

EERC LABORATORY CAPABILITIES

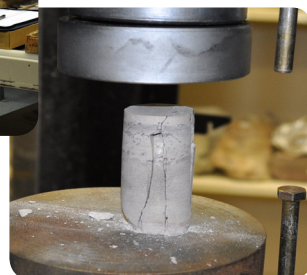
...Solutions for the CCS Marketplace



The Energy & Environmental Research Center (EERC) has the laboratory facilities, expertise, and experience to perform all scales of materials analysis and reservoir characterization. EERC laboratories work jointly to address a multitude of standard and nonstandard tests designed and implemented to exceed client needs. From nanoscale electron microscopy through macroscale core evaluations, the EERC has the capabilities and know-how to address the research needs of the carbon capture and storage (CCS) marketplace.

Today's energy and environmental research needs require the expertise of a total-systems team that can focus on technical details while retaining a holistic viewpoint. The EERC is known for its ability to bring cutting-edge science and energy technologies to the commercial market. Over the last five decades, the EERC has conducted research and testing into fuels development, combustion and gasification technologies, emission control technologies, ash use and disposal, groundwater, waste-to-energy systems, and advanced environmental control systems. In 2003, the EERC expanded its capabilities to encompass the needs of the oil and gas industry and the emerging CCS marketplace.

EERC laboratories possess a large variety of state-of-the-art equipment suitable for a variety of tasks including analysis of mechanical or chemical effects on reservoir rocks, fluids, or industrial materials. Reactors are available to simulate exposure to gas or fluids under a host of reservoir and flow conditions. The Analytical Research Laboratory (ARL), the Natural Materials Analytical Research Laboratory (NMARL), the Environmental Chemistry Laboratory, and the Applied Geology Laboratory (AGL) team provide robust and accurate results in an efficient manner.



Analytical Research Laboratory

The ARL provides quality data, flexibility, and rapid turnaround time in support of research activities at the EERC. The lab employs standardized and novel analytical procedures to determine major, minor, and trace constituents in a wide variety of sample types including:

- Fossil fuels
- Biomass
- Combustion by-products
- Geologic materials
- Plant materials
- Groundwater
- High TDS (total dissolved solids) reservoir brine
- Wastewater

Natural Materials Analytical Research Laboratory

The NMARL offers analytical services designed specifically to address engineering problems in a wide range of fields. Analytical facilities combined with an experienced team of researchers provide a full range of advanced materials characterization and data interpretation using the following:

- Scanning electron microscopy
- QEMSCAN®
- X-ray fluorescence
- X-ray diffraction

Applied Geology Laboratory

The AGL has the ability to perform testing ranging from basic petrographic and routine core analysis to advanced evaluations such as relative permeability and porosity distribution. Its diverse team of engineers and geologists work to provide solutions relevant to the petroleum industry.

Geomechanical

- Uniaxial compression
- Triaxial compression
- Consolidation/constant rate of strain testing
- Special mechanical testing

Geochemical

- Fluid analysis
- Optical mineralogy/thin-section preparation and analysis
- Batch reaction exposure studies

Characterization

- Porosity/bulk volume/grain volume/grain density
- Core gamma
- Permeability
- Relative permeability
- Optical profilometry

Environmental Chemistry Laboratory

The Environmental Chemistry Laboratory conducts groundbreaking work toward understanding the chemistry of water and carbon dioxide under pressurized super- and subcritical conditions. This knowledge base provides solutions for the CO₂ enhanced oil recovery and storage markets:

- Batch reaction vessels rated to 6000 psi and 350°C
- Multisample continuous exposure for extended durations
- Mixtures of CO₂ and H₂S routinely handled



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