CO_2-Oil Minimum Miscibility Pressure Predicting Model

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The CO_2-oil minimum miscibility pressure (MMP) is an important parameter for screening and selecting reservoirs for CO_2 injection projects. For the highest recovery, a candidate reservoir must be capable of withstanding an average reservoir pressure greater than the CO_2-MMP. Knowledge of the CO_2-oil MMP is also important when selecting a model to predict or simulate reservoir performance as a result of CO_2 injection. This paper, presents a new alternating conditional expectation "ACE" - based model for estimating CO_2-oil MMP.

The ACE algorithm, estimate the optimal transformations that maximizes the correlation between the transformed dependent variable "CO_2-oil MMP" and the sum of the transformed independent variables, that represent reservoir temperature, and different components of oil composition. Predicted values of the CO_2-oil MMP from the developed ACE-based model were compared with the experimental and calculated values from the most common correlations, which reported in the literature for CO_2-oil MMP prediction. The results displayed that the ACE-based model is superior to other commonly used correlations. Regarding to other correlations, the ACE-based model yielded the highest correlation coefficient (0.9878), the lowest average relative error (0.7428 %), and the lowest standard deviation of error (1.2265).