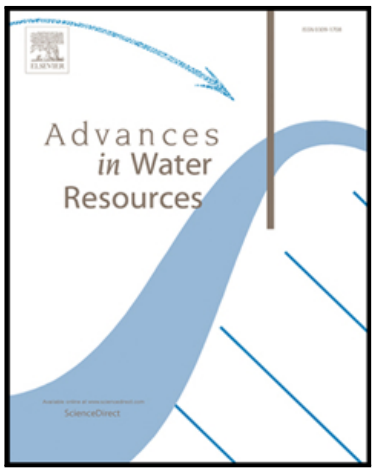

In situ characterization of immiscible three-phase flow at the pore scale for a water-wet carbonate rock.

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Highlights

- We obtained micro scale three-dimensional images of three-phase flow in situ at high temperature and pressure in a water-wet carbonate rock.
- Pore occupancy is quantified: brine, oil and gas occupy the centre of respectively small, intermediate and large pores.
- Double drainage and double imbibition are visualized in three-dimensions.
- Spreading oil layers and water wetting layers are observed and their thickness allows for effective flow.
- Wettability and the formation of oil layers favour trapping of gas over oil when the three phases are simultaneously present in the pore space.