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四川盆地东南部茅口组古岩溶特征及识别

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摘要:

以野外观察结合地球化学方法可以对四川盆地东南部茅口组的古岩溶进行较好的识别。该区茅口组主要发育四种类型的古岩溶,分别为沉积期岩溶、表生期岩溶、埋藏期岩溶和褶皱期岩溶,这四种类型的古岩溶在宏观特征、微观特征、包裹体均一温度、阴极射线及碳同位素和锶同位素上都表现出了一定的差异性,这些差异性综合起来可作为研究区茅口组不同类型古岩溶的识别标志。沉积期岩溶具有发育规模小,以选择性溶蚀为主及在阴极射线不发光的特征;表生期岩溶发育规模大,且主要出现在茅口组的中上部,可见大量的方斑及溶塌角砾,溶蚀孔洞充填物以中-粗晶方解石为主,局部可见少量渗滤砂,阴极射线下发暗褐色光或暗橙红色光,或两者共有而具环带结构,胶结充填物的碳同位素介于0.26‰~3.43‰之间,锶同位素介于0.7044~0.7049之间,包裹体均一温度为57~65℃;埋藏期岩溶发育规模不大,溶蚀孔洞中的胶结充填物被有机质侵染严重,常与残存的沥青共存,胶结充填物多为细-中晶方解石,阴极射线下发暗褐色光,碳同位素介于-1.44‰~-0.92‰之间,锶同位素介于0.7037~0.7049之间,包裹体均一温度为108~135℃;褶皱期岩溶的发育具有普遍性,常以裂缝或与裂缝沟通的方斑或裂缝溶蚀扩大缝的形式出现,溶蚀孔洞充填物以细-中晶方解石为主,阴极射线不发光或发暗褐色光,碳同位素介于1.58‰~4.07‰之间,锶同位素介于0.7050~0.7082之间,包裹体均一温度为58~110℃。正确判断不同区域的古岩溶类型,对理解储层的形成机制及油气勘探部署具有重要的意义。

英文摘要:

The palaeokarst in the Maokou Formation in the southeastern Sichuan basin can be recognized through field observation and geochemical methods. The palaeokarst developed into four main types: (a) depositional-period karst; (b) supergene karst; (c) buried karst; and (d) fold karst. There are several differences between the four types of palaeokarst in terms of the macroscopic and microscopic features. Homogenization temperatures and cathode ray analysis of both carbon and strontium isotopes may be used to identify and study the different types of paleokarst in the Maokou Formation of the research area. The depositional-period karst shows small scale development, mainly selective dissolution, and no light characteristics under the cathode rays. Supergene karst developed in large scale and occurred mainly in the middle and upper parts of the Maokou Formation, showing a large number of party spots and dissolved-collapsed breccias. The fillings in the dissolved pores and vugs are mainly medium-coarse-grained calcites and a small amount of local filtrated sands which show dark brown or dark reddish orange light under cathode rays. When the calcites and filtrated sands exist together, zoning is very clear. The carbon isotope of the cement fillings is between 0.26‰~3.43‰, strontium isotope ranges between 0.7044~0.7049, and the homogenization temperatures range between 57~65℃. Buried karst is small scale in development and the cement fillings in the dissolved pores and vugs contain organic matter which often coexists with asphalt remains. The cement fillings are composed of mostly fine-medium grained calcites which show dark brown light under cathode rays. The carbon isotope falls between -1.44‰~-0.92‰, strontium isotopes range between 0.7037~0.7049, and the homogenization temperatures ranges between 108~135℃. Fold karst develops universally, often occurring in cracks or party spots communicated with cracks or dissolution-enlarged fractures. The cement fillings are mostly fine-medium grained calcites, showing dark brown light or no light under cathode rays. The carbon isotope is between 1.58‰~4.07‰, the strontium isotope ranges between 0.7050~0.7082, and the homogenization temperatures ranges between 58~110℃. The correct identification of palaeokarst types in different regions holds great significance for understanding the mechanism of reservoir development and oil and gas exploration.

关键词: [古岩溶特征](#) [古岩溶识别](#) [茅口组](#) [四川盆地东南部](#)

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