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塔中隆起海相碳酸盐岩大型凝析气田成藏特征与勘探

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摘要:

多次资评与勘探实践表明塔中隆起成藏条件优越,海相碳酸盐岩油气资源丰富,奥陶系油气藏集中赋存于上奥陶统礁滩体与下奥陶统风化壳储层中,缝洞系统控制了大型凝析气藏纵向多套叠置-横向准层状分布规律。多学科、动静态一体化研究表明,形成塔中海相碳酸盐岩大型凝析气田主力烃源岩为寒武-奥陶系两套碳酸盐岩,原油具有明显的混源特征,天然气主要来源于中-下寒武统高成熟度原油裂解气。奥陶系海相碳酸盐岩凝析气藏是古油藏在喜山期被寒武系来源的原油裂解气气侵的结果,经历了三期成藏过程,即中晚加里东期、晚海西期原油充注,喜山期注气。两套烃源岩长期供烃是形成塔中奥陶系海相碳酸盐岩大型凝析气田的物质基础,构造作用、岩溶作用是形成了塔中奥陶系多套优质碳酸盐岩储集体的主控因素,断裂、不整合面、缝洞发育带构建的网状油气输导体系是塔中海相碳酸盐岩复式聚集混源成藏的重要保障。塔中奥陶系海相碳酸盐岩具备10亿吨当量的油气资源潜力。

英文摘要:

Plenty of resource evaluation and exploration work in Tazhong Uplift have confirmed its superior accumulation condition and abundant oil-gas resources in marine carbonate rocks, dominantly occurring in the reef-bank body of Upper Ordovician and weathered crust of Lower Ordovician. In this area, large condensate reservoirs' distribution, which is remarkably characterized by multi-superimpositions in vertical and layer-like features in horizon, is mainly controlled by relative cave-fracture systems. Researches from both multi-discipline and combination of static and dynamic analysis show that large condensate reservoirs in Tazhong Uplift, mostly the carbonate reservoirs of marine face, are primarily feed by two suite of carbonate rocks of Cambrian and Ordovician, whose raw oil is obviously of mixed sources feature; comparatively, the gas mainly comes from the highly matured pyrolysis gas of the Middle and Lower Cambrian; moreover, the Ordovician condensate reservoirs developed in the Himalayan period by the intrusion of Cambrian pyrolysis gas on the palaeoreservoirs, which has experienced three periods of accumulation: oil injected during Late Caledonian-Late Hercynian period, while gas injected during Himalayan period. Hydrocarbons from two sets of source rocks are the material basis of forming large condensate gas fields of Tazhong Ordovician marine carbonate; tectonics and karstification are the dominant factors that form multiple sets of high-quality carbonate reservoirs in Tazhong Ordovician, additionally, mesh-conduct systems of oil and gas constructed by faults, unconformities and fracture-cave development belts are the important guarantee of accumulation mechanism of Tazhong marine carbonate, which displays complex accumulation and mingled source rocks. Interestingly, Ordovician marine carbonate has a potential reserve of 1 billion bbl hydrocarbon.

关键词: [凝析气田](#) [碳酸盐岩](#) [礁滩复合体](#) [岩溶风化壳](#) [塔中隆起](#)

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