

## **Solubility of H<sub>2</sub>S and CO<sub>2</sub> in Bitumen and Cracked Products**

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The decline in conventional crude oil reserves has led to an increasing interest in the recovery and processing of shale oil, coal liquids and oil-sands bitumens. The design of reservoir production systems, reformers, hydrocrackers, hydrotreaters and scrubbing units requires accurate knowledge of the solubilities of light hydrocarbons and non-hydrocarbons such as H<sub>2</sub>, CO<sub>2</sub>, and H<sub>2</sub>S in these hydrocarbon systems. The hydrocarbon mixtures in these processes are quite different in chemical structure than conventional petroleum mixtures. Bitumens differ from normal crude oils in that they contain mononuclear and polynuclear aromatics, naphthenes, high boiling paraffins and ring compounds containing N, S or O. The solubility of hydrogen sulfide and carbon dioxide in Athabasca bitumen and cracked products has been measured at temperatures in the range (50 to 300)°C at pressures up to 6.4 MPa. The new data expand upon the limited data available in the open literature for the solubility of CO<sub>2</sub> and H<sub>2</sub>S in the hydrocarbon systems. The new data were correlated with the Peng-Robinson equation of state. The experimental techniques, results and the ability of the Peng-Robinson equation of state to correlate the new data will be discussed.