

The Solubility of Hydrogen Sulfide and Carbon Dioxide in Propylene Carbonate

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Over the years, a number of techniques have been proposed to remove acid gas components (H₂S and CO₂) from gas streams. One technique is to use propylene carbonate to strip these components from the gas stream. There is a large amount of published solubility data for carbon dioxide and hydrogen sulfide in these solvents and the development and validation of any vapor-liquid equilibrium model requires a thorough knowledge and review of the available data. With this in mind, an exhaustive review of the solubility data of hydrogen sulfide and carbon dioxide in propylene carbonate available in the literature was performed. To complement and extend the existing data set, new measurements of the solubility of hydrogen sulfide in propylene carbonate were performed.

All of the available data for the binary systems (H₂S + propylene carbonate) and (CO₂ + propylene carbonate) were correlated with the Peng-Robinson equation of state and values of the binary interaction parameters were obtained. Using the expressions relating the binary interaction parameters with the parameters of the Krichevsky-Illinskaya equation, Henry's coefficients for the solutes in propylene carbonate were calculated. The new data and the modeling results will be compared with the previously reported Henry's law coefficients. Comments on the individual data sets and recommendations for future measurements will be made.