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南海北部超压低渗气藏成藏过程与成藏模式——以莺歌海盆地XF区XF13-1超压气田为例

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The Accumulation Process and Model of Overpressured Low Permeability Gas Pool in the North of South China Sea: A Case Study of XF13-1 Overpressured Gas Field in XF Area of the Yinggehai Basin

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PDF (PC)

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摘要/Abstract

摘要:

随着南海深部层系高温超压天然气勘探的深入,储层及天然气分布的复杂性日益凸显,亟待从成藏过程的角度深入剖析天然气成藏模式,以指导下一步天然气勘探。基于样品分析测试、三维地震等资料,运用天然气地球化学、成藏过程研究方法,研究了莺歌海盆地北部XF区XF13-1上中新统黄流组一段(以下简称"黄一段")超压低渗气藏成藏过程与成藏模式。研究认为,XF13-1气田具有2种低渗气藏成藏模式:①以XF1-1-14井区黄一段 I 气组低渗气藏为代表的"天然气先充注、储层后致密、后超压"型成藏模式,是莺歌海盆地深部层系最有利的天然气成藏模式:②以XF13-1-4井区、XF13-1-6井区黄一段 I 气组低渗气藏为代表的"天然气充注、储层致密、超压"同期型成藏模式,该模式具有"超压、低渗、天然气组分复杂"的天然气成藏特点。在成藏过程分析和成藏模式指导下,结合沉积体系研究成果,提出了2个具备"天然气先注、储层后致密、后超压"型成藏模式的有利区,是下一步有利的天然气勘探方向。

关键词: 天然气成藏过程, 超压低渗气藏, 成藏模式, XF13-1, 莺歌海盆地

Abstract:

It is urgent to understand natural gas accumulation model from the accumulation process in order to provide guidance for further exploration of deep-layers with high temperature and overpressure in South China Sea. The accumulation process and accumulation model of overpressured low permeability gas pool of the 1st member of Huangliu Formation of Upper Miocene of XF13-1 in XF area, Yinggehai Basin, have been studied by applying natural gas geochemistry and natural gas accumulation process research method in light of well data and 3D seismic data. Two kinds of accumulation models were constructed for XF13-1 gas field: One model is characterized by the feature that gas charged firstly, then reservoir changed tight and overpressured. The I gas unit of XF1-1-14 well was regarded as an example of this model. This model with good natural gas component, was thought of as the most favorable natural gas accumulation model of deep strata in Yinggehai Basin. Another model had the characteristic that gas charged, synchronized by reservoir changing tight and overpressured. The II gas unit of XF13-1-4 well was an example. Two favorable areas with the first gas accumulation model were proposed.

Key words: Natural gas accumulation process, Overpressured low permeability gas pool, Accumulation model, XF 13-1, Yinggehai Basin

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