



Fracturing normal to maximum compression: fluid overpressure in torsion experiments

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We carried out torsion experiments in synthetic aggregates of 100% halite and in two-phase synthetic aggregates composed of 70% halite and 30% coarse calcite. The pure halite specimens showed homogeneous shear strain through plastic deformation of halite grains. No brittle yielding was observed, even at microscopic scale. In contrast, the two-phase specimens showed homogeneous deformation at the scale of the sample, but heterogeneous strain at the grain scale; halite grains deformed plastically and were distorted around the coarse rigid calcite grains, and small scale shear bands formed locally in halite between calcite grains. Besides plastic deformation, the most conspicuous feature was fluid-filled fractures that formed parallel to the extension axis of simple shear. This means that the fractures opened against maximum compressive stress. We deduce that the fractures were made by over-pressured fluid.