سیویلیکا - ناشر تخصصی مقالات کنفرانس ها و ژورنال ها
گواهی ثبت مقاله در سیویلیکا
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عنوان مقاله:

(Prediction of Condensate Gas Ratio (CGR) Using an Artificial Neural Network (ANN

محل انتشار:

هفتمین کنگره ملی مهندسی شیمی (سال: 1390)

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خلاصه مقاله:

Added values to project economy from condensate sales and gas deliverability loss due to condensate blockage are the main differences between gas condensate and dry gas reservoirs. Toestimate the added value, one needs to obtain condensate to gas ratio (CGR); however, this needsspecial PVT experimental study and field tests. In the absence of experimental studies during early period of field exploration, techniques which correlate such a parameter would be of interest forengineers. Artificial Neural Network (ANN) is a multi-dimensional correlation including a large number ofparameters, relating input and output data sets. Compared with an empirical correlation, an ANN model can accept more information substantially as input to the model, thereby, improving theaccuracy of the predictions significantly and reducing the ambiguity of the relationship betweeninput and output. Moreover, ANNs are fast-responding systems. Once the model has been trained , predictions on unknown fluids are obtained by direct and rapid calculations, withoutiterative computations or tuning. This paper demonstrates how ANN predicts the CGR of a gas condensate reservoir with minimumand easily accessible parameters. In development stage of the ANN model, a large number of data covering wide range of gas condensate properties and reservoir temperature were collected fromthe literature and National Iranian oil Company (NIOC) data bank. The qualified data set wereused to train the model. The predictive ability of the model was tested using experimental data sets that were not used during the training stage. The results are in good agreement with theexperimentally reported data. The proposed model exhibits sensitivity to several parametersincluding reservoir temperature, gas molecular weight and dew point pressure. The network has the R - square of 0.9881, 0.9837 and 0.9821 for training, validation and test, respectively.

کلمات کلیدی:

Petroleum engineering, Reservoir engineering, Condensate gas reservoirs, Condensate gas ratio, CGR, Artificial intelligence, Artificial neural network, ANN

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