

Sedimentary Sequence and Paleoclimate of Neoproterozoic in Sichuan Basin

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Recently, abundant gas reservoirs are discovered in Sinian-Cambrian Fm. from the Anyue area in middle of Sichuan, while the exploration in other areas is quite unsatisfactory. The reason is that some questions are unclear about the paleotectonic background, depositional fillings, paleo-climate of Neoproterozoic by the low level of exploration and research. Its aim in this article is to understand the above questions. A integrated method is put forward, which is by the outcrop, cutting logging, and geochemical analysis, combination with heavy magnetic anomaly, navigation anomaly and seismic data. The results show that: ① The tectonic evolution of Neoproterozoic is complicated, which there are two stages of intracontinental rifting(Banxi Group and Lower Nanhuan), the depression stage(Upper Nanhuan)and the cratonic basin stage(Sinian system), and shows mostly the pattern of base and graben with the NE direction. ② The sedimentary sequence of Neoproterozoic from bottom to top shows mostly four sets of different lithofacies combination, including alluvial fan facies - neritic facies- carbonate platform facies - deep water facies, volcanic rock facies, glacial interglacial deposits and craton carbonate platform deposits, in which two sets of black carbonaceous shale with the high organic carbon and two sets of high quality carbonate reservoir. ③The study of paleoclimate shows that there are obvious differences between the Nanhua and the Sinian in the Sichuan Basin. There are a large number of tillites and dark argillaceous rock fillings in the Nanhua, thus its paleoclimate belongs to a warming and cooling cycle and a interglaciation to glaciation cycle. The paleoclimate of the Sinian changes from the early warm to the late dry heat because the Sinian was mainly composed of clastic sediments and dolomites containing evaporite.