

## **A Quantitative Method for Evaluating the Transporting Capacity of Oil Source Faults in Shallow Formation of Oil-Rich Depressions**

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### **ABSTRACT**

Faults have an important effect on reservoir formation and distribution in shallow and non-generation formation. However, the fault transporting capacity cannot be evaluated quantitatively at present. Taken the oil-rich Zhanhua depression in Bohai Bay Basin as an example, this study analysed the factors influencing the transporting capacity of oil source faults, and presented a quantitative method for evaluating their transporting capacity. In Zhanhua depression, the source rocks occur in the Paleogene Shahejie Formation; the oil dominantly accumulated in the Neogene strata; and the main hydrocarbons were generated and expelled on a large scale during the late period of Neogene through oil source faults. The transporting capacity of oil source faults is mainly constrained by fault static characteristics, fault activity, and hydrocarbon-expulsion intensity of source rocks. With the fault dip angle increasing, the component force of buoyancy along the fault surface becomes larger, and so does the driving force of hydrocarbon migration. When the angle between fault strike and principal compressive stress is smaller, the opening degree of fault surface is higher and the fault will have a higher transporting capacity. Under the same conditions, more hydrocarbons will be transported by faults with the increasing hydrocarbon-expulsion intensity of the source rocks. The fault transporting capacity will be relatively stronger in a certain range when the fault activity rate get larger and the inactive phase of the faults becomes later during the main hydrocarbon charge time. Besides, faults will transport more hydrocarbons when they extend longer. Considering the contribution of fault activity rate in different periods and the expulsion intensity of different source rocks to the Neogene hydrocarbon accumulation, we assigned fuzzy values to each factors and further presented a quantitative method for evaluating the transporting capacity of oil source faults. The method can meet the reality according to the exploration.