

Movable oil and its controlling factors in Tight Sandstone oil

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Tight oil in place (geologic reserves) in China has been estimated over 10 billion tons and available producible reserves have been challenged defined. Several efficient ways, including perfecting QCM-D to evaluate adsorption ratio per unit in subsurface cores, applying Mercury injection capillary pressure (MICP) and nitrogen adsorption to define the lower oily limit and the effective specific surface area, and combining oil testing results in confining cores, are utilized to evaluate the movable oil at Chang7 Triassic Yanchang Formation in Ordos Basin. Conclusions from these results indicate that the thickness of oil adsorbed on tight sandstone surface has been estimated 15.6nm and the intensity around 13mg/m², and the lower oily limit has been assessed for around 20nm and the effective specific surface area around 1m²/g, and the porosity has been reckoned for 6~10% and the ratio of free oil around 14.3~48.6%. All these results are comparable with the NMR experiments. Several factors controlling the amounts of the movable oil in tight sandstone include the crude oil density and viscosity, effective specific surface area(S), effective porosity volume (ϕ) and mineral constitutes. Targeting for specific region and layer, we are proposing the amounts of the movable oil are parametrically controlled by pore surface area/effective porosity volume (S/ ϕ).