Global Analyser Solutions

Low-level sulphur analyser

PG600 | PG610

- Analysing sulphur components at ppb levels
- FPD or PFPD
- Can be combined with other analysers (RGA, PGA, etc.)
- ASTM D6228, D5504, ISO 19739

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Low-level sulphur analysers for petrochemical samples

The GAS Low-level sulphur analyser based on Trace GC 1600 provides precise measurement of volatile sulphur species in hydrocarbon streams and bulk gases. It can operate independently as a standalone analyser or be combined with existing instruments like refinery gas analyser (RGA) or permanent gas analyser (PGA) to provide an extra analysis channel.

Principle of operation

The low-sulphur analyser for petrochemical applications comprises a gas sampling valve (GSV), a Split/Splitless Injector (SSL), a suitable separation column, and a sulphur-selective detector, either an FPD (Flame Photometric Detector) or a PFPD (Pulsed-FPD); see figure 1. As sulphur species readily adsorb onto active surfaces, Sulfinert (SilcoNert 2000) deactivation is applied to the entire sample path, a measure that is critical for reliable and accurate quantification.

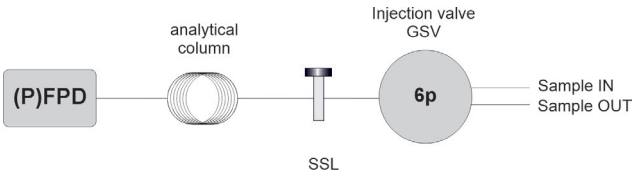

Figure 1 Diagram low level sulphur analyser

FPD or PFPD?

PFPD and FPD both offer excellent long-term stability. PFPD offers the best sensitivity (LOD 20-30ppb; see figure 6) while FPD provides a cost-effective solution when detection limits of 100-200 ppb are sufficient.

Choice of separation column

The choice of the optimal separation column depends on the components being analysed and the sample matrix. Available column phases include non-polar, sulphur-selective, and porous polymer.

Specification

- Thermo Trace GC1600 with standard or XXL valve oven, GSV, SSL, capillary column, FPD or PFPD detection
- Chromeleon chromatography data system
- Runtime: dependent on application
- Minimum detectability FPD: 100-200 ppb; PFPD: 20-30 ppb
- Repeatability < 1%

Figure 2 iConnect FPD detector module (Trace GC 1600)

Result

Figures 3-6 show chromatogram, repeatability data, linearity data and table with limits of detector for PFPD

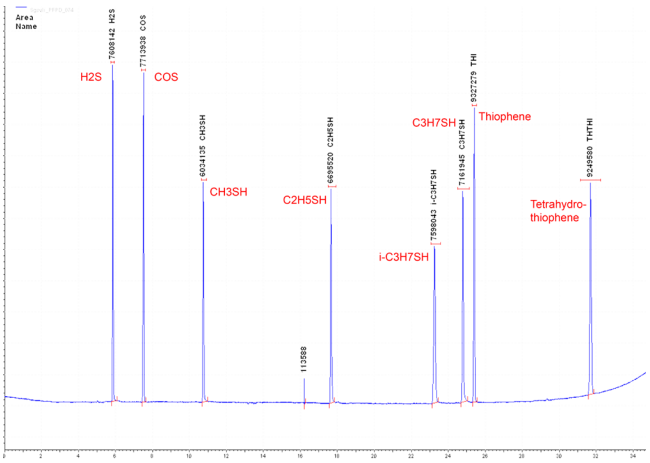

Figure 3 Chromatogram calibration standard. Concentration level: 5 ppm per component. Detector: PFPD. Column: Select Low Sulphur

GC-PFPD ID	H2S Area	COS Area	CH3SH Area	C2H5SH Area	i-C3H7SH Area	C3H7SH Area	THI Area	THTHI Area
PFPD_071	7653680	7716514	6026713	6764998	7612207	7096988	9317300	9228699
PFPD_072	7575351	7695225	5928568	6794046	7631111	7204149	9296086	9213385
PFPD_073	7648397	7698897	6013745	6725392	7641811	7193838	9352864	9246370
PFPD_074	7608142	7713938	6034135	6695520	7598043	7161945	9327279	9249580
Min:	7575351	7695225	5928568	6695520	7598043	7096988	9296086	9213385
Max:	7653680	7716514	6034135	6794046	7641811	7204149	9352864	9249580
Mean:	7621393	7706144	6000790	6744989	7620793	7164230	9323382	9234509
Std Dev:	38820	10646	48880	43352	19489	48294	23569	16811
%RSD:	0.48	0.14	0.81	0.64	0.26	0.67	0.25	0.18

Figure 4 Statistical data of the chromatogram shown in figure 3

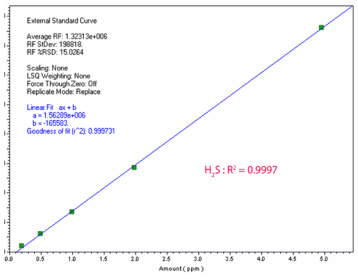

Figure 5 Linearity curve of H_2S: r^2 = 0.9997 (100ppb-5 ppm). (r^2 > 0.995 for all components)

Component	LOD (ppb)
H2S	***17***
COS	***18***
CH3SH	***25***
C2H5SH	***27***
i-C3H7SH	***39***
C3H7SH	***30***
THI	***22***
THTHI	***30***

Figure 6 Limits of detection for PFPD

Ordering information	PG60X - ABCDE Low-level sulphur analyser using PFPD PG610 - ABCDE Low-level sulphur analyser using FPD			
code X	0	1	2	3
GC model, power	1600, 230V	1610, 230V	1600, 115V	1610, 115V

For selecting options ABCDE (e.g. valve type and passivation, pump and vacuum sampling, rotameter and sample connections, pressure and moisture sensors, hydrogen sensor for safety shut-off, power plug type and more), see the options table in the order guide.

About GAS

Global Analyser Solutions provides GC & GC-MS solutions for Energy, Refinery, Chemical and Environmental markets. Our analysers address a broad spectrum of measuring requirements with high precision and reliability. Please reach out for more information on our website. www.gassite.com