

Multicyclically Superimposed Basins and Complex Petroleum Systems in China

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Long-distance-drifted micro-plates or medium-sized continental blocks that disconnected from Gondawana constitute basement of superimposed basins in China such as Tarim, Ordos and Sichuan Basin in which many large oil and gas fields have been discovered in recent years. These superimposed basins experienced multicyclic tectonic evolution and several stratigraphic sequences and combinations of source-reservoir-seal were formed relevantly. In these basins, there developed marine stratigraphic sequences during Paleozoic and terrestrial sediments during Mesozoic and Cenozoic. During the tectonic evolution, various styles of structure, regional unconformities and special lithofacies belts were developed and provide numerous structural and stratigraphic traps which are the important targets for hydrocarbon exploration. The complex petroleum systems originated from the unique tectonic evolution, sedimentation and thermal evolution of the superimposed basins. Source, reservoir, seal and trap constitute the four essential elements for hydrocarbon accumulation, and generation, migration, accumulation, dispersion and preservation constitute five essential processes for formation of hydrocarbon pools. Tarim Basin is a typical example of superimposed basins which possess complex petroleum systems. Three hydrocarbon areas i. e. southwest depression, Arman depression and Kuchar depression are well developed and consisted of Cambrian-Ordovician, Carboniferous-Permian, Triassic-Jurassic sequences which provide sufficient oil and gas for the Kuchar and Southwest foreland structures (traps) within Shaya and Tazhong uplifts.