عنوان مقاله:

Modeling and Parametric Analysis of the Rate of Asphaltene Particle Deposition from Oil Stream

محل انتشار:

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خلاصه مقاله:

Deposition of asphaltenes, waxes, sand, etc. on inner walls of oil wells and pipelines causes arterial blockage or significant production loss in these conduits. The major mechanism(s) under which asphaltene particles deposit along oil stream are still under investigation as an active research topic in the literature. Placing the asphaltene deposition within a more general context of particle deposition during turbulent flow, a mathematical model accounting for the both diffusional and inertial mechanisms as well as particle re-entrainment process for prediction of asphaltene deposition rate was proposed. Model predictions were compared and verified with two sound experimental data available in the literature to evaluate the model's performance. A parametric study was done using the validated model in order to understand the effect of the asphaltene particle size, flow velocity and oil viscosity on the magnitude of asphaltene deposition rate. Based on result of the study, it found that increasing the oil velocity causes more drag force on wall's inner surface, consequently, particles tend to transport away from the surface and rate of asphaltene deposition decreased. In addition, the analysis shows that lighter petroleum fluid is more prone for asphaltene deposition problem.

کلمات کلیدی:

Asphaltene, Particle, Deposition, Parametric Analysis

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