



The relationship between tectonic evolution and oil-cracking gas accumulation in late stage for marine superimposed basins

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The marine superimposed basins are rich in oil-cracking gas resources. Their hydrocarbon accumulation processes of late stage have experienced early paleo-oil reservoir accumulation period and late oil-cracking gas period, which are apparently controlled by tectonic evolution. Studying the relationship between tectonic evolution and oil-cracking gas accumulation of late stage has great significance to guide the exploration of oil-cracking gas reservoirs. Taking the relationship between tectonic evolution and oil-cracking gas accumulation of late stage for the Shunan area in the Sichuan Basin as example, through the analysis on the response of structural evolution to deposition, the relationship between hydrocarbon generation process of ancient source rocks, initial hydrocarbon accumulation, oil cracking and gas accumulation of late stage was studied. The source rocks of the Cambrian Qiongzhusi Fm in the Shunan area experienced three periods of hydrocarbon generation and two periods of hydrocarbon generation lag. During the large-scale tectonic uplift and thick erosion event in the periods of the Caledonian and the Hercynian, the source rocks of the Qiongzhusi Fm had experienced two times of hydrocarbon generation and two times of hydrocarbon generation lag. The overlying super-thick strata deposited during the Indosinian and Yanshan periods made the source rocks of the Qiongzhusi Fm continuously generate oil and gas. The crude oil in the paleo-reservoir of the Longwangmiao Fm had experienced one time of oil-cracking gas process. After the Indo-Chinese epoch, the burial depth of the Triassic strata was deep enough to promote the crude oil in the paleo-reservoir of the Longwangmiao Fm to be cracked gas. This process continued to the late Yanshan period, providing sufficient gas source. The following five conclusions are obtained: The tectonic and depositional evolution of the marine superimposed basins controlled the development of the basic hydrocarbon geology conditions; The tectonic and depositional evolution controlled the hydrocarbon generation process of the ancient source rocks; The tectonic and depositional evolution controlled the development of the paleo-structures, accumulation and preservation of the paleo-oil reservoirs; The tectonic and depositional evolution controlled the crude oil cracking of paleo-reservoirs and their accumulation in the late stage; The research idea on oil-cracking gas accumulation of late stage of ancient marine source rocks was established, which could provide references for the paleo-oil reservoirs of the same type in order to expand the exploration scopes of oil-cracking gas reservoirs.