A Modern Method for Calculating Pore Volume Compressibility

Compressibility is the parameter that quantifies the relationship between the pressure exerted on a body and the resulting change in its volume. The compressibility of a reservoir at different pressures is an important parameter affecting reserve forecasts and field development strategies. Although several studies have been performed on prediction of pore volume compressibility of different rock types but the developed correlations are not accurate enough and some of these correlations are presented mainly in graphical form, thus it is difficult to use them within general computer packages for simulation and design. Also these correlations are based on foreign country's reservoirs and this prove the need to set correlations for Iranian reservoirs. Artificial intelligences Neuro-Fuzzy Inference System (ANFIS), are powerful tools in the hand of petroleum and gas engineers for proper and professional management of hydrocarbon as sets. The purpose of this paper is to present a comprehensive neural network model for predicting pore volume compressibility. 33 experimental data points have been collected from 3 different types of sandstone reservoir rock from one of Iranian oil reservoir. For designing the networks, the standard feed forward back propagation algorithm was used. The results show good accuracy of this modeling compare to Hall and Newman's answer from correlation.

Keywords: compressibility, ANN, feed forward back propagation

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