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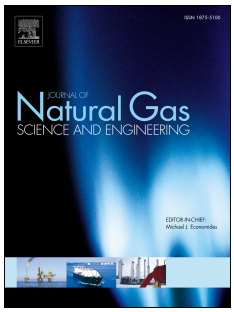

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Geological and geochemical characterization of lacustrine shale: a case study of the Jurassic Da'anzhai Member shale in the central Sichuan Basin, Southwest China

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Abstract：

Although numerous progresses have been achieved in characterizing marine shales, studies that are associated with lacustrine shales are limited. To study lacustrine shales, samples were collected from the Jurassic Da'anzhai Member in the central Sichuan Basin of China, and their mineralogical, reservoir, OM, and paleoenvironmental characteristics were determined, as well as the relationships between them. Analysis of trace elements reveals that the shales formed in paleoenvironments that were oxic to suboxic, dry to humid, had moderate to strong weathering, and were characterized by fresh to salt water conditions. These environments are more variable than those of marine shales. The paleoenvironmental conditions and mineralogy of the shales, particularly the oxic to suboxic paleo-redox conditions, resulted in the relatively low levels (0.11-2.18%, average 0.97%). However, based on evaluation criteria for continental source rocks, the OM is of high quality because of its high level of maturity (R_o: 0.95-1.43; T_{max}: 428-500°C) and favorable kerogen type (II_2). There are well-developed intraparticle pores,