

Development the models of oil formation volume factor using artificial neural networks and fuzzy logic models

Fahd Saeed Alakbari



Univeristi Teknologi Petronas. (UTP), Malaysia.

Abstract

The oil formation volume factor with high accuracy method is a key role in the petroleum industry due to the wide use of it in the petroleum industry. It is readily obtained from laboratory PVT measurements or may be calculated from correlations such as Vasquez. Nevertheless, these measurements are either not available, or very costly to require. Thus, there is an essential need for a reliable method for obtaining the oil formation volume factor.

The aim of this paper is predicting the oil formation volume factor using Artificial Neural Networks (ANN) and Fuzzy Logic (FL) tools. It is worth noticing that a data set consisting 800 of laboratory measurements on oil formation volume factor was gathered from different published resources. The paper also will use the current available models presented in the literature for predicting the oil formation volume factor and compare the average percent error of these models with the new base models.

The results obtained depicted that new models were able to find the oil formation volume factor with higher accuracy than the current models for predicting oil formation volume factor. It is conspicuous results that the Artificial Neural Networks (ANN) model with coefficient 0.994 and Fuzzy Logic (FL) with coefficient 0.9993 provide the oil formation volume factor. The new developed models from the ANN and FL models outperformed the prior models for the oil formation volume factor. It is obviously observed that the new models can be used to predict the oil formation volume factor with a high accuracy as compared with the other models used to be calculated from correlations such as Vasquez and Beggs.

Biography

Fahd Saeed Alakbari Currently, He is Ph.D. student and work as graduate assistant in UNIVERSITI TEKNOLOGI PETRONAS (UTP), Malaysia. I studied master's degree in petroleum engineering in King Fahd University of Petroleum & Minerals, Saudi Arabia (2017) and bachelor's degree in petroleum engineering in Hadramout University of Science & Technology, Yemen (2012). I have two diplomas in computer engineering and application in Alrowd Institute and Information Technology Institute, Yemen (2004). My background includes petroleum engineering as a drilling, production and reservoir simulation. Most recently, I worked on the KFUPM Labs as a researcher, where my responsibilities included handling mud drilling properties, cementing, sag test of the drilling fluid and remove drilling fluid. I have a good knowledge and experience in reservoir simulation software programs such as petrel, CMG and Matlab and I have more experience in petroleum Artificial Intelligence Techniques such as back propagation and fuzzy logic tool. I have also a good knowledge and experience in advanced well stimulation such as formation damage, sandstone acidizing and carbonate acidizing. I know very well about safety to achieve a work safely in the labs. Previously, I worked as a petroleum engineer in the Calvalley Company in Yemen. In addition to this experience, I worked in safety system, drilling operations, labs analysis, water injection, chemical injection, relief system, flare system, CPF, ESDS, separators, heaters, gas knockout, air compressors, oil export, pumps and types of ESP. I worked in oil/water emulsion breaking and I have a good knowledge about demulsifiers. I know a lot about corrosion inhibitors: principles, mechanisms, application, and corrosion in the petroleum industry. I have also a good knowledge in H₂S scavengers.



[2nd International Conference on Petro Chemical Engineering and Natural Resources | February 10-11, 2021](#)

Citation: Fahd Saeed Alakbari ,Development the models of oil Formation volume factor using artificial neural networks and fuzzy logic models. Petro Chemistry 2021, 2nd International Conference on Petro Chemical Engineering and Natural Resources, February 10-11, 2021, 04