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应用流体包裹体研究储层油气充注特征——以二连盆地为例

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Using Fluid Inclusions to Study Hydrocarbon Charging Characteristics of Reservoirs:A Case Study from Erlian Basin

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摘要/Abstract

摘要 :

通过对二连盆地8个富油凹陷45块下白垩系储层样品进行全面的流体包裹体分析,研究了小型断陷湖盆不同构造带储层油气的充注特征。岩相学及显微测温分析表明其主要发育一期次的流体包裹体,但在近洼缓坡部位的阿尔善组储层(K₁ba)中发育2期流体包裹体,综合埋藏史及热演化史认为深洼带源岩先成熟排烃。近洼缓坡部位源岩的后期成熟排烃造成了2期次的油气充注[利用PVTsim模拟及盐度—温度法分别恢复了流体包裹体形成时的储层压力,发现陡坡深洼带油藏在油气充注时普遍存在高压,而缓坡带油藏基本为常压充注,现今陡坡深洼带泥岩测井声波时差数据的异常也间接证明了古高压的存在]关于油气充注强度,则通过统计含油气包裹体丰度(GOI指数)与油层含油饱和度的关系,揭示了临近生烃洼槽的陡坡深洼带和近洼缓坡带储层油气充注伴随成岩作用而发生,为边埋藏边充注,GOI与充注强度大小成正比[而远洼缓坡带储层油气充注为成岩期后发生,不能用GOI丰度来表征储层油气充注强度。

关键词: 流体包裹体, 均一温度, 成藏期次, 古压力, GOI指数, 二连盆地

Abstract:

Forty five Lower Cretaceous reservoir samples collected from 8 oil-rich sags in Erlian Basin were used to study the characteristics of fluid inclusions and hydrocarbon charging features of reservoirs in different structural belts.Fluid inclusion petrography and microthermometry analysis showed the reservoirs were mainly suffered one term fluid flow except some in NTGS(Near Trough Gentle Slope) which suffered two terms fluid flows.Integrating burial and thermal history studies,the source rocks in deep trough were mature earlier than those in NTGS.In order to restore the charging pressure of the reservoirs,the PVTsim simulation of organic inclusions and the salinity-temperature method for brine inclusions were conducted to testify the results which indicated the reservoirs in deep trough were charged with overpressure,but the reservoirs in gentle slope were charged with normal pressure.Besides,the abnormal values of interval transit time logging data also verified it.The charging intensity are examined by researching on the relationship between GOI index and oil-saturation,which reveals that in the deep trough and NTGS region,the GOI is proportional to the charging intensity,whereas in the gentle slope of remote trough,the GOI can't represent the charging intensity.

Key words: Fluid inclusion, Homogenization temperature, Accumulation periods, Paleopressure, GOI Index, Erlian Basin

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