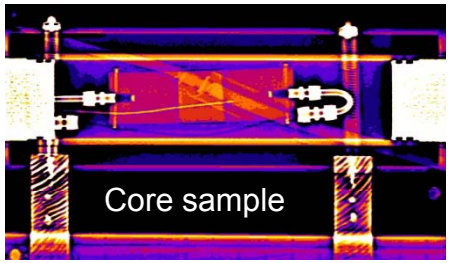
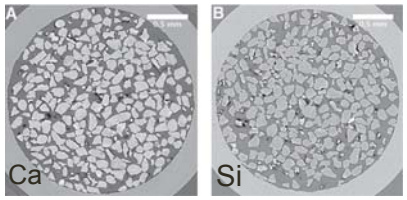
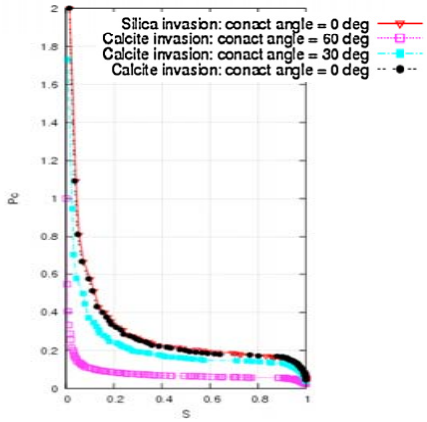
Supercritical CO_2 Flow Through Layered Silica/Calcite/Silica Sand

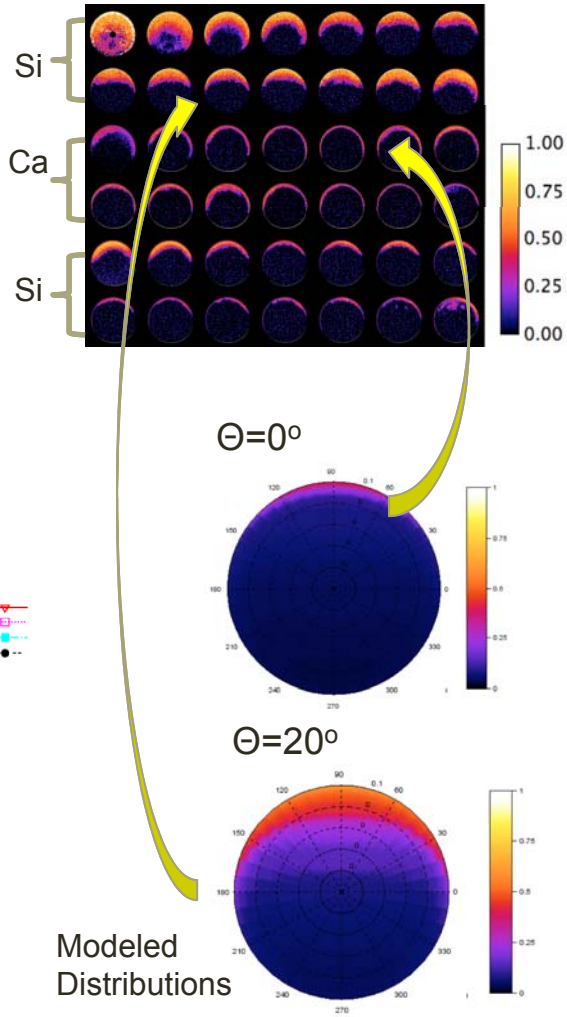
Tim Kneafsey, Dmitriy Silin,
and Jonathan Ajo-Franklin



microCT imagery







Modeled Distributions

Int. J. Greenhouse Gas Control (2013), 14, 141–150

Scientific Achievement

Examine effect of mineralogy on $scCO_2$ flow through natural porous media.

Significance and Impact

Wettability strongly impacts flow and ability of $scCO_2$ to replace water in pores

Research Details

- $scCO_2$ was flowed through a layered silica/calcite/silica sand system and the $scCO_2$ saturation was imaged using X-ray CT.
- ALS BL 8.3.2 micro-CT used to image sand subsamples. The pore network extracted form the images analyzed using the modified Maximally Inscribed Spheres (MIS) method yielding capillary pressure-saturation relationships for different contact angles.
- Core flood and computed saturation profiles were compared to infer contact angle (~0° for calcite, ~20° for silica).