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塔里木盆地塔中上奥陶统碳酸盐台地高频层序控制的早期成岩作用及其对储层分布的影响

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摘要:

上奥陶统良里塔格组碳酸盐岩是塔里木盆地塔中地区重要的油气储层。在碳酸盐岩岩石学、微相和测井曲线分析基础上,将塔中良里塔格组划分为5个四级层序、15个五级层序,建立了高频层序地层格架。显著的选择性溶蚀,悬垂型、新月型等大气水胶结物的发育,溶蚀孔壁较弱阴极发光特征,粒内与粒间胶结物较低的Fe、Mn含量,亮晶颗粒灰岩的 $\delta^{13}\text{C}$ 、 $\delta^{18}\text{O}$ 与泥晶灰岩接近等特征表明,塔中地区I号断裂带附近洋生期大气水溶蚀作用以及早期海水胶结作用普遍发育。对比分析显示大气淡水透镜体均发育于高频层序向上变浅旋回的顶部,即高频层序格架控制了早期成岩作用的形成分布。现在保存的早期成岩溶蚀孔面孔率可达4%~5%,因此早期溶蚀孔的发育为晚期溶蚀改造提供了流体活空间和条件,对碳酸盐岩有效储层的产出具有重要控制。综合分析提出,塔中I号断裂坡折带TZ54-TZ826和TZ72-TZ62-TZ24井区等高陡台缘是共生-准共生溶蚀孔发育的有利储层区。

英文摘要:

The Lianglitag Formation carbonate of the Upper Ordovician is an important oil and gas reservoir in Tazhong, Tarim Basin. Based on the petrography, microfacies and logs analysis, 5 fourth-order sequences and 15 fifth-order sequences are recognized in the Lianglitag Formation carbonate, and a stratigraphic framework of high-frequency sequences has been established. The phenomenon that evidently selective dissolution, meteoric cements such as meniscus cement and pendent cement are found, and dissolved pore walls show dark cathodoluminescence, the intraparticle and interparticle cement with low Fe and Mn value, combined with the carbon and oxygen isotopic composition of sparry rainstone are close to the micrite, demonstrated that the early meteoric dissolution and early marine cement are widely developed in No.1 fault zone, Tazhong area. Comparative analysis shows the freshwater lens developed at the top of shallowing upward high-frequency cycles, that is, the formation and distribution of early diagenesis were controlled by the framework of high-frequency sequences. The reserved porosity resulted from early diagenetic dissolution can reach up to 4%~5% today, therefore the development of early dissolved pores provides space and conditions for fluid activity during the further late burial dissolution, leading to important constraints on the development of effective reservoir. An integrated analysis shows that TZ54-TZ826 and TZ72-TZ62-TZ24 high-steep platform margins along No.1 fault slope break belt in Central Tarim Basin, where early dissolved pores developed, were apt to favorable reservoirs.

关键词: [高频沉积层序](#) [淡水透镜体](#) [早期成岩作用](#) [碳酸盐岩](#) [塔中](#) [塔里木盆地](#)

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