Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Hydrogen Adsorption on Nanoporous Biocarbon[1] M.B. WOOD, J.W. BURRESS, C.M. LAPILLI, P. PFEIFER, Dept. of Physics, University of Missouri, Columbia, MO 65211, P.S. SHAH, G.J. SUPPES, Dept. of Chemical Engineering, University of Missouri, Columbia, MO 65211, A.C. DILLON, P.A. PARILLA, National Renewable Energy Laboratory, Golden, CO 80401 — As a part of the Alliance for Collaborative Research in Alternative Fuel Technology (http://allcraft.missouri.edu) we study activated carbons made from corncob, optimized for storing methane and hydrogen (H2) by physisorption at low pressure. We report here: (a) storage capacities of 73-91 g H2/kg carbon at 77 K and 47 bar, validated in three different laboratories (the 2010 DOE target is 60 g H2/kg system); (b) binding energies from H2 adsorption isotherms (c) temperature-programmed desorption data; (d) degree of graphitization of the carbon surface from Raman spectra; (e) pore structure of carbon from nitrogen and methane adsorption isotherms, and small-angle x-ray scattering. The structural analysis shows that the carbon is highly microporous and that the pore space is highly correlated (micropores do not scatter independently).

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

Mikael Wood
Dept. of Physics, University of Missouri, Columbia, MO 65211

Date submitted: 20 Nov 2006 Electronic form version 1.4