Geochemistry and provenance of Quaternary sandstones in the Qiongdongnan Basin, northern South China Sea

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In recent years, the exploration of unconventional resources in the South China Sea has become a research hotspot, but previous studies in this area mainly focus on the deep layer. High-quality reservoirs are widely developed in the quaternary system of Qiongdongnan Basin, and the establishment of provenance system is the basis of studying the development mechanism of high-quality reservoirs. However, there is still a lack of provenance system research in this area. Therefore, it is very significant to find out the source sink system of quaternary system in Qiongdongnan Basin. Therefore, it is very important to explore the source and sink system of Quaternary in Qiongdongnan Basin. In this study, the main element parent rock analysis, trace element distribution characteristics, heavy mineral assemblage patterns, zircon U-Pb dating and other geochemical analysis methods were used to comprehensively compare and analyze the provenance indicators. The three provenance regions of Red River, central Vietnam and Hainan Island were established based on the structure of the integrated basin and provenance conditions. It was confirmed that the provenance of Hainan Island was partially supplied, and the main source was Red River provenance in the northwest of the basin and central Vietnam provenance in the west in the Ledong Formation of Qiongdongnan Basin. The Quaternary provenance system established in this study provides an important basis for studying the provenance evolution of the South China Sea and its surrounding areas, and lays a foundation for reservoir evaluation in this study area.