Current Focus Areas:

Interaction of hydrocarbons with geological and engineered materials

Characterization of gas shale and caprock

CO₂-brine-rock interactions relevant to carbon sequestration

Gas, fluid and isotope monitoring of CO₂ injection tests; frack gas and flowback fluids

Formation of methane hydrates in sediments

Development of down-hole geophysical methods

About Us

The researchers of SEMCAL endeavor to provide a scientific understanding of pore to field scale rock-fluid interactions through state-of-the-art physical and chemical property analysis. In-depth laboratory analysis of subsurface earth materials provide a foundation to help industry and academia develop a fundamental understanding of formations relevant to resource exploration and development in Ohio, the Midwest, the Nation and the World.

Contact Us

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Students preparing samples

Goals:

- Educate and train students about subsurface processes.
- Provide chemical and physical property measurements of cores and fluids.
- Provide capabilities to simulate in-situ conditions for testing purposes.
- Develop new methods to image and analyze core and rock samples.

We have a broad spectrum of geochemical and geophysical instruments that measure nano-to macroscale rock properties.

Our Mission:

To provide scientific understanding of pore to field-scale rock-fluid interactions through state-of-the-art physical and chemical property analysis

Our equipment: Picarro cavity ring down spectrometer for carbon isotope analysis

Equipment:
- Probe permeameter
- Pulsed decay permeameter
- Micromeritics mmercury porosimeter
- Archimedes work station (bulk & grain density)
- Micromeritics surface area analyzer
- PANalytical X-ray Diffractometer
- Leica RES 102 Dual Ion Mill
- FEI FEG SEM with QEMSCAN software
- Picarro cavity ring down spectrometer
- Costech elemental analyzer (COHNS)
- OI Analytical Carbon Analyzer
- X-ray computed tomography
- Bruker 20MHz low-field NMR
- Stirred batch hydrothermal reactors
- Gamma spectral core scanner
- High P-T biaxial resistivity and triaxial acoustic velocity core holders
- Dean Stark and soxhlet fluid extraction systems
- ThermoFisher Delta V Advantage stable isotope ratio mass spec with gas chromatograph
- Computer Lab for numerical modeling and visualization

PANalytical XRD Porosimeter