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Abstract:

Tight sandstone reservoirs typically contain a wide pore throat sizes ranging from the nano-scale to micro-scale, and have complex pore geometry and pore throat structure. Microscopic pore throat structures are the most important factors affecting the macroscopic reservoir quality and fluid flow in tight sandstones. Evaluation and characterization quantitatively the microscopic pore structures, including pore geometry, pore size distribution, and pore connectivity, are of great importance for maintaining and enhancing petroleum recovery. This paper critically reviews the pore throat structures of tight sandstones, as assessed from peer reviewed papers in the literature as well as from the authors' personal experiences, in the particular contexts of comprehensive characterization and description of the entire pore throat structure using various complementary techniques. The depositional controls and diagenetic imprints on reservoir quality and pore structure are firstly discussed. The pore systems including pore throat type, pore geometry, pore size and connectivity,