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塔里木盆地迪那2大型凝析气田的地质特征及其成藏机制

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摘要:

塔里木盆地库车坳陷迪那2凝析气田是中国目前发现的储量规模最大的凝析气田, 含气层位为古近系苏维依组与库姆格列木群; 储集岩以粉砂岩、细砂岩为主, 属于低孔低渗储层, 近似于致密砂岩气。气藏储量丰度大于15亿方/km², 气油比为8100~12948m³/m³, 凝析油含量60~80g/m³。储层温度129~138℃, 地温梯度为2.224℃/100m; 地层压力为105~106MPa, 压力梯度为0.39MPa/100m, 压力系数为2.06~2.29, 属于常温超高压凝析气藏。天然气以湿气为主, 碳同位素较重, 属于典型的煤成气; 原油碳同位素较重, 生物标志化合物体显出陆相油特征。研究认为, 油气主要来自阳霞凹陷侏罗系煤系烃源岩; 圈闭形成时间较晚, 根据热史、埋藏史、烃源岩热演化史、流体包裹体等资料以及天然气碳同位素动力学拟合的油气充注成藏时间都表明, 迪那2凝析气田的成藏时间是在2.5Ma以来, 是一个典型的晚期快速充注成藏的大型凝析气田。晚期前陆逆冲挤压作用在形成超压的同时, 发生了储层的致密化和烃类的充注, 储层致密化过程与烃类充注同步。

英文摘要:

The the Dina 2 gas field, locating in the Kuqa Depression, Tarim Basin, is the largest condensate field in China. The gas beds are the Suweiyi Formation and the Kumugeliemu Group of the Paleogene. The lithology of reservoir is silts tone and fine sandstone, with low porosity and low permeability, which is similar to tight sandstone gas. The reserve abundance is more than $1.5 \times 10^9 \text{m}^3/\text{km}^2$, and the GOR is 8100~12948m³/m³ including 60~80g/m³ condensate oil. The geothermal system is regular with 129~138℃ of the formation temperature and 2.224℃/100m of geothermal gradient, while the pressure system is quite abnormal with 105~106MPa of ground pressure and 0.39MPa/100m of pressure gradient or 2.06~2.29 of the pressure ratio, showing a hyperpressure system. The major component of the natural gas is wet gas, with heavy stable carbon isotope, showing a typical coal-derived origin. The heavy stable carbon isotope and biomarkers indicate terrestrial characters of the oil. The hydrocarbon was sourced from the Jurassic coaly shale of the Yangxia Sag. The trap of the Dina 2 was formed quite late. According to data of geothermal history, burial history, evolve history and fluid inclusion, and the reservoir formation time fitted by kinetics of the gas carbon isotope, we can see that the Dina 2 condensate gas field was formed since 2.5Ma. It is a typical fast charging gas reservoir in late stage. When foreland thrusting and hyperpressure was formed, the reservoir became tight and the hydrocarbon charged into the reservoir, i.e., the process of tight the reservoir and hydrocarbon charging occurred at the same time.

关键词: [凝析气](#) [致密砂岩气](#) [超高压气藏](#) [迪那2气田](#) [库车坳陷](#) [塔里木盆地](#)

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