Citation: SUN Zhongliang, LI Zhiming, SHEN Baojian, ZHU Qingmin, LI Chuxiong. NMR technology in reservoir evaluation for shale oil and gas[J]. *PETROLEUM GEOLOGY & EXPERIMENT*, 2022, 44(5): 930-940. doi: 10.11781/sysydz202205930 (http://dx.doi.org/10.11781/sysydz202205930)

PDF(8860 KB)

NMR technology in reservoir evaluation for shale oil and gas

doi: 10.11781/sysydz202205930 (https://doi.org/10.11781/sysydz202205930)

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Since the development of unconventional oil and gas business, Nuclear Magnetic Resonance (NMR) technology has been gradually applied in the evaluation for unconventional reservoirs due to the merits such as nondestructive, sensitive and fast, this technology has become one of the important methods in shale oil and gas reservoir evaluation. Therefore, based on the experimental principle of NMR technology, this paper focuses on the applications of NMR technology in the full-scale integrated characterization of pore and fracture distribution, characterization of shale porosity, pore wettability, fluid mobility and fluid classification, etc. In addition, the applications of NMR in describing water migration, methane adsorption and desorption, carbon dioxide displacement and other fluid behaviors, obtaining organic matter information, oil shale interface area, determining organic pores and inorganic pores, analyzing pore connectivity, and obtaining information about high-viscosity asphalt and kerogen are also briefly reviewed. Finally, the shortcomings of NMR and the development trend of NMR in shale reservoir evaluation are analyzed.

Keywords: Nuclear Magnetic Resonance (NMR), shale reservoir, distribution of pores and cracks, porosity, wettability, fluid mobility

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(http://www.sysydz.net:80/en/article/2022/5)
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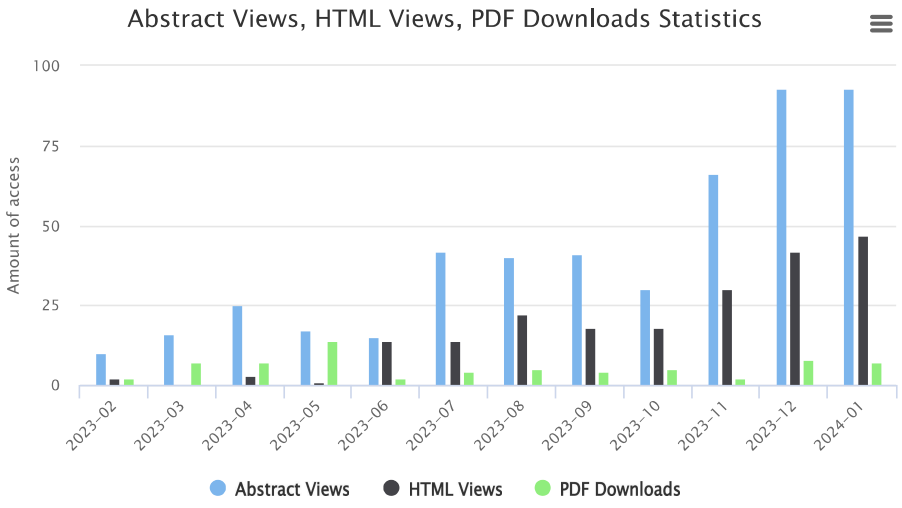

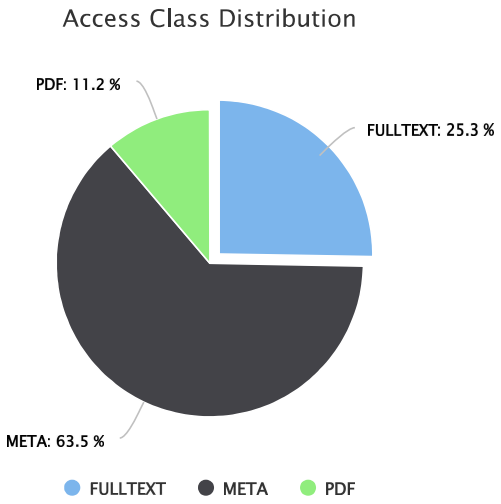

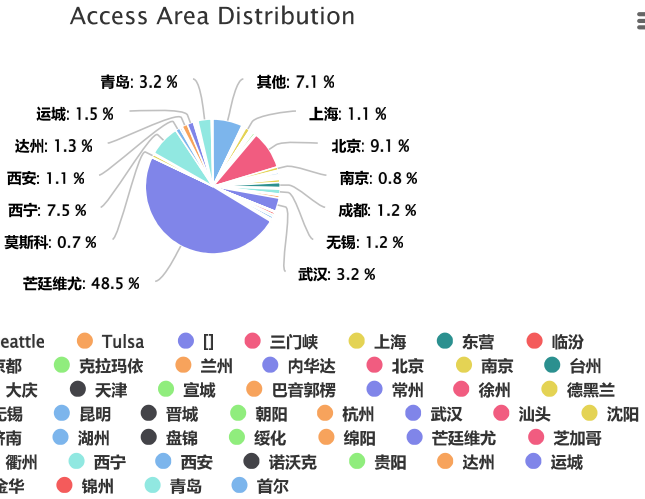

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