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致密砂岩气藏储量计算方法探讨——以容积法计算SX区块储量为例

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Calculation Method Discussion of Tight Sandstone Gas Reserves : A Case of Volumetric Method in SX Block

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摘要/Abstract

摘要 :

鄂尔多斯盆地苏里格气田属致密砂岩气藏,其低孔低渗、强非均质性的特点决定了其常规储量计算方法的难度,而致密砂岩气藏储量计算方法的探讨对于气藏的合理开发利用具有重要意义。以SX区块为例,探讨了利用容积法进行储量计算的过程和应注意的问题,并形成一套完整的计算体系。容积法的具体计算方法和步骤如下:①综合测井及解释数据、地震、岩心等资料,分别运用分布函数曲线法、经验统计法、测试法、拟合公式等方法求取了盒8段、山1段的孔渗、含气饱和度下限值②利用钻井与试气数据,参考地震预测成果,结合砂体展布划定含气区域③在确定物性下限的基础上,结合“四性”标准划分有效储层,求取有效厚度④利用气层中温和中压,求取对比温压,得到偏差因子并最终求取气藏储量。研究区储集层的物性和含气区域等因子受沉积和成岩作用的影响,辫状河三角洲沉积体系发育良好的有效砂体展布,河道砂体在沉积过程中可反复迁移,多期叠置,厚度大,分布面积广。压实作用、胶结作用抑制了孔隙发育,降低储层物性,溶蚀作用、压裂作用极大地改善了储层孔渗,对储层油气储集和运移影响较大。

关键词: 鄂尔多斯盆地, 苏里格气田, 致密砂岩, 储量计算, 物性下限, 有效储层

Abstract:

The Sulige Gasfield in Ordos Basin is a tight sand gas reservoir, and its low porosity, low permeability, and strong heterogeneity increased the difficulty of the other calculating methods. Research on the calculation method of tight gas reservoir is of great significance for the rational development of gas reservoir. Here is the volumetric method of tight gas reserve: (1) Based on geological interpretation of logging data, seismic data, core analysis, distribution function curve, experience statistics and other methods were used to determine the lower limit of porosity and permeability in He8 and Shan1 Formations (2) Sandbody controlled the reserve area, drilling data and seismic analysis predicted its distribution (3) Lower limits and four properties standard determined the effective reserve and its thickness (4) The center temperature and pressure data were used to calculate gas deviation factor and finally the geological reserves were obtained. The reservoir property and gas-bearing area were affected by the deposition and diagenesis. The braided river delta develops a set of good reservoir, repeated and overlay migration make a thick-wide distributed sand body. Compaction and cementation inhibit porosity evolution, leading to a lower reservoir properties. Dissolution and fracturing greatly improve reservoir properties and make an impact on the storage and transport of oil and gas.

Key words: Ordos Basin, Sulige Gasfield, Tight gas sandstone, Reserve calculation, Petro physical parameter cutoff, Effective reservoir

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