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# Thermodynamic Modeling of Scale (Calcite, Barite, Anhydrite and Gypsum) Deposition from Brine

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**Abstract** – Solid – liquid equilibrium (SLE) behaviour of four scales of Calcite, Barite, Anhydrite and Gypsum in water has been investigated in the ranges of 0-250 °C and 1-1500 bar. Solubility of the abovementioned scales in water is calculated considering Saturation Index (SI) model, and Pitzer's theory is applied to calculate the activity coefficients. Good agreement has been achieved between the model results and the literature data.

To identify the best activity coefficient model among e-NRTL, e-UNIQUAC and Pitzer approaches, activity coefficients of the above said chemicals have been calculated at different thermodynamic conditions with respect to the available data collected from the literature and the results have been compared to the experimental data. It is shown that the most precise model is Pitzer's one and the second accurate model is e-UNIQUAC.

**Keywords** – Solubility; Saturation Index (SI); Scale Deposition; Pitzer; e-NRTL; e-UNIQUAC.

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