

The whole natural gas bearing system in stacked deposits —A case study of the coal derived gas from the Ordos Basin

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Coal-derived natural gas is being continuously explored in the Ordos Basin, containing unconventional - conventional gas bearing systems. Deciphering the gas layers distribution in the Lower to Upper Paleozoic and Mesozoic, as well as discussing the formation of multi-layer natural gas systems, can provide reference for incessant natural gas exploration breakthroughs in the coal bearing basins. Multi-types natural gas can be recognized, including the continuous coalbed methane, shale gas and quasi-continuous tight gas, which are mainly controlled by the source rocks. The lithologic and tectonic natural gas in the Triassic, which are mainly controlled by the traps. The bauxite gas in the Carboniferous and lithologic gas in the Ordovician Majiagou Formation. And the natural gas reservoirs superimposed each other in the strata section, forming whole gas systems within the coal measures and its upon and underlying strata. Controlled by the sedimentation, reservoir, and carrier systems, stacked, side-stacked and isolated gas-bearing sand bodies can be observed, as well as lens and fractured types reservoirs. The formation of the coal-measure whole gas bearing system is based on the continuous charging of coal-measure hydrocarbon generation, and the core is the dynamic process of natural gas “generation-migration-accumulation-dispersion”. The exploration work should focus on coal measure deposition-hydrocarbon generation evolution, and the reservoir should not be limited to the coal measure itself. A detailed understanding of the coal derived methane accumulation is beneficial for a low carbon energy society transition.