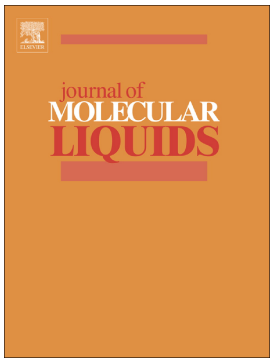

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Prediction of sulfur solubility in supercritical sour gases using grey wolf optimizer-based support vector machine

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Abstract: Accurate knowledge of the solubility of sulfur in supercritical sour gas is essential in highly effective development of sour gas reservoirs. However, it is well-acknowledged that experimental measurements are expensive, time-consuming and cumbersome especially due to the highly nocuous H_2S. As a direct consequence, a new meta-heuristic technique namely grey wolf optimizer-based support vector machine (GWO-SVM) was proposed to accurate prediction of the sulfur solubility in supercritical sour gases. The proposed GWO-SVM model considered the reservoir temperature, pressure and the mole fraction of methane, hydrogen sulfide and carbon dioxide as input parameters and the sulfur solubility as target parameter on the basis of gray correlation analysis. The accuracy and reliability of the presented model were evaluated through 170 data sets accessible to the literature and compared with three empirical correlations (Guo-Wang, Hu et al, Chrastil correlation) reported in previous

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