Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Adsorbed Natural Gas Storage in Optimized High Surface Area Microporous Carbon JIMMY ROMANOS, TYLER RASH, ERIK NORDWALD, JOSHUA SHAWN SHOCKLEE, CARLOS WEXLER, PETER PFEIFER, University of Missouri — Adsorbed natural gas (ANG) is an attractive alternative technology to compressed natural gas (CNG) or liquefied natural gas (LNG) for the efficient storage of natural gas, in particular for vehicular applications. In adsorbants engineered to have pores of a few molecular diameters, a strong van der Walls force allows reversible physisorption of methane at low pressures and room temperature. Activated carbons were optimized for storage by varying KOH:C ratio and activation temperature. We also consider the effect of mechanical compression of powders to further enhance the volumetric storage capacity. We will present standard porous material characterization (BET surface area and pore-size distribution from subcritical N_2 adsorption) and methane isotherms up to 250 bar at 293K. At sufficiently high pressure, specific surface area, methane binding energy and film density can be extracted from supercritical methane adsorption isotherms. Research supported by the California Energy Commission (500-08-022).

Jimmy Romanos
University of Missouri

Date submitted: 14 Dec 2010 Electronic form version 1.4