SeNse

Sulfur/Nitrogen Selective Detector for Gas Chromatography Applications

- ⊕ Sulfur & Nitrogen Chemiluminescence Detector (SCD/NCD)
- ⊕ Best in Market Sensitivity, Stability, and Equimolarity for best Return On Investment
- ⊕ Compatible with Most Major Chromatography Systems
- ⊕ Turnkey Solutions Compatible with ASTM D5623, D5504, D7011, and D7807

AC SeNse

SULFUR/NITROGEN CHEMILUMINESCENCE DETECTOR FOR GC APPLICATIONS

In many cases reporting total Sulfur concentration is not sufficient, and determining and accurately quantifying individual Sulfur & Nitrogen species is required.

Gas Chromatographs equipped with specific Chemiluminescence detectors offers the possibility of characterizing these species resulting in a more detailed chemical composition characterization. As a gas chromatographic detector, the PAC SeNse Chemiluminescence Detector is the most advanced GC Detector available for the specific determination of sulfur and nitrogen containing compounds.

SeNse provides best sensitivity, best baseline stability and best equimolarity, and will flexibly fit most chromatographic solutions.

EASE OF USE

- Easy to use on-screen User Interface
- Independent of Chromatography Data System & instrument
- Automated vacuum leak check
- Use of synthetic air improves stability and reduces oxygen related risks! (Sulfur mode only)
- Universal mounting on any leading GC brand(s)

BEST IN MARKET PERFORMANCE FOR HIGH ROI

- Best in market stability, sensitivity, and equimolarity
- Constant pressure point in detector base ensures baseline stability
- Enhanced furnace temperature control improves temperature accuracy and reduces downtime
- New patented probe design improves catalyst capacity and stability of baseline

FULL COMPLIANCY

- Complies to all SCD standardized methods:
  - ASTM D5504
  - ASTM D5623
  - ASTM D7011
  - ASTM D7807
  - UOP 791

ANALYSIS & PERFORMANCE

With Sulfur/Nitrogen species known for their detrimental effects on catalysts in refining processes even at the lowest levels, the need for a constant monitoring of these species throughout the complete process is quite evident. This task mandates solutions that are not only fast and sensitive, but above all very robust in time, so they can just do what they were designed for: produce the correct value.

SeNse Chemiluminescence detector for gas chromatography provides all these arguments. With a Sensitivity of 0.3 pgS/sec (when using Air as oxydizer), true equimolarity, 4 decades of linearity, 5.0E+7 in selectivity, combined with an unrivaled stability over time, SeNse clearly is the market leading technology for sulfur/nitrogen detection.

SeNse's new ceramics, its Constant Detector Base pressure system, redesigned electronics and furnace the system has already proven to be extremely stable, providing more reliable data over time. SeNse uses air instead of oxygen! Air is clearly more economical, but also more readily available, and definitely safer in the lab.
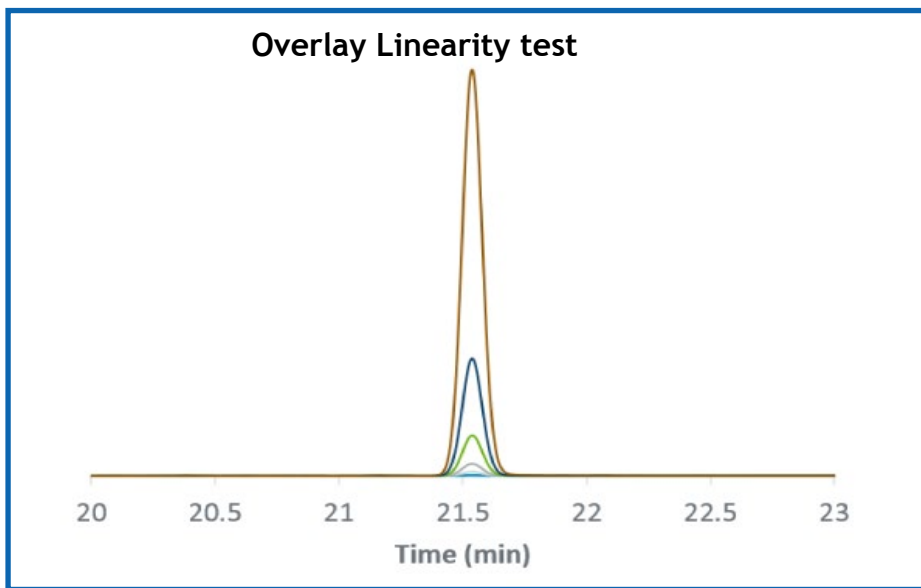

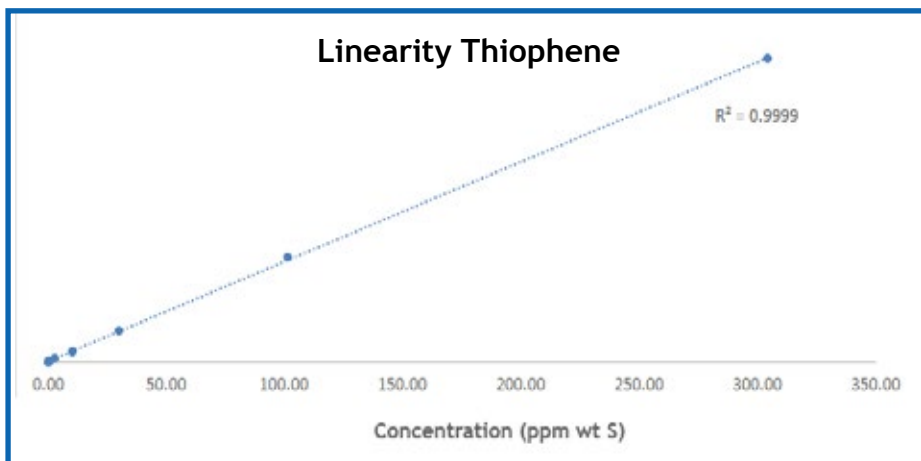*Figure 1: Linearity overlay of 30 ppb to 100 ppm tert-Butyl Disulfide*

