

Characteristics and effectiveness evaluation method of marine continental transitional shale reservoir

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Abstract: In order to solve the problem of poor selection or lack of basis for effective evaluation of shale reservoir, the Carboniferous Permian transitional facies shale in Ordos Basin was selected as the research object, and the abundance, type, maturity and quality of organic matter in shale were analyzed by means of organic element analysis, coal petrography optics, scanning electron microscope, X-ray diffraction, physical property test and gas adsorption. The core thin section scanning electron microscope multi-scale characterization method was used to test and analyze the reservoir evaluation parameters such as mineral composition and porosity and permeability characteristics. The results show that: the mud shale of the transitional facies between sea and land in Ordos Basin is deeply buried, with thin single layer thickness; the abundance of organic matter (TOC content is 3.3% on average); the kerogen type of organic matter is mainly type II₂ and type III, with gas generation tendency; the vitrinite reflectance (Ro) is 1.03% on average, reaching the mature stage, entering the hydrocarbon generation threshold; the content of brittle minerals such as quartz and feldspar is low, and the clay is rich. High mineral content (average 51%) is not conducive to reservoir fracturing; at the same time, many types of pores and fractures such as dissolution pores and micro fractures are developed, which is conducive to shale gas preservation. Based on the above reservoir parameters, the comprehensive evaluation of the mud shale reservoir of the transitional facies between sea and land in Ordos Basin has good reservoir forming conditions and great hydrocarbon generation potential and development prospect.