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Objectives and methods

The member 2 of Paleogene Funing Formation in Qintong Sag of Subei Basin is a set of mixed sedimentary strata with terrigenous debris and carbonates in different degrees, in which abundant shale oil resources have been proved in recent years[1]. However, due to the complex rock types and assemblage characteristics, the organic matter enrichment mechanism and distribution characteristics of the organic-rich source rocks are still unclear[2], which make it difficult to predict the favorable enrichment target strata of shale oil of the member 2 Funing Formation in the study area. In order to reveal the formation conditions and distribution characteristics of the organic-rich source rocks in mixed sedimentary rocks series, this study systematically analyzed and discussed the geochemical characteristics, sedimentary environment and organic enrichment mechanism in the different types of the rocks by using organic and inorganic geochemistry methods.

Discussion of Results

The results show that the organic-rich sources of mixed sedimentary rocks in the second member of Funing Formation in Qintong Depression mainly includes laminae mudstone or shale rich in carbonate minerals. The weathering of the basic rocks in the southern section of the Tanlu Fracture zone provided abundant nutrients for the lake basin, which promotes algal blooming to enhanced paleoproductivity. Alternating between relatively arid and warm-humid climate conditions led to stratification of the water column established strong reduction and high salinity at the bottom of the water column, which enhanced preservation of organic matter and formed laminar organic-rich mixed sedimentary rock. In conclusion, formation of the organic-rich mixed sedimentary rocks in the study area is jointly controlled by the strong reducing saline stratified water environment formed by the frequent alternations of dry and wet climate and the relatively high level of paleoproductivity.

[1]Zan et al (2021). *Petroleum Geology & Experiment*, 43(02):233-241. [2]Cao et al (2020). *Marine and Petroleum*