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A New Approach to Evaluate Organic Geochemistry Parameters by Geostatistics Methods: A Case Study from Western Australia

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Abstract

Evaluation of geochemical data is essential in unconventional shale resources. But to measure this parameter, expensive and time-consuming geochemical experiments are carried out on few cuttings or core samples. Indirect method, such as petrophysical approach, can provide a fast, convenient and cost effective means for geochemical data estimation from well logs. Among the publically available approaches, the Δ LogR method is a popular one in conventional source rock evaluation for hydrocarbon exploration. In this study, two methods (intelligent and geostatistics) are used for estimation and simulation of organic geochemical parameters in the Western Australia. For estimation by neural network (NN); petrophysical logs were used as inputs and S1, S2, S3, TOC data, derived from geochemical analysis, were considered as output of the models. For simulation, the well derived geochemical data were simulated by sequential Gaussian simulation (SGS). The above methodologies are illustrated by using a set of real data from a petroleum exploratory well in the Western Australia. These results showed accuracy of the method which can be readily used for geochemical evaluation.

Keyword: Organic geochemistry, intelligent, geostatistics, petrophysical logs, neural network, SGS

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