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Nano-geology and unconventional oil and gas

Yiwen Ju¹, Yan Sun²

¹ Key Laboratory of Computational Geodynamics, Chinese Academy of Sciences, University of Chinese Academy of Sciences, Beijing 100049

² Nanjing University, Nanjing, 210093

The unique characteristics related to the nano-particles and nano-pores may be significant for formation, evolution and accumulation of rocks in the geological process^[1-5]. Nano-geology and the related metallogenic and accumulation are currently research frontier and hot topics in nanoscience and geology. Nanotechnology will bring a new leap forward for the development of geology in the 21st century, some breakthrough in the ultra-microscopic scale may be came. Although nano-geological studies by the previous researcher have been obtained to a certain degree, however, the theoretical system of nano geology seems still inadequate, and a comprehensive understanding of nano accumulation has not been elucidated. Especially as remarkable development has been achieved in unconventional oil and gas industry, the unconventional reservoir structure evolution in nanometer effects and mechanisms of hydrocarbon accumulation and penetration are urgent to settle. Based on the nano earth sciences in domestic and overseas, the research intended to a more micro level, deeply revealing of unconventional reservoirs structure evolution in nano scale: Nano mineral and organic matter in surface structure and reactivity issue; Unconventional reservoir structure of micro and nano-scale tectonic deformation; Micro-nano process and mechanism of deformation; the flow mechanism of unconventional oil and gas reservoirs under restrict of nano pores enrichment; The formation of oil and gas in rich region and reservoir stimulation issues, focus on and settle the key issues and frontier in unconventional oil and gas field, thus enriching and developing nano geological theory and methods, and provide an important scientific foundation for the exploration and development of energy and mineral resources.

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