

## THIOPAQ O&G

### Biodesulfurization process

#### APPLICATIONS

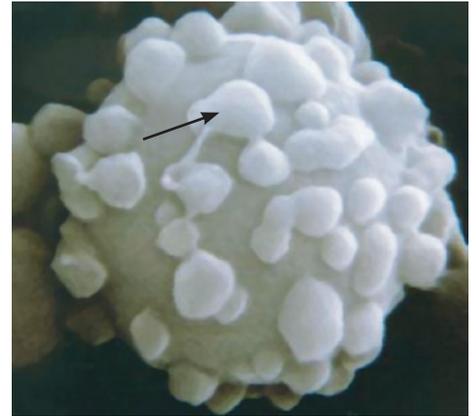
- Natural gas pressure range between 2- and 1,300-psi [0.01- and 9.0-MPa] gauge pressure
- Debottlenecking sulfur recovery units
- Claus process tail gas
- Replacing or converting alternative aqueous processes that are prone to plugging

#### ADVANTAGES

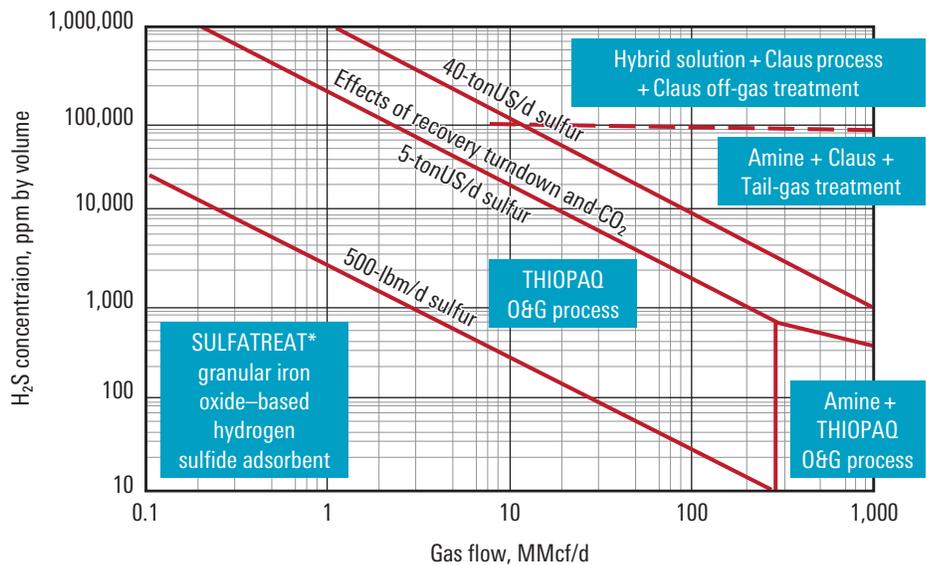
- Reliability and simplicity
- Reduced operating costs
- Inherent compliance with stringent HSE regulations
- Environmental Technology Verification (ETV) program qualification

The removal of H<sub>2</sub>S from natural gas has never been easy. The THIOPAQ O&G® biodesulfurization process can remove hydrogen sulfide (H<sub>2</sub>S) from low-, medium-, and high-pressure natural gas streams. In this process, a gas stream containing H<sub>2</sub>S contacts an aqueous soda solution containing thiobacillus bacteria in an absorber. The soda absorbs the H<sub>2</sub>S and is transferred to an aerated atmospheric tank where the bacteria biologically converts the H<sub>2</sub>S to elemental sulfur.

