

## Geology of the Hutubi Gas Reservoir in the Eastern Margin of the Junggar Basin, Northwest China

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The Hutubi gas reservoir in the eastern margin of the Junggar Basin, northwest China, is the largest gas discovery found to date within the basin. The gas condensate is produced from the Paleogene Ziniqanzi Formation. Hydrocarbons-source correlation indicates that the Hutubi oil and gas were originated from a Jurassic source rock with type-III kerogen. The methane isotopic data ( $\delta^{13}\text{C}_1$  -37.8‰ to -32.1‰) indicate that the reservoir gas was generated in a mature to highly mature stage and the Heptane and Isoheptane values of the condensate (17 and 1.5, respectively) suggest that the oil was generated in a mature stage. While the Hutubi anticline was formed in the late Himalayan as suggested by structural restoration, the Jurassic source rock reached its peak hydrocarbon generation in the Cretaceous. The timing of hydrocarbon generation and the trap formation appears to be not matching. On the basis of detailed geological and geochemical analyses, we concluded that the Hutubi gas reservoir was formed as a result of upward re-migration and re-accumulation of the oil and gas previously pooled in reservoirs within the deeper Jurassic/Cretaceous formations. The early oil and gas pools with their traps formed in the late Yanshan to early Himalayan functioned as oil and gas “transfer sites” for the lately formed Hutubi structure. Future exploration in the area should pay particular attention to those targets which are adjacent to or connected by faults with deeper Jurassic/Cretaceous traps formed in the late Yanshan to early Himalayan.