Effect of gypsum-salt rocks on hydrocarbon accumulation in marine carbonate strata, China

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It has been proved by the oil and gas exploration practice in carbonate basin that gypsum-salt rocks have important influence on the hydrocarbon accumulation[1,2]. Therefore, the hydrocarbon generation mechanism, reservoir formation and preservation, hydrocarbon accumulation on the condition of gypsum and salt rock sedimentary environment are discussed respectively.

Results show that from the perspective of hydrocarbon generation, evaporative tidal flat, lagoon environment with high quality source rocks associated, can form high quality hydrocarbon source rocks frequently. The gypsum and salt rock with kerogen simulation experiment results confirm in gypsum and salt environment have a promoting effect on the hydrocarbon generation of source rock.

The potential of gas contents are increased by the gypsum -salt with carbonate association. From the perspective of carbonate reservoir formation mechanism, the dolomite reservoir types and characteristics are determined by analysis of core observation and thin section. Metrical water dissolution simulation is the main reason of dolomite on evaporative tidal flat was confirmed. The moderate burial environment dissolution is the important reasons for the formation of dolomite reservoirs.

From the perspective of hydrocarbon accumulation, the brittle-plastic gypsum and salt rock simulations revealed that buried deep, high temperature and pressure environment make the property in rocks occur plastic conversion, can effectively block the oil and gas or be a good conduct for oil and gas fluid. The movement on gypsum and salt rocks also can form good fluid migration channel. Tectonic deformation physical simulation has also been revealed in the compressive tectonic environment, gypsum and salt on the uncoordinated deformation, the deep development of concealed trap effectively, can be used as an effective hydrocarbon accumulation unit.

[1] Zhao W Z, e*t al*. (2012) *Petroleum Exploration & Developmen*39(1):1-12.
[2] Jin Z J, e*t al*. (2012) *Oil& Gas Geology* 31(6):715-724.