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Micro-PIV Study of Supercritical CO_2-Water Interactions in Porous Micromodels FARZAN KAZEMIFAR, GIANLUCA BLOIS, KENNETH T. CHRISTENSEN, University of Notre Dame — Multiphase flow of immiscible fluids in porous media is encountered in numerous natural systems and engineering applications such as enhanced oil recovery (EOR), and CO_2 sequestration among others. Geological sequestration of CO_2 in saline aquifers has emerged as a viable option for reducing CO_2 emissions, and thus it has been the subject of numerous studies in recent years. A key objective is improving the accuracy of numerical models used for field-scale simulations by incorporation/better representation of the pore-scale flow physics. This necessitates experimental data for developing, testing and validating such models. We have studied drainage and imbibition processes in a homogeneous, two-dimensional porous micromodel with CO_2 and water at reservoir-relevant conditions. Microscopic particle image velocimetry (micro-PIV) technique was applied to obtain spatially- and temporally-resolved velocity vector fields in the aqueous phase. The results provide new insight into the flow processes at the pore scale.

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