# Geological Features and Exploration for Tight Gas, Shale Gas and Other Unconventional Oil/Gas Resources in China

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In China, unconventional oil/gas resources are becoming increasingly important in petroleum exploration and production.

Unconventional oil/gas resources in China involve two types, "continuous" and "discontinuous". Continuous oil/gas resources include tight gas, coal bed methane, shale gas, biogenic gas, and gas hydrates. The Upper-Palaeozoic tight gas in Sulige gas field in Ordos basin and the Lower-Cambrian and Lower-Silurian shale gas in Sichuan basin are continuous gas resources. Discontinuous oil/gas resources include some oil sands, heavy oil and fracture-cavity reservoirs, for instance, some fracture-cavity carbonate reservoirs in Tarim basin and deep volcanic reservoirs in Songliao basin.

Continuous oil/gas accumulations are unconventional-trap reservoirs which continuously or quasi-continuously distribute in large spatial unconventional reservoir systems with no obvious trap boundaries. "Continuous" refers to the continuous or quasi-continuous distribution of hydrocarbon. The essential characteristics of continuous oil/gas accumulations are: large-scale continuous distribution in central basin or slope area; accumulated in unconventional reservoir systems; lack of obvious trap boundaries and direct seal rocks; no uniform oil/water or gas/water contacts and pressure system; weak fluid differentiation; diverse oil or gas saturation, and coexisting miscible oil-gas-water system. In general, even pore throat diameter <2μm, porosity <10%, permeability <1mD, TOC >1%, Ro>0.7%, and excess pressure >10MPa are favorable for forming continuous oil/gas accumulations. And we have developed evaluation Microsoft UNRAMS1.0 which can effectively predict continuous oil/gas resources.

Unconventional oil/gas resources are abundant in China. The perspective resources of shale gas is estimated 100 trillion m3, proved reserves of upper Palaeozoic tight gas in Ordos basin 1.5-2 trillion m3 and proved reserves of tight gas of Upper-Triassic Xujiahe formation in Sichuan basin 0.5-1 trillion m3. Tight gas, some carbonate and volcanic fracture-cavity oil/gas, coal bed methane and biogenic gas, which accounts for 50% of national total reserves and production, are practical areas for increasing reserves and production. Shale gas is experiencing rapid development, and gas hydrates are future strategic alternative areas.