



ISSN 0371-5736



GEOLOGICAL REVIEW

第 59 卷 第 2 期

Vol.59 No.2

2013



中 国 地 质 学 会 主办
《地质论评》编辑委员会 编辑
科 学 出 版 社 出版

horizons in Sichuan Basin, where "pure" limestone from high-energy shelly shoal of shallow lake facies has been usually viewed as the only kind of reservoir rock in previous studies. Based on outcrop surveying and borehole core observation as well as thin section and SEM (scanning electron microscopy) analyses, we propose in the paper that the Daanzhai Member of Ziliujing Formation is a typical lacustrine depositional sequence of mixed siliciclastic—carbonate sediments in Longgang area, central Sichuan Basin, which contains two levels of implication. In narrow sense, the mixed siliciclastic—carbonate rock means mixing of major lacustrine carbonate with minor terrigenous clastics and/or clay in various proportion. Main rock types consist of shelly limestone, sandy/silty/argillaceous shelly carbonate, calcareous shelly sandstone/siltstone/mudstone/shale, etc. In broad sense, the mixed depositional sequence implies alternating layers of shelly limestone, mudstone/shale, sandstone/siltstone and mixed siliciclastic—carbonate rock with unequal thicknesses. In general, there are three ways of mixing: punctuated mixing, in-situ mixing and facies mixing, which are respectively controlled by storm wave action, hydrodynamic condition and predominant facies. Both relatively pure shelly limestone and mixed siliciclastic—carbonate rocks are extremely tight. Almost all primary porosity has disappeared because of intense compaction since burial. The present pore spaces are largely composed of dissolution pore, dissolution micropore, microfracture and structural fracture, etc. In addition to "pure" shelly limestone, some silty/argillaceous shelly limestone and shelly siltstone/mudstone/shale with relatively good porosity and permeability could also serve as one kind of effective reservoir due to better-developed microfractures within them. These observations and drilling results imply that the silty/argillaceous shelly limestone of low-energy shelly shoal and surrounding shelly siltstone/mudstone/shale adjacent to hydrocarbon generating center are extensively developed and potential reservoir. This is particularly important for tight oil exploration, which should be paid special attention to. Therefore, a pilot exploration is recommended to be carried out.

Key words: Lower Jurassic; Daanzhai Member; lacustrine facies; mixing of siliciclastic—carbonate sediments; reservoir; microfracture; tight oil; central Sichuan Basin

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(本期执行总编辑 章雨旭、黄敏 图件修编、排版 李捷)