



# Research Report

## RR-209

### Solubility of H<sub>2</sub>S and CO<sub>2</sub> in EG and TEG

**Project 975-8**



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## Foreword

The Gas Processors Association (GPA) initiated Project 975 to aid in updating key industry resources, specifically the 13th Edition of the GPSA Engineering Data Book. Sub project 8 (Project 975-8) was undertaken specifically to review the content of previously published GPA Research Reports (specifically RRs 183 and 189) as well as other trusted and available published data in the literature on CO<sub>2</sub> and/or H<sub>2</sub>S solubility in glycols (EG and TEG) at conditions pertinent to gas processing industry operations.

Previous projects sponsored by GPA resulted in the production of data describing the vapor-liquid and vapor-liquid-liquid equilibria of systems containing hydrocarbons, acid gas components (CO<sub>2</sub> and H<sub>2</sub>S), glycol solutions (both pure and aqueous EG and TEG solutions). These data can be used to predict the absorption of these acid gas components into the solvent, which would occur during dehydration of gases, and the subsequent desorption of them during regeneration or flash of the solvent. Having the capability to predict the solubility of these acid gas components in glycol solutions is important to allow operators the ability to estimate the amount of CO<sub>2</sub> and/or H<sub>2</sub>S emissions to the atmosphere (often a regulatory and safety issue), and in the design of a glycol dehydration unit (i.e. corrosion issues and materials selection).

The ultimate goal was to summarize the data into forms that would be convenient for use in quick and approximate manual calculations such as figures, descriptive text, and where feasible equations that more accurately represent the data over a wider range of conditions yet were simple enough for suitable inclusion into the Data Book. This project focused on an update to Section 20 (Dehydration), specifically an update to Figure 20-76 from the 12<sup>th</sup> Edition and supporting text. Applicability of the data, including expected error and range of use, were included to help the user better understand the limitations of this using this data to various applications. The overall intent was to make the subject data more easily interpreted and applied by user company engineers and operators with guidance to assist users of the Data Book to apply the data and correlations to real design and operating problems.