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A new approach of gas saturation field modelling in tarim tight sandstone reservoir

Zhaolong L I U, Ailin J I A and Yongzhong Zhang

PetroChina Research Institute of Petroleum Exploration & Development, China

Tarim Tight Sandstone Reservoir has the complex pore texture and gas-water relation with the tight matrix and developed fractures. Evaluation results are not as good as expected using the classical Archie equation, which indicate low coincidence rate for the water or gas layer recognition at the reservoir bottom especially. In this paper, we analysis the key control factors of reservoir fluid and gas-water distribution, calculate the gas saturation of single well in divided three reservoir categories based on the microscopic formation dynamics theory, and model the gas saturation field of Tarim sandstone reservoir. Calculated gas saturation results coincide to the ones in the tested zone and gas recognition results, which could interpret some water zones at high parts in some wells. Irreducible water saturation is mainly affected by the clay content, while movable water saturation is mainly affected by the gas charging power (gas column height) and pore texture. From gas column vs. movable water saturation curve, the best reservoir has the characteristics of mainly large pore and concave-shape curves in three reservoir categories. This new approach could predict gas saturation distribution more accurately in different geological structures, which shows significance in researching water-production reason, development index optimization and reservoir stimulation.

Biography

Zhaolong L I U has completed his Master Degree at Norwegian University of Science and Technology (NTNU). He is currently working in PetroChina Research Institute of Petroleum Exploration & Development. His research interests include reserves evaluation, tight sandstone reservoir characterization, 3D geological modelling, fracture description and prediction.

liuzhaol69@petrochina.com.cn

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