

Paper Number: 532

## **The hydrocarbon trap distributional patterns of the simple slope area of a continental basin: a case study from the Songliao Basin, China**

Wang, H.Y.

China University of Geosciences, Beijing, 100083, China. wanghy@cugb.edu.cn

---

Simple slope areas of continental sedimentary basins feature simple stratal overlap, gentle changes in slope, uniform dip angles and little fault development. Therefore, locating hydrocarbon traps in these environments presents a difficult challenge [1,2]. The Western slope of the Songliao Basin is a vast simple slope area with known hydrocarbon deposits. Based on the analysis of seismic, logging and core data, the paper discusses reservoir sandbody and hydrocarbon trap development and their distributions within the simple slope area of the Songliao Basin. This paper also analyzes the basin's structural evolution and sedimentary systems as determinants influencing the distribution of reservoir sandbodies and oil and gas bearing zones of the Songliao's Western slope.

The results show that the simple slope area of the Songliao Basin has a number of sandbodies. The gentle inclination of the simple slope confers the important sandbody features of thin singular layering, extensive lateral distribution and frequent interbedding with mudstone layers. In the monoclinical slope areas which lack significant fault development, sandbodies served as important hydrocarbon migration pathways. Spatial shifts in the sedimentary system caused by basin subsidence and late stage tectonism can help constrain the search for hydrocarbon traps. The spatial patterns of the sedimentary system determined the distribution of different types of trap. Delta lobes fed by northerly source regions for example were laterally tilted, creating sandbodies that form up-dip, wedge-out lithologic traps along the western regions of delta lobes. The delta lobes are folded or cut by faults along their peripheral edges, making structural traps and combination traps become the primary trap types in this region. The delta lobes in the western provenance system, however, are tilted in a direction parallel to that of sediment supply. Most subaqueous distributary channel sands had direct access to the western erosional area, and lacked seal conditions. Lenticular lithologic traps are therefore found only along the outer edges of delta lobes and the adjacent shallow lacustrine environments.

This study refined the hydrocarbon trap distribution and formation conditions, and can inform petroleum exploration strategies for comparable basins in other localities.

### *References:*

[1] Prather B.E. (2003): Marine and Petroleum Geology, 20: 529-545

[2] Slatt, R.M. (2007): Bulletin of the South Texas Geological Society, 47(6): 15-24

