

Abstract Submitted
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Small angle neutron (SANS) and X-ray scattering (SAXS) investigation of microstructure and porosity with fractal properties of coal, shale, and sandstone from Indiana NARAYAN CH DAS, HU CAO, H. KAISER, T.R. PRISK, PAUL E. SOKOL, Low Energy Neutron Source, Center for Exploration of Energy and Matter & Department of Physics, Indiana University, Bloomington, M. MASTALERZ, J. RUPP, Indiana Geological Survey, Indiana University, Bloomington — We have applied SAXS, SANS and adsorption isotherms to study the porosity, pore structure and interaction of confined fluids in the various Indiana rock samples. This study included a bituminous coal, a sandstone, and a grey shale from formations investigated as possible targets for CO₂ sequestration. SAXS and SANS are demonstrated quantitative information about the microstructure and pore morphology of the coals and other rocks at length scale (1 nm to 0.3 micron) as well as the fractal nature of pore matrix interfaces. The different scattering cross sections of X-rays and neutrons provide information on the distribution of pore sizes in organic and inorganic components. Neutrons are relatively sensitive to the presence of either hydrocarbons or water in the pores, and always give a smaller Porod exponent than that for X-ray. Construction of LENS was supported by the NSF, the 21st Century Science and Technology fund of Indiana, and the DOD. LENS operation is supported by Indiana University.

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