Research Article

Comparison of Various Alkaline Solutions for $\text{H}_2\text{S}/\text{CO}_2$-Selective Absorption Applied to Biogas Purification

Biogas is a common renewable energy resource. A very important stage of biogas upgrading, studied in the present work, is its purification from $\text{H}_2\text{S}$ traces. The selective absorption of $\text{H}_2\text{S}$ and $\text{CO}_2$ into oxido-alkaline solutions containing hydrogen peroxide and into amine solutions was compared by performing absorption test runs in a cables-bundle scrubber at 293.15 K and atmospheric pressure. The absorption rate and selectivity for $\text{H}_2\text{S}$ over $\text{CO}_2$ were determined for various solute partial pressures, different alkaline absorbents and hydrogen peroxide concentrations in the scrubbing liquid, and different pH values. Higher $\text{H}_2\text{S}$-selective absorption performances with oxido-alkaline solutions than with amine solutions could be observed provided that the solution is at a low pH value (9.5) and contains a sufficient hydrogen peroxide concentration.

Keywords: Absorption, Biogas, Carbon dioxide, Hydrogen peroxide, Hydrogen sulfide

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