

盖层封盖能力对天然气聚集的影响-以鄂尔多斯盆地大牛地气田大12井区为例

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Influences of caprock sealing capacity on natural gas accumulation: an example from D-12 wellblock of Daniudi gas field in Ordos Basin

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摘要

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摘要 针对大牛地气田生产过程中出现的纵向和平面产能差异大的问题,以岩心、分析化验和测井资料为基础,通过对盖层封闭机理及封闭能力对天然气富集影响分析,发现研究区盖层属于致密泥岩层与欠压实泥岩层相互叠置形成的超压封闭盖层,盖层封闭能力受正常压实的泥岩与欠压实泥岩共同控制;针对两种封闭机理分别选择盖层厚度、总孔隙度、含砂量和异常孔隙流体压力参数对盖层进行评价。评价结果表明:盖层封闭能力与储层平均试采无阻流量和最大试采无阻流量具有正相关关系;下石盒子组三段在区域盖层的封闭下成为主力产气层段,其高产气区主要集中在研究区的西部边缘,其他目的层段受制于直接盖层封闭能力,含气丰度较低,平面分布比较零散,均未形成大规模连片的含气区,这正是研究区产能受限的关键所在。

关键词: [盖层](#) [封闭机理](#) [天然气](#) [大牛地气田](#) [鄂尔多斯盆地](#)

Abstract: In view of the large variations of production capacity both vertically and laterally in Daniudi gas field, this paper analyzed the influences of the caprock sealing mechanism and capability on natural gas accumulation by cores, laboratory test and logging data. The result indicates that the caprocks are overpressure sealing caprocks consisting of interbedded tight mudstone and undercompacted mudstone. The sealing capability is jointly controlled by the normal compacted mudstone and uncompacted mudstone. Thickness, total porosity, gross-to-net ratio and abnormal pore fluid pressure are selected as parameters to assess the sealing capacity of caprocks. The sealing capability is in positive correlation with the tested average open flow capacity and the maximum open flow capacity. The 3rd member of Xiashihezi Formation is the main gas pay zone thanks to the regional caprocks, and the high yield area is located on the western edge of the study area. The other pay zones are controlled by the sealing ability of direct caprocks, their gas are too scattered with low abundance to form large-scale contiguous gas-bearing areas which is a key factor limiting productivity in the D-12 wellblock.

Keywords: [caprock](#) [sealing mechanism](#) [natural gas](#) [Daniudi gas field](#) [Ordos Basin](#)

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