Figure 2: Linearity of 30 ppb to 300 ppm Thiophene

Conc. ppm WT S	Average Area	Response Factor
0.03	1.4	2.14E-02
0.102	4.7	2.15E-02
0.302	14.0	2.16E-02
1.019	46.3	2.20E-02
3.059	134.8	2.27E-02
10.158	459.6	2.21E-02
30.147	1351.0	2.23E-02
101.402	4650.3	2.18E-02
	Average	2.19E-02
	st.dev	4.24E-04
	RSD	2%

Table 1: Response factor values of tert-butyl disulfide over three order of magnitude

⊕PAC

SPECIFICATIONS

Ordering Information: Detector Only	
37.00.001 37.00.002 37.00.005	SeNse, Sulfur configuration SeNse, Nitrogen configuration SeNse, Sulfur + Nitrogen configuration
80.24.401 / 80.24.402	Vacuum Pump 115V/230V
G3456A G1556A	7890 Analog Interface Board (includes cable) Single Channel Analog Input Board (includes cable)
37.00.010 37.00.011	Mounting Kit Dual Mounting Kit

Ordering Information: Analyzers	
CCG6100A/C CCG6101A/C CCG6102A/C CCG6103A/C CCG6104A/C	ASTM D5623 Sulfur System, 7890GC ASTM D5623 Sulfur System, incl. LSV, 7890GC ASTM D5504 / D5623 Sulfur System, incl. GSV, 120V 7890GC ASTM D5504 / D5623 Sulfur System, incl. GSV and LSV, 120V 7890GC ASTM D5504 Ultra Low Sulfur System, 120V 7890GC

Analysis Scope	
Method compliancy	ASTM D5504: Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence ASTM D5623: Sulfur Compounds in Light Petroleum Liquids by Gas Chromatography and Sulfur Selective Detection ASTM D7011: Determination of Trace Thiophene in Refined Benzene by Gas Chromatography and Sulfur Selective Detection ASTM D7807: Determination of Boiling Range Distribution of Hydrocarbon and Sulfur Components of Petroleum Distillates by Gas Chromatography and Chemiluminescence Detection

Analytical Performance

	Detector Only		
	Sulfur *Air as oxidizer*	Sulfur *O$_2$ as oxidizer*	Nitrogen *O$_2$ as oxidizer*
Sensitivity	< 0.3 pgS/s	≤ 0.15 pg N/s	≤ 3 pg N/s
Stability	≤ 2.0 % RSD over 2 hrs ≤ 3.0 % RSD over 24 hrs ≤ 3.0 % RSD over 72 hrs	≤ 2.0 % RSD over 2 hrs ≤ 3.0 % RSD over 24 hrs ≤ 3.0 % RSD over 72 hrs	≤ 2.0 % RSD over 2 hrs ≤ 2.0 % RSD over 24 hrs ≤ 2.0 % RSD over 72 hrs
Linearity	≥ 10^4	≥ 10^4	≥ 10^4
Equimolarity	≤ 10% RSD	≤ 10% RSD	≤ 5% RSD
Selectivity	≥ 5.0 e7	≥ 5.0 e7	≥ 1.0 e6
	SeNse Analyzers		
	D5504	D5623	D7011
LDL	<10/<100 ppbM*	<100 ppb WT S*	<20 ppb WT**
LDR	0.01-100 ppmM or 0.1-1000 ppmM*	0.1-1000 ppm WT S*	0.02-200 ppm WT
Repeatability	To method	To method	To method
Separation	To method	To method	To method
	*configuration dependent **MDL 6σ		

<div style="writing-mode: vertical">Continuing research and development may result in specifications or appearance changes at any time</div>

ABOUT PAC

PAC develops advanced instrumentation for lab and process applications based on strong **Analytical Expertise** that ensures **Optimal Performance** for our clients. Our analyzers help our clients meet complex industry challenges by providing a low cost of ownership, safe operation, high performance with fast, accurate, and actionable results, high uptime through reliable instrumentation, and compliance with standard methods.

Our solutions are from industry-leading brands: AC Analytical Controls, Advanced Sensors, Alcor, Antek, Herzog, ISL, Cambridge Viscosity, PSPI, and PetroSpec. We are committed to delivering superior and local customer service worldwide with 16 office locations and a network of over 50 distributors. PAC operates as a unit of Roper Technologies, Inc., a diversified technology company and a constituent of S&P 500, Fortune 1000, and Russell 1000 indices.

HEADQUARTERS

PAC LP | 8824 Fallbrook Drive | Houston, Texas 77064 | USA
T: +1 800.444.8378 | F: +1 281.580.0719

Contact us for more details.

Visit our website to find the PAC representative closest to