

EVOLUTION AND THE INFLUENCE FACTORS OF ORGANIC PORE STRUCTURE OF THE TRIASSIC SHALE IN ORDOS BASIN, CHINA

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Organic nano-pore is not only important part of shale pore system, but also an important factor that affect shale adsorption capacity. Shale samples from the Triassic, Ordos Basin were designed and a series of experiments were carried out to study the evolution and influence factors of the organic nano-pore structure to better estimate the gas content.

Ten samples from different depths were chose, with total organic carbon(TOC) content ranging from 2.17% to 13.1% , Rock-Eval Tmax values from 410°C to 458°C and S₁from 3.88 mg/g to 7.65 mg/g. Two pieces(about 1×1 cm) were selected from each sample for argon-ion milling and/or field emission scanning electron microscopy(FE-SEM) observation, and collected images under different magnifications. Chloroform extraction(imitate liquid hydrocarbon expulsion) or heated on constant temperature 300°C(imitate gaseity hydrocarbon expulsion) was carried out separately on random one, then collected FE-SEM images. Image recognition system was used to quantitative analyze organic pore structures, such as size, amount, shape, porosity, et al. These data were used to analyze organic nano-pore characteristic in follows aspects: different depth, same TOC with different Tmax, different TOC contents, different organic matter occurrence modes, different soluble organic matter contents, before and after treatment and different ways of treatments.

This work will clarify the evolution characteristic of organic pore structure of raw sample, and the impact of depth (the thermal evolution extent), TOC content, occurrence of organic matter, soluble organic matter content and state of hydrocarbon expulsion (liquid or gaseity) on organic pore structure.