

Prediction of Oil Recovery Factor Using Artificial Neural Network

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Abstract : The determination of Recovery Factor is of great importance to the reservoir engineer since it relates reserves to the initial oil in place. Reserves are the producible portion of reservoirs and give an indication of the profitability of a field Development. The core objective of this project is to develop an artificial neural network model using selected reservoir data to predict Recovery Factors (RF) of hydrocarbon reservoirs and compare the model with a couple of the existing correlations. The type of Artificial Neural Network model developed was the Single Layer Feed Forward Network. MATLAB was used as the network simulator and the network was trained using the supervised learning method, Afterwards, the network was tested with input data never seen by the network. The results of the predicted values of the recovery factors of the Artificial Neural Network Model, API Correlation for water drive reservoirs (Sands and Sandstones) and Guthrie and Greenberger Correlation Equation were obtained and compared. It was noted that the coefficient of correlation of the Artificial Neural Network Model was higher than the coefficient of correlations of the other two correlation equations, thus making it a more accurate prediction tool. The Artificial Neural Network, because of its accurate prediction ability is helpful in the correct prediction of hydrocarbon reservoir factors. Artificial Neural Network could be applied in the prediction of other Petroleum Engineering parameters because it is able to recognise complex patterns of data set and establish a relationship between them.

Keywords : recovery factor, reservoir, reserves, artificial neural network, hydrocarbon, MATLAB, API, Guthrie, Greenberger

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