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Application Data Sheet

No.45

System Gas Chromatograph

Extended Refinery Gas Analyzer
Nexis GC-2030ERGA1
GC-2014ERGA1

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 GC is equipped with a total of four valves and nine 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-2014. The back-flushed components eluted from Porapak-N analysis are transferred to an Rtx-1 column in the second oven for separation of C6– C13 hydrocarbons, and detected by FID. 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 30 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 FID / two TCD detectors

Sample Information:
H_2, He, O_2, N_2, CO, CO_2, H_2S, C_1~C_{13}

Methods met:
ASTM-D1945, D1946, D3588, GPA-2261

Concentration Range:

No.	Name of Compound	Concentration Range	
		Low Conc.	High Conc.
1	He	0.010%	10.0%
2	H2	0.010%	10.0%
3	O2	0.010%	20.0%
4	N2	0.010%	50.0%
5	CH4	0.010%	10.0%
6	CO	0.010%	5.0%
7	CO2	0.010%	20.0%
8	C2H4	0.010%	10.0%
9	C2H6	0.010%	10.0%
10	C2H2	0.010%	10.0%
11	H2S	0.050%	30.0%
12	C3H8	0.001%	5.0%
13	C3H6	0.001%	5.0%
14	i-C4H10	0.001%	1.0%
15	n-C4H10	0.001%	1.0%
16	Propadiene	0.001%	1.0%
17	Other C4 and C5	0.001%	0.5%
18	C6-C13	0.001%	1.0%

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

System Features

- Dual TCD with dual FID channels for simultaneous analysis refinery gas
- By using split/splitless injector, liquid hydrocarbons can be analyzed by the FID
- By using second GC oven, extended hydrocarbons up to C18 can be analyzed
- Simple software enables easy dual oven operation
- Good separation for H2 and He, and full range capability for H2

Typical Chromatograms

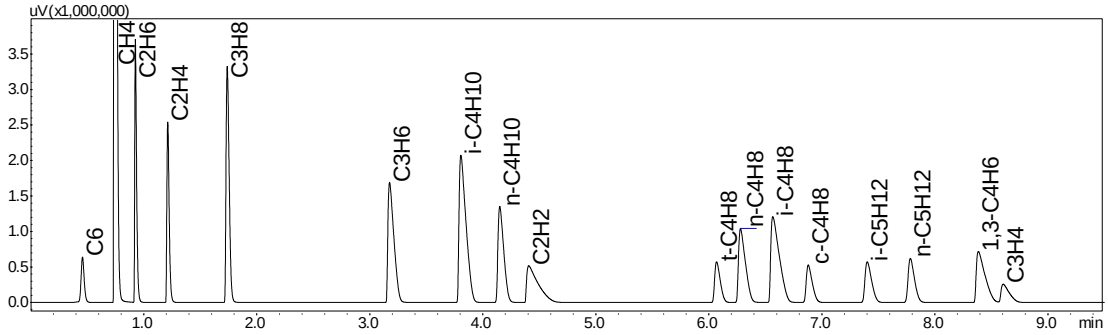

Fig. 1 Chromatogram of FID-1

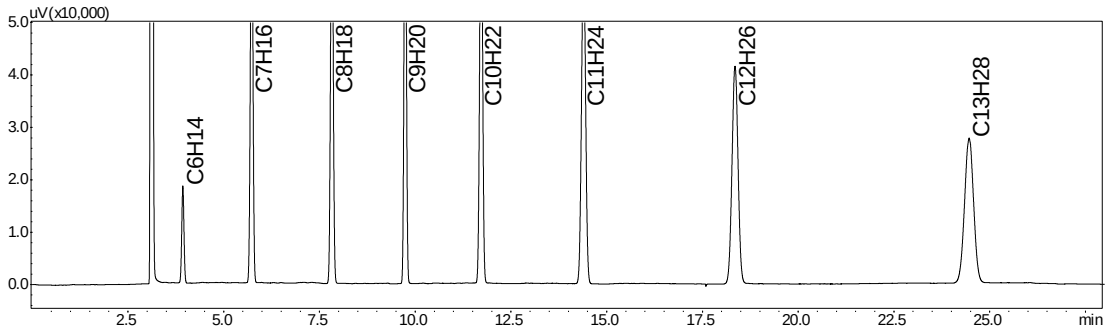

Fig. 2 Chromatogram of FID-2

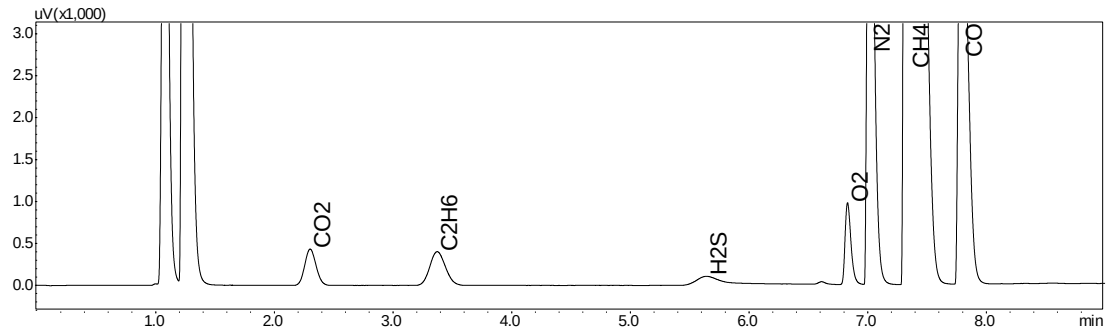

Fig. 3 Chromatogram of TCD-1

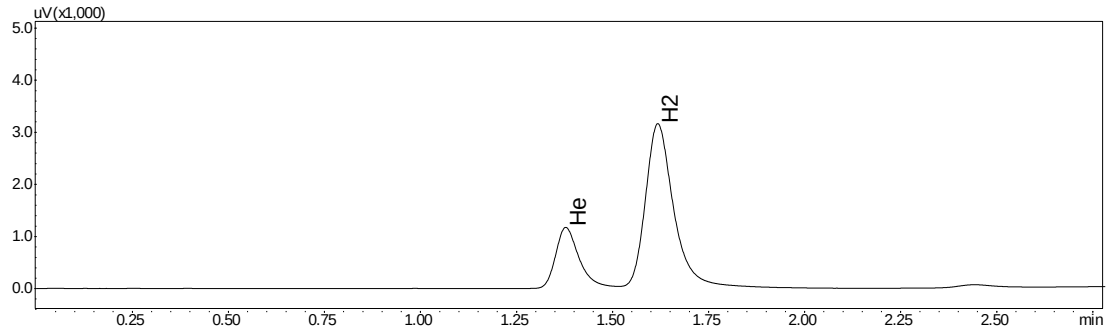

Fig. 4 Chromatogram of TCD-2

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