Liquefied Petroleum Gases

Application Note

REFERENCE METHODS

ASTM D2163, EN 27941, ISO 7941

CALIDUS™ CS UltraFast GC

Liquefied Petroleum Gases

GC analysis of liquefied petroleum gases in the range of C_1 to C_{5+} with component concentrations in the range of 1.0ppm to 100 volume percent.

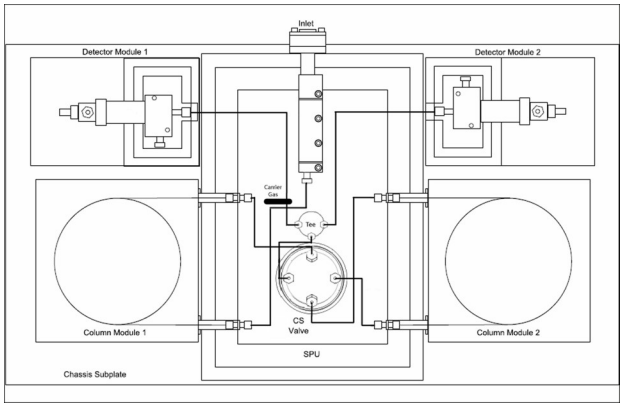


Figure 1: CALIDUS CS Functional Diagram

APPLICATION OVERVIEW

The Sample Processing Module with a standard split/splitless injection port, incorporating liquid sample valve delivers the sample to a Programmed Temperature Column Module (PTCM) followed by a column switching valve. The column switching valve allows the balance of the sample (and close eluting peaks) to be switched ("heartcut") to PTCM2 for further separation and detection by an independent detector. The inlet includes septum purge to prevent bleed components from entering the system.

The two PTCMs are independently controlled by the method.

PTCM 1 contains a MXT-Alumina Bond/Na2SO4 resistively heated stainless steel capillary column and is operated in a temperature programmed mode. This column provides separation of C1-C5 (See Figure 2).

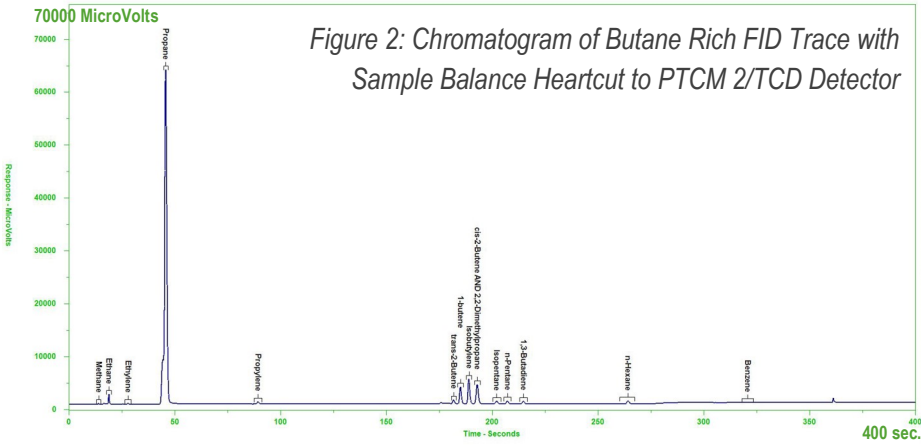
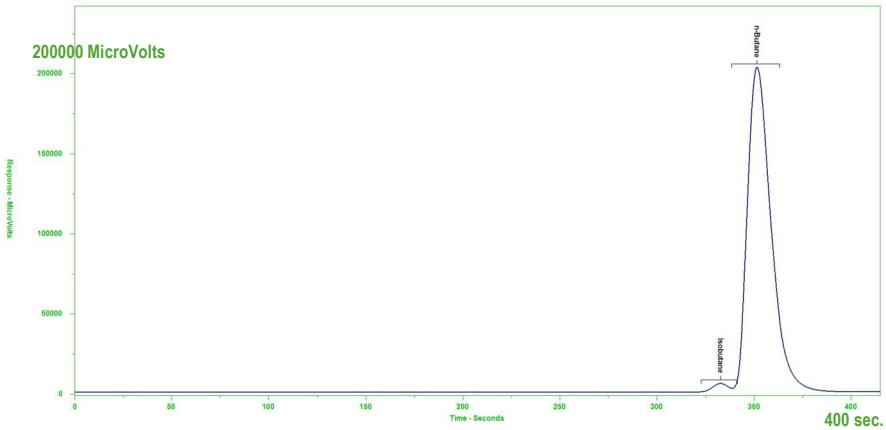


Figure 2: Chromatogram of Butane Rich FID Trace with Sample Balance Heartcut to PTCM 2/TCD Detector



PTCM 2 contains a MXT-HS-Q resistively heated stainless steel capillary column and is operated in a delayed temperature programmed mode. This column provides separation of n-Butane and iso-Butane in Butane rich samples, and Propane in Propane rich samples (See Figure 3).

Figure 3: Chromatogram of PTCM2/TCD Detector Trace of Butane Rich Sample

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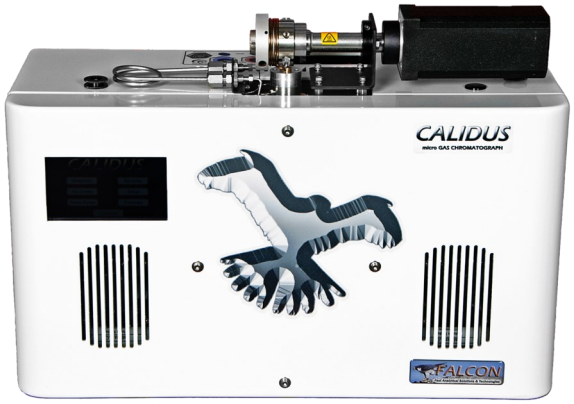

The analyzer includes the Chromperfect® chromatography data system, fully integrated, with InfoMetrix® LineUp™, running on a Windows PC for calculating component concentrations in volume percent.

Implications

Whether it is for feed stock, fuel, or calculation of physical properties, the accuracy and precision of LPG compositional data is extremely important.

- Parallel analysis utilizing FID and TCD
  - FID supports "low" concentration hydrocarbon analysis with an LOP of 1.0ppm
  - TCD supports "high" concentration (balance of sample) hydrocarbon analysis with an LOD of 0.01%
- A complete range of LPG analysis, in one instrument, in the laboratory, at-line, online, or in the field
- Enables greater product throughput for increased revenues and profits. Smaller footprint means more bench top or analyzer shelter space. In the lab or the plant, space is always at a premium
- Speed and precision for quicker turnaround
- Reduction in utility and maintenance cost (i.e. power and consumables)

Major Analytical Advantages

Fastest analysis time in the industry for LPG, with excellent performance and reliability.

Incorporates patented Resistively Heated Stainless Steel Capillary Column Module and its thermal management system, resulting in a paradigm shift in GC analysis.

The most powerful, durable, compact and lightweight analytical solution for Ultra-Fast LPG Analysis (43 cm L X 21.5 cm D X 27.9 cm W, wt. 9.07 kg).

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