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Evaluation Methods for Coalbed Methane Reservoirs Using Log Data and Their Application to the Eastern Hollow, Liaohe Basin, China

In this paper, based on conventional well logging data (e.g., density log, dc-resistivity log, acoustical log, nuclear log and so on), coalbed core analyzing data and other related geological data in the eastern hollow of Liaohe Basin, China, a coalbed identification method of fuzzy pattern recognition is proposed from composite conventional well log information, coal reflectivity and coal rank are evaluated by using statistical regression and, two formulas of calculating content of coalbed methane are presented by Langmuir's equation and sorption isotherm of coalbed methane from coal components, which may be calculated from the conventional well logging data. The coefficients of these two formulas may be determined by the statistical regression method. Formulas of calculating porosity and permeability of fractures for coalbed are deduced using coalbed volume model of double pore structure and Darcy's law.

The evaluation methods have been applied to the processing and interpretation of the real well log data from the eastern hollow of Liaohe Basin, China. Our results about coalbed identification and reservoir parameters from well log information are in close agreement with the ones from coal core sample data and exploration and development data in this area.