

عنوان مقاله:

Use of Neural Network for Prediction of Minimum Miscibility Pressure

محل انتشار:

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خلاصه مقاله:

The aim of this study is to develop a neural network model to calculate the minimum miscibility pressure (MMP). So far, different MMP correlations and models regarding the kind of injection gas and the mechanism of miscibility have been proposed. In this article, empirical and neural network models introduced for predicting MMP regarding the composition of the injected gas and the condition in which miscible displacement is done have been studied. Experimental data from Iran and other countries with different injection gases carried out by slim-tube test have been used to obtain a new MMP correlation that is suitable to be applied to oil reservoirs. Neural network correlation has been developed to estimate the gas-oil MMP. In developing this correlation, the neural network of Matlab toolbox used in our work that has been modified to account for various component gases in the gas stream. The correlation estimates the MMP as a function of the injected gas solvency in the oil. The solvency, in turn, is related to critical properties of the injected gas. By applying the new MMP correlation, one can determine minimum miscibility pressure of these reservoirs with more accuracy and within a shorter period of time. The predicted MMPs are compared with the experimental results reported from the above reservoirs. The sensitivity analysis is done and consequently their error percentage are determined and reported. Therefore, a suitable model with less error and more precision is introduced. It is shown that the results obtained from neural network MMP model are more accurate compared to common empirical correlations reported in literature.

کلمات کلیدی:

minimum miscibility pressure, neural network, empirical correlation

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