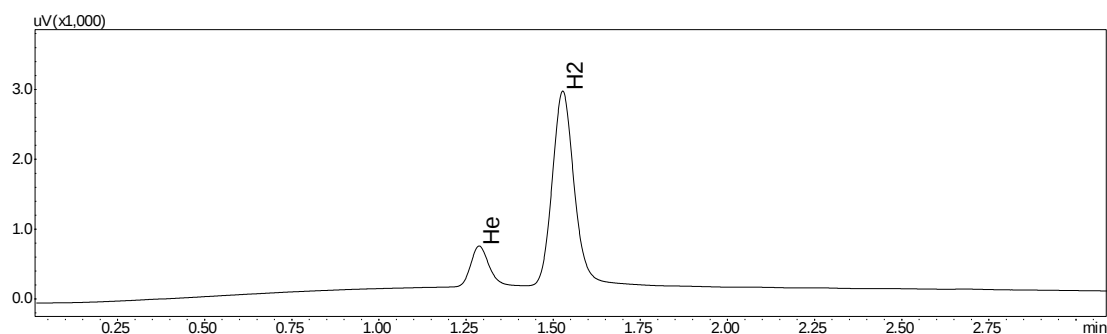


Fig. 3 Chromatogram of TCD-2