内蒙古二连盆地不同岩性潜山储层特征及其影响因素

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引用本文：李浩,高先志,杨得相,白帆,陈亚青,王会来.2013.内蒙古二连盆地不同岩性潜山储层特征及其影响因素[J].地球学报,34(3):325-337.

DOI：10.3975/cagsb.2013.03.08

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基金项目:中石油“十二五”重大研究课题“二连盆地富油凹陷深化勘探潜力与方向研究”(编号: HBYT-YJY-2011-JS-406)

中文摘要:二连盆地古生界潜山岩性分布具有多样性,利用岩心观察、薄片鉴定、物性分析、常规测井和伽玛能谱测井等技术对二连盆地不同岩性潜山储集层发育特征进行分析。结果表明灰岩潜山、凝灰岩潜山和动力变质岩潜山储集层较发育,以溶蚀型储集层为主,孔缝组合类型为洞穴型、孔洞-裂缝型、孔隙-裂缝型和裂缝-孔隙型;花岗岩潜山和区域变质岩潜山储层欠发育,储集空间主要为构造缝,孔缝组合类型为裂缝型和裂缝-孔隙型;不同岩性储集层纵向分布具有分带性,储集层主要发育于岩溶带、风化淋滤带、强风化碎石带和内幕溶蚀带;灰岩潜山和凝灰岩潜山储集层纵向分布广,具有纵向随机发育的特征,花岗岩潜山和花岗碎裂岩潜山存在风化壳储集层和内幕储集层。综合分析认为潜山储集层发育的影响因素主要包括岩性、距离潜山顶面的深度、构造运动及断裂分布和热液活动。不同岩性的储集层主要分布在距离潜山顶面80 m深度范围内;裂缝发育带沿断裂呈带状分布,而且随着与断裂距离的增加,构造裂缝分数维值逐渐减小;热液活动对储集物性起着改善和破坏双重作用。

中文关键词:潜山 凝灰岩 花岗碎裂岩 热液 分形 二连盆地

Characteristics and Controlling Factors of the Palaeozoic Reservoir Development in the Multi-lithologic Buried-hills of Erlian Basin, Inner Mongolia

Abstract:The lithology of Palaeozoic buried-hills is variable in Erlian Basin. With core, indoor rock identification and casting thin section analysis, physical analysis, conventional logging, natural gamma ray spectrometry logging and other methods, the authors compared and analyzed characteristics of multi-lithologic buried-hills of Palaeozoic reservoirs in Erlian Basin in such aspects as pore type, property and reservoir vertical distribution. The results show that limestone buried-hills, tuff buried-hills and dynamometamorphic rock buried-hills reservoirs are well-developed and are mainly of dissolution type. The style of pore-fracture combination can be divided into cavern type, cavity-fracture type, pore-fracture type and fracture-pore type. Granite buried-hills and regional metamorphite buried-hills reservoirs are poor-developed and their storage space is structural fracture. The style of pore-fracture combination can be divided into fracture and fracture-pore type. The distribution of multi-lithologic reservoirs is characterized by vertical zonation. The reservoirs dominantly develop karst zone, weathering and leaching zone, strong weathering debris zone and interior dissolution zone. Limestone buried-hills and tuff buried-hills reservoirs have wide vertical distribution and are characterized by vertical stochastic development. Granite and granitic-cataclasite buried-hills develop weathering crust and interior reservoirs. According to comprehensive analysis, the main controlling factors of buried-hill reservoir development include lithology, the distance to the top of buried-hill, structural movement, fault distribution and hydrothermal activity. Reservoirs of different lithologic characters are mainly distributed in the depth range of 80 m to the top of the buried-hill. Fracture zones are distributed in banded form along faults, and the value of fractal dimensions gradually decreases with the increase of the distance to the fault. Hydrothermal activity played both improvement and destruction roles in the development of reservoir properties.

keywords:buried-hill tuff granitic-cataclasite hydrothermal fluids fractals Erlian Basin

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