

APPLICATIONS

The Sulfinol process is a regenerative process developed to remove H₂S, CO₂, COS and mercaptans from gases. The sulfur compounds in the product gas can be removed to low ppm levels. This process has been developed specifically for treating large quantities of gas, such as natural gas, which are available at elevated pressures.

The Sulfinol process is unique in the class of absorption processes because it uses a mixture of solvents, which allows it to behave as both a chemical and a physical absorption process. The solvent is composed of Sulfolane, DIPA or MDEA and water. The acid gas loading of the Sulfinol solvent is higher, and the energy required for its regeneration is lower, than those of purely chemical solvents.

At the same time, it has the advantage over purely physical solvents in that severe product specifications can be met more easily, and co-absorption of hydrocarbons is relatively low. The Sulfinol-M process is used for selective absorption of H₂S, COS and mercaptans, while co-absorbing only part of the CO₂. Deep removal of CO₂ in LNG plants is another application. Integration of gas treating with the SCOT solvent system is an option.

DESCRIPTION

The feed gas is contacted counter-currently in an absorption column with the Sulfinol solvent. The regenerated solvent is introduced at the top of the absorber. The with sulfur compounds loaded solvent (rich solvent) is heated by heat exchange with the regenerated solvent and is fed back to the regenerator, where it is further heated and freed of the acid components with steam.

The acid components removed from the solvent in the regenerator, together with excess steam, are cooled with air or water, so that the major part of the steam is condensed. The sour condensate is reintroduced into the system as a reflux. The acid gas is passed to the sulfur recovery plant (Claus plant), in which elemental sulfur is recovered. The application of a flash vessel is optional; it depends on the heavier hydrocarbon content of the feed gas.

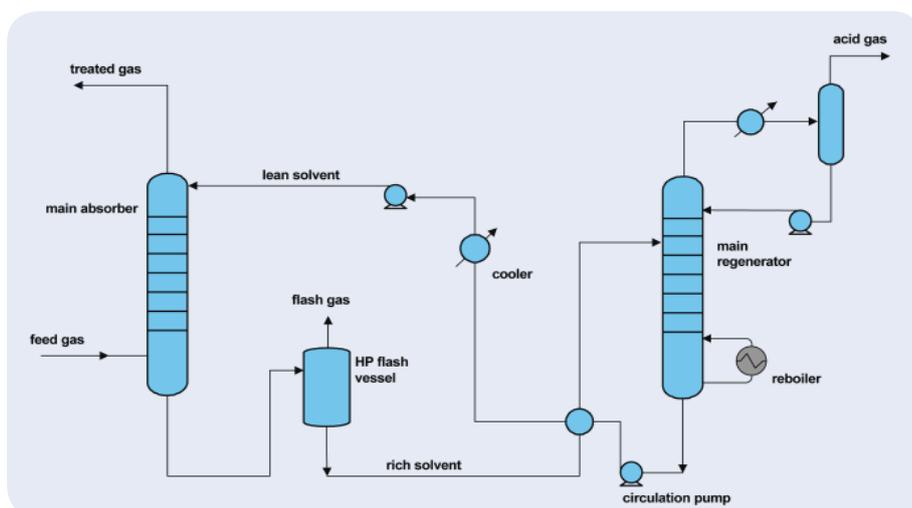
OPERATING CONDITIONS

Very wide ranges of treating pressures and contaminant concentrations can be accommodated. Natural gas pipeline specifications are easily met. Removal of organic sulfur compounds is usually accomplished by the solvent circulations as set by H₂S and CO₂. In LNG plants a specification of 50 ppm CO₂ prior to liquefaction is attained without difficulty.

Streams to be treated	Contaminants removed
Natural gases	H ₂ S, CO ₂ , COS, RSH + organic S
Oil and coal gasification	H ₂ S, COS (H ₂ S is selectively removed)
Natural gases	H ₂ S, CO ₂ (partly)
LNG feedstock, hydrogen manufacture synthesis gas	CO ₂

UTILITIES

The utility consumption varies widely with feed gas composition and product gas specification.



FEATURES

- » Removal of H₂S, COS and organic sulfur to natural gas pipeline specification
- » Low steam consumption and solvent circulation
- » Low corrosion rates
- » Selective removal of H₂S in some natural gas applications
- » Smaller equipment due to low foaming tendency
- » High on-stream factor

REFERENCES

More than 210 Sulfinol units, ranging in capacity from 10,000 Nm³/d to 32 million Nm³/d are in operation throughout the world, demonstrating the reliability of the process.

LICENSOR

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