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Sedimentary Characteristics and Models of Paleo-salt Lake During Paleocene and Eocene in the Jiangling Depression of Central China

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1 Sedimentary Characteristics of Paleo-salt Lake

In early sedimentary stages of Shashi formation, because of drought climate and the concentration of lake, a set of salt strata of hundreds of meters is developed in the tension background of Jiangling depression, which provides material basis for late formation of salt structure (Wang et al., 2011). In late Shashi formation, with the warming of climate, the increase of lake basis and the extension of sedimentation, a thick of chemical rock and mudstone is deposited including salt rock, anhydrite rock, glauberite, thenardite and carbonate etc., which deposited little sandstone (Wang et al., 2012). With the increasing of depth, the temperature and pressure that salt rock strata of lower Shashi formation experiences also increases, which provide certain temperature and pressure for the plastic flow of salt rock and the formation of salt tectonic.

In Xingouzui formation, two sedimentary facies of delta and lake is mainly developed. Controlled by palaeogeomorphology, mainly river and delta facies are developed along the fault zone of NW, N, NE Weiansi fracture-Jishansi fracture. From north to south side of Jingzhou anticlinal zone, delta front facies is mainly developed. The river-delta facies on the NW side is developed towards south east. On the slope side of Wancheng fault, foreset seismic reflection structure can be seen, which stands for delta facies. Delta fans are developed on fracture slope on the downthrown side of Wangchueng fault. The lake center is located in the middle west of Meikuiqiao depression and Cifusi depression, which mainly deposited mudstone and anhydrite-bearing mudstone of shallow-semi-deep lake facies.

2 Sedimentary Models of Paleo-salt Lake

Jiangling depression is located in Huaxia rift system, which is in persistent compensate sedimentation stages. Volcanic activity, deep source fluid (warm spring) and evaporate of ancient marine facies is developed in Paleogene (Liu, 2013). Based on the summary of potash forming theory at home and abroad, the paper proposes that Jiangling depression has rift potash forming condition with “small basin potash forming” and “rift basin potash forming” cognition. The major characteristics include: (1) The basin is persistent deposited, which is well closed and converged; (2) Deep source-volcanic activity provides rich mineral substance by warm spring; (3) Multi-phase ancient evaporate is deposited, weathered and replenished; (4) The collision of India plate and Eurasian plate causes the drought change of climate; (5) The common “monoclinic” and “duspan” form of the basin is favorable for the formation of “threshold” potash forming mechanism and the potash mineralization in secondary depression. All the above cognitions provides theoretical basis for finding potash ore in Jiangling depression.

References

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