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The sedimentological and digenetic characteristics of Sulige gas field, Ordos basin

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The Sulige gas field is located in the Suligemiao area in the northwestern of Ordos Basin. The exploration goals of this field include the eighth member of Shihezi formation and first member of Shanxi formation of Permian, of which the reservoirs are tight sandstones. The core descriptions show: (1) the sandstones are mainly composed of quartz and rock fragments, have only minor amount of feldspar ($<$5%), and can mainly be classified as chert litharenites and litharentes, (2) grains are mainly medium to coarse sizes with mainly sub-angular to subrounded shape and high content of infillings, (3) Cross strata (including trough, planar and wedge) and massive structures are common. These facilitate to explain that the reservoirs are deposits of sandy braided rivers that can be subdivided into five facies of bars, channel-fillings, abandoned channels, crevasse splays and flood-plains. Thin section observations and X-ray analysis show the sandstones had undergone strong compaction and cementation. The cements contain calcite, chlorite, kaolinite, illite, mixed-layer illite-smectite and sparse quartz. These tight reservoirs are resulted from low compositional and textural maturity and strong digenesis.