

## **Barrier- Lagoon Sedimentary Model and Reservoir Distribution Regularity of Lower-Ordovician Majiagou Formation , Ordos Basin,China**

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Ordos basin is located in the centre of China. Lower Ordovician Majiagou Formation is composed of mixed evaporite and carbonate. It can be subdivided into six members in which Ma1, Ma3 and Ma5 are evaporate and Ma2, Ma4, Ma6 are carbonat.

During the Early-Ordovician, In the north of the basin is Yimeng old land, the other sides are uplift. The uplifts as barrier make a grate roll during the depositional of Majiagou Formation. During transgression to high sea level stage(Ma2, Ma4, Ma6), uplifts as underwater barriers lead to limitation of water exchanging between lagoon and exterior sea. During regression to low sea level stage(Ma1, Ma3, Ma5), lagoon is isolated partly and/or entirely by the uplifts.

Based on the research of paleo-structure, paleo-geography, paleo-hydrodynamic, paleo-climate as well as sedimentary facies Analysis of drilling wells of Majiagou Formation, Authors establish a new model: Barrier-lagoon sedimentary model. The model includes three phases. Phase one is that carbonate deposits in broad Barrier-lagoon during transgression to high sea level. phase two is that mixed carbonate /evaporate succession sediment in concentrated lagoon during regression, and phase three is that anhydrite and salt deposit in saline during low sea level. In phase one,the broad lagoon model is likely to Tuck's model. During phase two,because of fall of sea level, the barriers expose to atmosphere frequently. The lagoon is connected to exterior sea partly or only through sea channel. And the deposition in lagoon is involve into concentrated lagoon from broad lagoon. In this case, the barriers become flat facies, and the lagoon can be subdivided into lagoon margin flat and deep lagoon. In phase three, the barrier separate lagoon from exterior sea and make it become very salty. Anhydrite and salt are the main sediments.

Two main types of carbonate reservoir including the dolomite reservoir in relation to karstification and the crystalline dolomite reservoir in connection with dolomitization are discovered in this paper. The authors further analyze the carbonate reservoir distribution law within the mentioned model , and conclude that beach-flat of platform edge of phase one and lagoon margin flat of phase two are favourable for reservoir growth and point out that the reservoir of Majiagou Formation is karst type and is mainly distributed on the top of Ma5, Ma3 and Ma1. Anhydrite and salt of phase three are important seal rock.