Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Adsorption properties of amorphous carbon materials with a uniform pore network. RICHARD E. COOK, LILLIAN FRAZIER, SAMI CHANAA, ANDREA E. FREITAG, University of Tennessee, SHENG DAI, ZUO-JIANG LI, DAVID BEACH, ORNL CSD, JOHN Z. LARESE, Univ of Tennessee / ORNL CSD — There has been increasing interest in various forms of high surface area carbon materials, such as buckyballs, nanotubes, and carbon black, because of their potential applications as support for catalysts, electrode materials in fuel cells, gas storage devices and as a component of nano-composites. The underlying mechanism for most of these applications involves adsorption and transport of molecules on the carbon surface. Understanding the details of the interaction potential for different adsorbate molecules with these carbon materials is an important step for tailor-making application-specific materials. The adsorption properties of a carbon material with a uniform, close packed pore distribution of approximately 2.5nm were examined using high resolution adsorption isotherms with different adsorbates. By varying the size of the adsorbate molecule we hope to learn about the potential energy surface offered by these materials and gain a keen insight into the role played by the relative surface curvature on the adsorption properties. Volumetric adsorption isotherms of H2, D2, Ar, N2, H2O, CH4, and Xe were recorded and the results will be presented. Thermodynamic properties derived from these adsorption isotherms will also be discussed.

Richard E. Cook
University of Tennessee

Date submitted: 19 Dec 2005 Electronic form version 1.4