

## **Gas Migration and Accumulation in the Kelasu Fold-Thrust Belt, Kuche Depression, Tarim Basin, China**

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Despite of the discovery of several medium to large gas fields in the thrust belt of Kuche Depression, Tarim Basin, the mechanisms for gas migration and accumulation are still poorly understood. An integrated analysis of data from drilling, petrography and geochemistry was carried out to document the key factors affecting gas accumulation in the basin.

From over 10 structural traps drilled in the Kuche Depression authigenic kaolinites (AK), and source-connected and salt-crossed (SCs) fault networks are found to be closely associated with traps that contain major gas accumulation. AK and/or SCs are absent in the dry traps. In the largest gas field in the depression (Kela-2), AK accounts for up to 20% of the clay minerals in the reservoir sandstone. AK commonly occurred as pore fills and/or attached booklet and vermicular on sand grains and is believed to be precipitated from dissolved feldspar solution during the late diagenesis. Secondary porosity is well developed in reservoirs where the AK is present; indicating that much of the dissolved materials had been expelled out of the reservoir sandstone through the faults cutting across the overlying salt-gypsum beds as testified by the enormous gas show encountered in the shallow intervals above salt-gypsum level over Kela-2 trap.

The major factors controlling gas migration and accumulation in the Kuche Depression are (1) the development of secondary porosity in reservoirs through feldspar dissolution and the precipitation of AK; (2) the presence of SCs fault networks as major migration conduits for organic acid, CO<sub>2</sub> and gas.