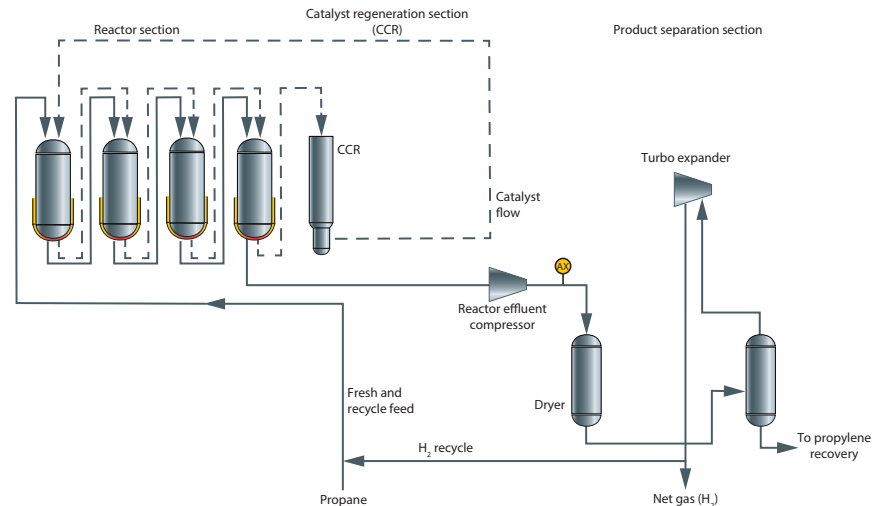


# Petrochem: H<sub>2</sub>S in UOP C<sub>3</sub> Oleflex process reactor effluent

## Benefits at a glance

- Exceptionally fast response to H<sub>2</sub>S concentration changes
- Laser-based measurement is highly selective and accurate for H<sub>2</sub>S measurement in C<sub>3</sub> Oleflex process reactor effluent gas
- Low maintenance and OPEX costs – no proprietary, consumable lead acetate tape and acetic acid reagent
- Laser-based analyzer does not require mechanical components (tape drive system for paper reels / cartridges) for operation and measurements



The UOP C<sub>3</sub> Oleflex propane dehydrogenation (PDH) process

## The UOP C<sub>3</sub> Oleflex propane dehydrogenation (PDH) process

produces polymer-grade propylene from propane feedstock. Propane flows through four reactors containing platinum-based catalyst which dehydrogenates propane into propylene. The catalyst is slowly circulated to a continuous catalyst regeneration (CCR) vessel where coke deposits on the catalyst are removed by high-temperature oxidation to restore catalyst activity. Reactor effluent is sent to a product separation section to fractionate and recover propylene and send recycle gas to the reactors.

## On-line H<sub>2</sub>S measurement

of the effluent gas from the C<sub>3</sub> Oleflex reactors helps prevent recycle gas with excessive levels of H<sub>2</sub>S from entering the reactors and reducing catalyst activity and the yield of propylene.

## Endress+Hauser's solution

Tunable diode laser absorption spectroscopy (TDLAS) is a SpectraSensors technology that has proven effective in this important measurement. TDLAS analyzers have an exceptionally fast response to changes in H<sub>2</sub>S concentration enabling improved process control. Laser spectroscopy measurement of H<sub>2</sub>S requires no proprietary, consumable items or reagents such as lead acetate paper tape, so TDLAS analyzers are more reliable and have higher analyzer availability than lead acetate tape analyzers.

## Application data

Target component (Analyte)	H <sub>2</sub> S in UOP C <sub>3</sub> Oleflex PDH process reactor effluent compressor discharge
Typical measurement range	0-150 ppmv
Typical repeatability	± 1 ppmv or 2% of reading (whichever is greater)
Measurement response time	1 to ~60 seconds
Principle of measurement	Tunable diode laser absorption spectroscopy (TDLAS)
Validation	Certified blend of H <sub>2</sub> S in nitrogen

## Typical background stream composition

Component	Minimum (Mol%)	Typical (Mol%)	Maximum (Mol%)
Hydrogen (H <sub>2</sub> )	32	42	46
Methane (CH <sub>4</sub> )	0.2	3	4
Ethane (C <sub>2</sub> H <sub>6</sub> )	0.2	1.5	3
Ethylene (C <sub>2</sub> H <sub>4</sub> )	0	0.1	0.2
Propane (C <sub>3</sub> H <sub>8</sub> )	32	36	58
Propylene (C <sub>3</sub> H <sub>6</sub> )	0.9	15.5	18
Butanes and heavier (C <sub>4</sub> +)	0	0.1	0.3