Membrane Contactors (MC) for H_2S Removal

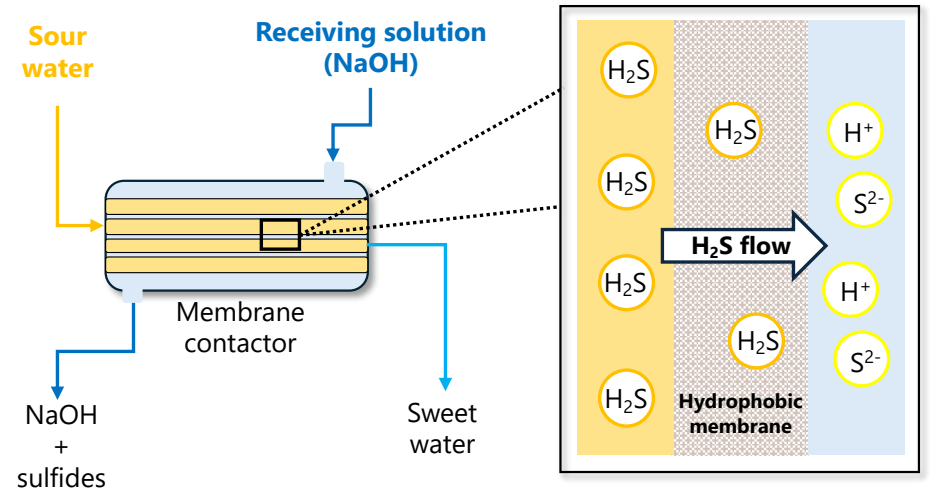
Process Description

MC are a gas-liquid separation technology used to remove dissolved gases from liquid stream. One potential application of MC is to remove hydrogen sulfide (H_2S) from sour water.

In such application, sour water flows on one side of a hydrophobic membrane, while a caustic (e.g., sodium hydroxide, NaOH) receiving solution flows on the opposite side. Under acidic conditions, dissolved sulfide is converted to H_2S, which diffuses across the membrane and is captured in the caustic solution as stable sulfide species. The membrane prevents liquid water from passing through while enabling selective transfer of H_2S.

Due to their modular design, compact footprint, and ability to selectively remove volatile compounds, MC represent an alternative to conventional sour water treatment processes. The sulfide-rich receiving solution can be treated by ultraviolet-oxidation and aeration to convert sulfides into sulfate and thiosulfate, facilitating safe reuse or disposal.

Process Schematic



Publications

- Application of membrane contactors to remove hydrogen sulfide from sour water (Link)
- The effect of Hydrogen sulfide oxidation with ultraviolet light and aeration on sour water treatment via membrane contactors (Link)

Patent

Method of Removing Hydrogen Sulfide from Water (Link)

For further information, please contact us at email: GWSC@conocophillips.com