

Artificial Intelligence Methods in Estimating the Minimum Miscibility Pressure Required for Gas Flooding

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Abstract : Utilizing the capabilities of Data Mining and Artificial Intelligence in the prediction of the minimum miscibility pressure (MMP) required for multi-contact miscible (MCM) displacement of reservoir petroleum by hydrocarbon gas flooding using Fuzzy Logic models and Artificial Neural Network models will help a lot in giving accurate results. The factors affecting the (MMP) as it is proved from the literature and from the dataset are as follows: XC2-6: Intermediate composition in the oil-containing C2-6, CO₂ and H₂S, in mole %, XC1: Amount of methane in the oil (%), T: Temperature (°C), MwC7+: Molecular weight of C7+ (g/mol), YC2+: Mole percent of C2+ composition in injected gas (%), MwC2+: Molecular weight of C2+ in injected gas. Fuzzy Logic and Neural Networks have been used widely in prediction and classification, with relatively high accuracy, in different fields of study. It is well known that the Fuzzy Inference system can handle uncertainty within the inputs such as in our case. The results of this work showed that our proposed models perform better with higher performance indices than other empirical correlations.

Keywords : MMP, gas flooding, artificial intelligence, correlation

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