

Accumulation mechanism analysis on tight sandstone gas

FAN YANG*^{1,2}, BAO DONGMEI¹, JIANG LIN¹, HONG FENG¹
AND HAO JIAQING¹

¹ PetroChina Research Institute of Petroleum Exploration & Development, Beijing 100083, China
fanyang1228@163.com (*)

² School of Geosciences, China University of Petroleum (east China), Qingdao, Shandong 266580, China

The main difference between tight sandstone gas and conventional oil/gas is that the buoyancy effect of tight sandstone gas is not obvious due to larger capillary resistance, so the migration process is the accumulation process at the same time. According to the relationship between source and reservoir, the tight sandstone gas has mainly two types. One is “source-reservoir superimposed” tight sandstone gas whose source rock is close contact with reservoir, such as the reservoir of Upper Triassic Xujiahe Formation in western Sichuan Foreland Basin. Another is “source-reservoir separated” tight sandstone gas whose source rock is not neighbouring to but not far from reservoir, such as the pre-salt deep reservoir in Dabei region of the Kuqa Foreland Basin. Although the relationship between source and reservoir is different, the gas filling power is all pressure difference between source and reservoir. But due to the certain heterogeneity of pore-throat distribution in tight reservoir, gas filling level is different under different filling pressures. The larger pore-throat in reservoir is easiest to be filled, however smaller pore-throat requires higher filling pressure, as a consequence, in normal conditions, the higher the filling pressure, the better the gas-bearing character of tight reservoir is. But the filling pressure cannot increase unlimited, the gas-bearing character of tight reservoir will be limited by a certain degree, there must be a certain amount of bound water, so tight sandstone gas usually form distribution characteristics of large areas, continuous and low abundance.