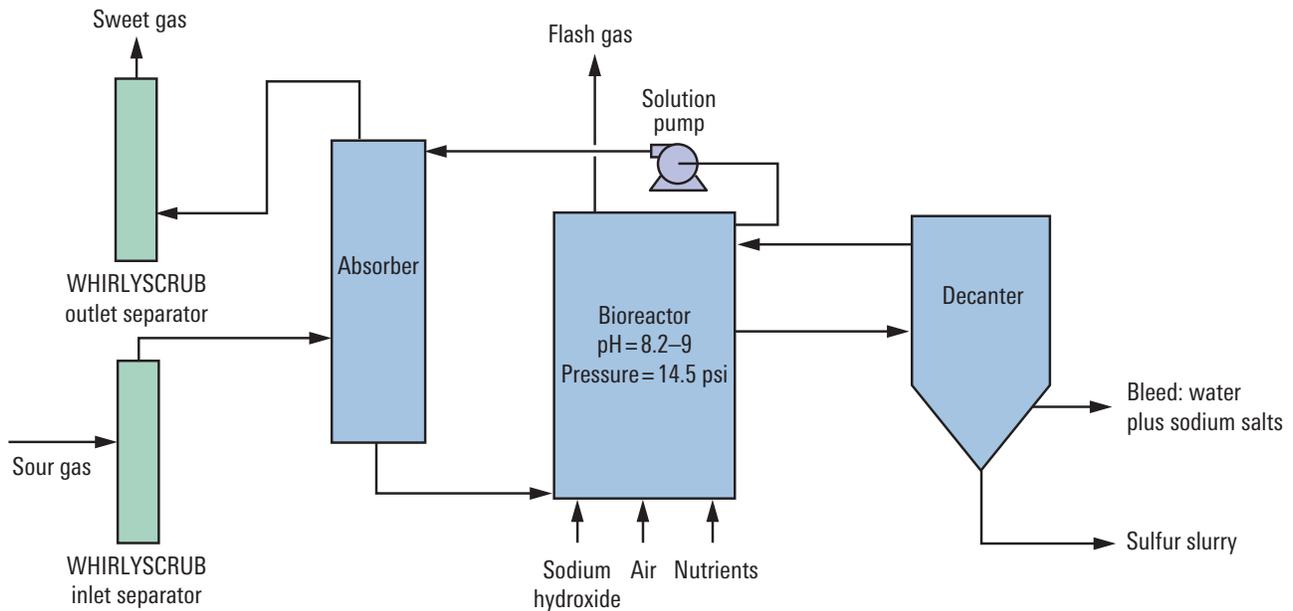
This process is ideally suited to environmentally sensitive areas where venting, incineration, or reinjection of the H<sub>2</sub>S are not desirable options. Treated outlet gas can readily meet a less-than 4-ppm H<sub>2</sub>S specification. The application ranges from approximately 500 lbm/d to 40 tonUS/d of sulfur per day. The biological sulfur slurry produced can be used for agricultural purposes or purified to a high-quality (>99%+) sulfur cake.



*Thiobacillus bacteria and sulfur nodules (indicated by arrow).*



*H<sub>2</sub>S removal technology selection.*



THIOPAQ O&G process flow diagram

## Advantages of the THIOPAQ O&G process

### Reliability

- Less equipment compared with conventional desulfurization processes
- No plugging or fouling problems because of the biological sulfur's hydrophilic nature
- Use of thiobacillus bacteria, which are naturally occurring, robust, self sustaining, and self regulating

### Simplicity of operation

- Easy-to-control operating parameters
- Minimal supervision requirements
- Massive buffering capacity that minimizes the impact of upsets
- Wide turndown in gas flow and H<sub>2</sub>S inlet concentration

### Low operating costs

- Much lower chemical makeup compared with alternative aqueous technologies
- Less equipment to maintain and operate compared with conventional amine or Claus technology

### Simplicity of design

- Operation at low inlet pressures
- Integration of gas purification and sulfur recovery in one process
- Elimination of the need to filter carbon or particulates
- Process regeneration does not require heat

### Intrinsic safety

- H<sub>2</sub>S not concentrated at any time during the process
- H<sub>2</sub>S physically bound to the gas scrubbing solution

### Environmental consciousness

- Air vent gas with less than 1-ppm H<sub>2</sub>S by volume
- Sulfur slurry and cake that can be used as fertilizer

### Cost estimates

Capital and operating cost estimates can be provided quickly. Process parameters such as pressure, temperature, flow rate, and composition are needed to generate budget estimates.