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THIOPAQ

Biodesulfurization process

APPLICATIONS

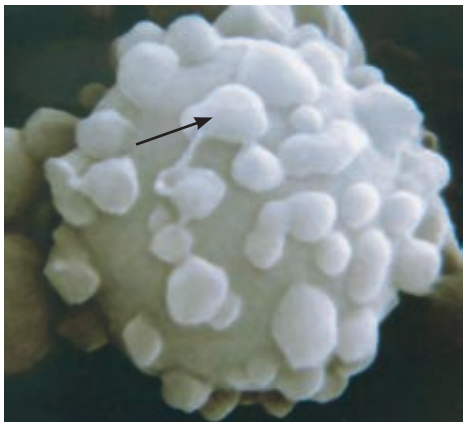
- Biogas and landfill gas pressure range from ambient to elevated pressure
- Debottlenecking existing sulfur recovery equipment
- Replacing or converting alternative aqueous processes that are prone to plugging
- Replacing expensive caustic scrubbers or triazine processes

ADVANTAGES

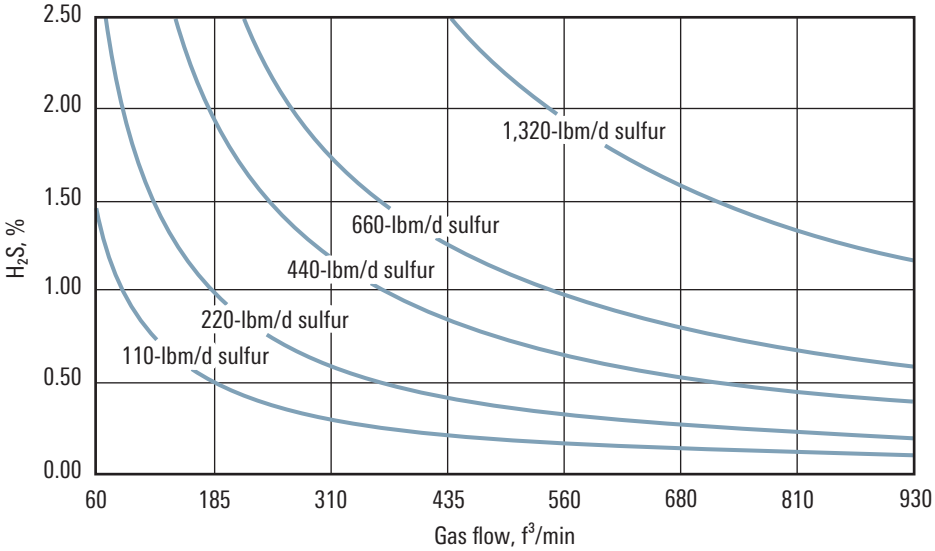
- Reliability and simplicity
- Reduced operating costs
- Inherent compliance with stringent HSE regulations
- Environmental Technology Verification (ETV) program qualification

The removal of hydrogen sulfide (H_2S) from biogas has never been easy. The THIOPAQ® biodesulfurization process was developed to remove hydrogen sulfide (H_2S) from low-pressure biogas streams. In this process, a gas stream containing H_2S contacts an aqueous solution containing thiobacillus bacteria in an absorber. The solution absorbs the H_2S and is transferred to an aerated atmospheric tank, where the bacteria biologically converts the H_2S to elemental sulfur.

This process is ideally suited for environmentally sensitive areas where venting, incineration, or reinjection of the H_2S are not desirable. Treated outlet gas can readily meet a less-than 100-ppm H_2S specification or as low as 5 ppm. The application range is from approximately 500 lbm/d to 20 tonUS/d of sulfur. The biological sulfur slurry produced may be used for agricultural purposes or purified to a high-quality (>99%) sulfur cake.



Thiobacillus bacteria and sulfur nodules (indicated by arrow).



Sulfur load recovered for H_2S and gas flow.

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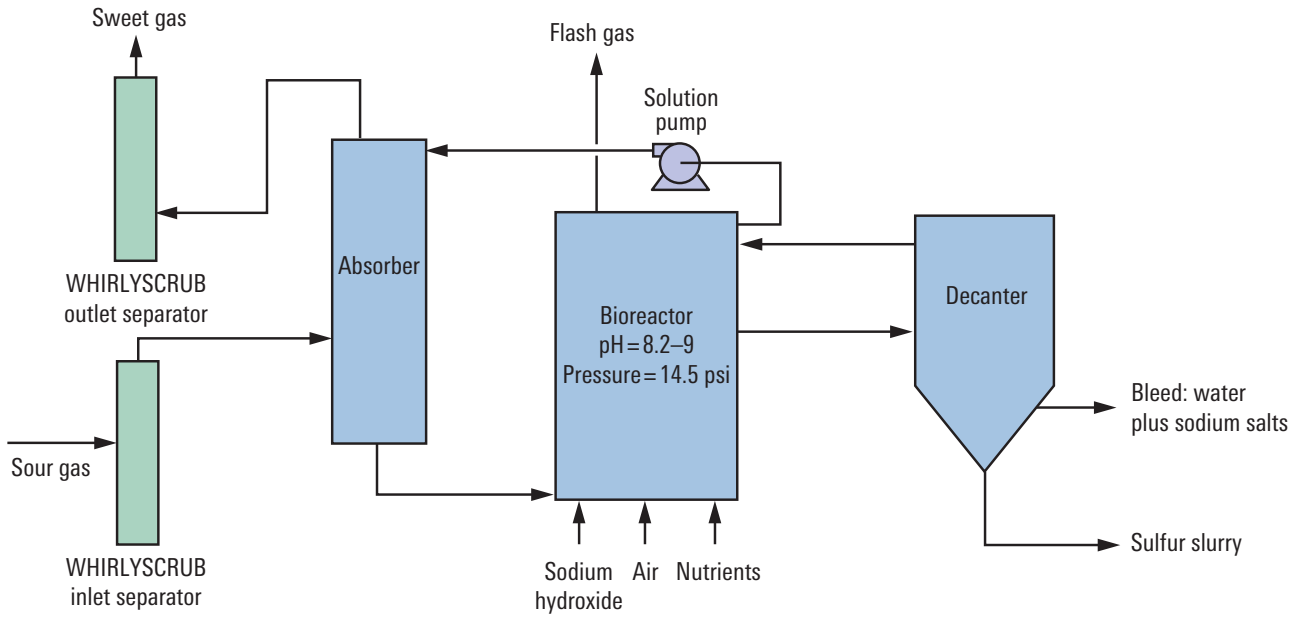

THIOPAQ biodesulfurization process flow diagram.

Advantages of the THIOPAQ biodesulfurization 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
- Reliable operation of more than 150 low-pressure systems worldwide

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_2S 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 that does not require heat

Intrinsic safety

- H_2S not concentrated at any time during the process
- H_2S physically bound to the gas scrubbing solution

Environmental consciousness

- Air vent gas with less than 1-ppm H_2S
- Sulfur slurry and cake that can be used as fertilizer

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