Abstract Submitted
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Natural Gas Storage on Nanoporous Carbon.[1] JACOB BURRESS, MIKAEL WOOD, SARAH BARKER, JOHN FLAVIN, CINTIA LAPILLI, Dept. of Physics, University of Missouri, Columbia, MO 65211, PARAG SHAH, GALEN SUPPES, Dept. of Chem. Engineering, University of Missouri, Columbia, MO 65211, PETER PFEIFER, Dept. of Physics, University of Missouri, Columbia, MO 65211 — Powdered and monolithic activated carbons have been made that have a large methane storage capacity (Alliance for Collaborative Research in Alternative Fuel Technology, http://all-craft.missouri.edu). The current best performer stores 115-119 grams methane per liter carbon at ambient temperature and 34 bar, compared to the DOE target of 118 g/L. Results are reported for the structure of the pore space (small angle x-ray scattering, nitrogen adsorption isotherms, methane adsorption isotherms, scanning and transmission electron microscopy), the methane binding energy (methane adsorption isotherms), and computer simulations of pore formation (probabilistic cellular automata). Most pores are centered about a width of 1.1 nm. At length scales larger than 100 nm, the samples are surface fractals with fractal dimension 2.4-2.6.

[1]NSF (EEC-0438469), University of Missouri, Midwest Research Institute, ED (GAANN), and DOE (W-31-109-Eng-38)

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