



Geochemical characteristics of the fluid inclusions in the Gangxi Fault Belt, Huanghua Depression, Bohai Bay Basin, China

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Abstract: We studied the geochemical characteristics of the fluid inclusions in the Ordovician carbonates and the Oligocene Shahejie Formation sandstones from 15 wells in the Gangxi Fault Belt, Huanghua Depression. The fluid inclusions are all secondary with gas/liquid ratio of 5-10%. Base on Raman they are mainly composed of H₂O, CO₂ and CH₄. The homogenization temperatures, combined with burial and geothermal history of the host rock, indicate that the fluid flows in the Shahejie Formation and the Ordovician carbonates were trapped in Neocene. Using a VG5400 mass spectrometer, the helium isotopic compositions were analyzed. Interpretation of results suggested a significant amount of mantle-derived helium mainly accumulating in the intersections of the NWW trending Xuzhuangzi and NE trending Gangxi faults. The maturity of hydrocarbon decreases from the intersection to the outside pointed out that the fluid related to the NWW trending Xuzhuangzi and NE trending Gangxi faults. These factors implied the fluid inclusions have a close relationship to the local tectonic setting. Gangxi Fault Belt experienced intensive Neo-tectonic activities in Cenozoic. Widespread faulted-depressions and strong volcanic eruptions manifested its tectonic status of extensional stress field. Mantle uplift caused the movement of magma that carried mantle-derived gases and deep heat flows, the deep-rooted tension

faults provided the passages for the gases and heat flows to shallow crust levels.

Key words: Gangxi Fault Belt, Fluid inclusion, Composition, Mantle-derived, Maturity, Local tectonic setting