

## Craig M. BROWN

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### Professional Experience

Adjunct Professor, Chemical Engineering, U. Delaware 2012-  
Staff chemist, NIST Center for Neutron Research (NCNR) 2007-  
Staff Scientist, Indiana University Cyclotron Facility. 2005-2007  
Research Associate, Materials and Nuc. Eng., University of Maryland, College Park 1999-2005

### Education

D.Phil in Chemistry with Prof. K. Prassides Sussex University, U.K. 1999  
M.A. *Natural Science* University of Cambridge, U.K. 1998  
B.A. *Natural Science* University of Cambridge, U.K. 1995

### Professional Service

NSF Solid-State and Materials Chemistry funding panel 2011  
NIST Research Advisory Committee (Chair) 2010-  
NIST Research Advisory Committee 2008-2009  
Expert member of International Energy Agency-Hydrogen Task 22 2009-  
ORNL Neutron Scattering Science Review Committee (Chair) 2011-2013  
ORNL Neutron Scattering Science Review Committee 2009-2011  
NSF Experimental Physical Chemistry funding panel 2009  
Steering Committee, DOE-EERE Hydrogen Storage Center of Excellence 2008-2010  
Review committee for NCNR Instrument Control Software Systems (ICSS) 2008  
Conceptual Design Review panel of VISION spectrometer, ORNL 2007  
SNS Second Target Station Instrumentation Workshop, ORNL 2007  
Co-PI, NCNR DOE-EERE Hydrogen Storage Center of Excellence 2005-

[NSF: National Science Foundation; ORNL: Oak Ridge National Lab.; SNS: Spallation Neutron Source;  
DOE: Department of Energy; EERE: Energy Efficiency and Renewable Energy]

### Awards and Honors

Department of Commerce Silver Medal (2010);  
Neutron Scattering Society of America Science Prize (2010);  
Presidential Early Career Award for Scientists and Engineers, PECASE, (2009)

### Research Interests

Neutron scattering: structure-property relationships in complex materials; powder diffraction structure determination; magnetic structure determination; vibrational dynamics of materials and interplay with structure; diffusional dynamics and influence on function; porous materials for separations, gas adsorption; hydrogen storage; carbon dioxide capture.

### Selected Publications

- (1) Hydrogen Storage in a microporous metal-organic framework with exposed Mn<sup>2+</sup> coordination sites, *M. Dinca, W. S. Han, Y. Liu, A. Dailly, C. M. Brown, and J. R. Long*, *J. Am. Chem. Soc.*, 2006, 128, 51, 16876.
- (2) Observation of CuII-H<sub>2</sub> interactions in a fully-desolvated, sodalite-type metal-organic framework, *M. Dinca, A. Dailly, Y. Liu, C. M. Brown, D. A. Neumann and J. R. Long*, *Angewandte Chemie*, 2007, 46, 1419.
- (3) Quantum Rotation of Hydrogen in Single-Wall Carbon Nanotubes, *C. M. Brown, T. Yildirim, D. A; Neumann, M. J. Heben, T. Gennett, A. C. Dillon, J. L. Alleman and J. E. Fisher*, *Chem. Phys. Letts.*, 2000, 329, 311.
- (4) Neutron powder diffraction study of D<sub>2</sub> sorption in Cu<sub>3</sub>(1,3,5-benzenetricarboxylate)<sub>2</sub>, *V. K. Peterson, Y. Liu, C. M. Brown and Cameron Kepert*, *J. Am. Chem. Soc.*, 2006, 128, 15578.
- (5) High Capacity Hydrogen Adsorption in Cu(II) Tetracarboxylate Framework Materials: The Role of Pore Size, Ligand Functionalization, and Exposed Metal Sites, *X. Lin, I. Telepeni, A. J. Blake, A. Dailly, C. M. Brown, J. Simmons, M. Zoppi, G. S. Walker, K. M. Thomas, T. J. Mays, P. Hubberstey, N. R. Champness and M. Schroder*, *J. Am. Chem. Soc.*, 2009. 131, 2159).
- (6) Increasing the density of adsorbed hydrogen with coordinatively unsaturated metal centers in metal-organic frameworks, *Y. Liu, H. Kabbour, C. M. Brown, D. A. Neumann, and C. C. Ahn*, *Langmuir*, 2008, 24, 4772.
- (7) Hydrogen Adsorption in a Highly Stable Porous Rare-Earth Metal-Organic Framework: Sorption Properties and Neutron Diffraction Studies, *J. Luo, H. Xu, Y. Liu, Y. Zhou, L. L. Daemen, C. M. Brown, T. V. Timofeeva, S. Ma and H.-C. Zhou*, *J. Am. Chem. Soc.* 2008, 130, 9626.
- (8) A reversible structural transition of MIL-53 with temperature hysteresis, *Y. Liu, J.-H. Her, A. Dailly, A. J. Ramirez-Cuesta, D. A. Neumann and C. M. Brown*, *J. Am. Chem. Soc.* 2008, 130, 11813.
- (9) Inelastic neutron scattering of H<sub>2</sub> adsorbed in HKUST-1, *Y. Liu, C. M. Brown, D. A. Neumann, V. K. Peterson, and C. Kepert*, *J. Alloys Compounds*, 2007, 446-447, 385.
- (10) Hydrogen adsorption in HKUST-1: a Combined Inelastic Neutron Scattering and First-Principles Study, *C. M. Brown, Y. Liu, T. Yildirim, V. K. Peterson, and C. J. Kepert*, *Nanotechnology* 2009, 20 204025.

### Synergistic Activities

- (1) Contributed to the scientific success of numerous NCNR facility users through service as an instrument scientist on the Disk Chopper Spectrometer (DCS), one of the most successful neutron instruments of the last 20 years.
- (2) As an instrument scientist at the NCNR, I explain and develops neutron methods, data reduction and interpretation to/for scientists with a variety of education levels and experience with an emphasis on graduate and postgraduate students.
- (2) Lead in designing, implementing and executing experiments and tutorials for the week-long NCNR Summer School on Fundamentals of Neutron Scattering and the Spectroscopy Tutorial series which alternate yearly, with an emphasis on graduate and postgraduate students (started in 1999.)
- (3) Supervised 4 postdoctoral fellows: 2 current; 1 staff member at U. Delaware; 1 staff scientist at G.E.
- (5) Over the course of my independent career, I have supervised research projects for 4 undergraduate students resulting in 2 peer-reviewed publications.