Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

GOFs and ZIFs: Experimental Results and Analysis of Carbon Dioxide Sorption JACOB BURRESS, JASON SIMMONS, NIST Center for Neutron Research, WEI ZHOU, University of Maryland, GADIPELLI SRINIVAS, JAMIE FORD, University of Pennsylvania, TANER YILDIRIM, NIST Center for Neutron Research — In recent years, growing concerns about global warming and the environment have spurred an accelerated development of materials technology for carbon dioxide (CO2) capture and storage. Two recent categories of materials being investigated for their CO2 storage capabilities are graphene oxide frameworks (GOFs) [1] and zeolitic imidazolate frameworks (ZIFs). We have synthesized graphene-oxide-frameworks (GOFs) by linking the OH groups on graphene oxide with benzene-boronic acids. Our initial GOF materials exhibit isosteric heats at low coverage of 32 kJ/mol for CO2. The nitrogen BET surface area of these initial materials is around 500 m2/g. Also, ZIFs are particularly useful for CO2 capture and storage due to high selectivities, CO2 uptakes and sample robustness. Neutron scattering and spectroscopic results of GOFs and select ZIFs with in-situ gas sorption will be presented. Neutrons are able to determine locations and strengths of binding sites. We will present detailed isotherms of carbon dioxide, methane and nitrogen at different temperatures of these interesting GOF and ZIF materials.
[1] J. W. Burress et al., Angewandte Chemie International Edition 49, 8902 (2010).

Jacob Burress
NIST Center for Neutron Research

Date submitted: 28 Dec 2010 Electronic form version 1.4