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Engineering & Scientific Consulting

John McGann, Ph.D.

Senior Managing Scientist | Polymer Science and Materials Chemistry
Natick
+1-508-652-8521 | jmcgann@exponent.com

Professional Profile

Dr. McGann is a physical chemist with a background in energy storage systems. He primarily provides consulting support for issues related to lithium-ion batteries and battery-containing systems.

Dr. McGann advises clients in a variety of industries, including consumer electronics, energy storage systems, power tools, and e-mobility, covering small to large form factor batteries. His battery expertise spans the life cycle of a battery, from design, product integration and manufacturing quality control, through performance testing, abuse testing and failure analysis. He also supports clients in recall situations and litigation matters such as trade secret and intellectual property cases.

Dr. McGann also routinely provides consulting support to clients requiring nondestructive analysis using computed tomography (CT) X-ray scanning for polymeric, metallic or composite components and systems, microscopic and macroscopic. He applies his experience to a range of project types, including litigation support, product design, defect detection, part to CAD analysis, failure analysis, quality control, accident investigations and many others.

Prior to joining Exponent, Dr. McGann was a postdoctoral associate at the Massachusetts Institute of Technology, where he worked on the development of solar thermal fuels, a class of organic molecules that store solar energy for future on-demand use as heat. His graduate research at Carnegie Mellon University was centered on highly-ordered nanoporous carbon materials derived from the pyrolysis of block copolymer precursors for improved energy storage devices, including lithium-ion batteries and supercapacitors. Using a combination of characterization studies and computational modeling, he developed a multi-scale understanding of the heterogeneous material that was employed to optimize its performance in devices. Dr. McGann also has worked at Bayer MaterialScience, where he worked on the processing of carbon nanotubes as well as polymeric materials for antifouling coatings..

Academic Credentials & Professional Honors

Ph.D., Chemistry, Carnegie Mellon University, 2012

B.A., Chemistry, Colgate University, 2006

Prior Experience

Postdoctoral Associate, MIT, 2012-2015

Intern, Bayer Material Science, 2010, 2009

Patents

US Patent Application: 13/390470: Procedures for development of specific capacitance in carbon structures, August 17, 2010 (Tomasz Kowalewski, Eun Kyung Kim, John P. McGann, and Krzysztof Matyjaszewski).

Publications

Zhong M, Kim EK, McGann JP, Chun S-E, Whitacre JF, Jaroniec M, Matyjaszewski K, Kowalewski T. Electrochemically active nitrogen-enriched nanocarbons with well-defined morphology synthesized by pyrolysis of self-assembled block copolymer. *Journal of the American Chemical Society* 2012; 134:14846-14857.

McGann JP, Zhong M, Kim EK, Natesakhawat S, Jaroniec M, Whitacre JF, Matyjaszewski K, Kowalewski T. Block copolymer templating as a path to porous nanostructured carbons with highly accessible nitrogens for enhanced (electro) chemical performance. *Macromolecular Chemistry and Physics* 2012; 213:1078-1090.

Kim K, Zhong M, McGann J, Chun S, Whitacre J, Jaroniec M, Matyjaszewski K, Kowalewski T. Nitrogen-rich nanocarbon with well-defined morphology synthesized by block copolymer templating. *Polymer Preprints* 2012; 53(1):227.

Kowalewski T, McGann JP, Yaron D, McCullough LA, Matyjaszewski K. Nanocarbons with tunable electronic structure from well-defined copolymers containing polyacrylonitrile prepared by atom transfer radical polymerization. *Polymer Preprints* 2008; 49(2):202.

Aimi J, McCullough LA, McGann J, Kowalewski T, Matyjaszewski K. Synthesis of poly(vinylacetylene) block copolymers as precursors for nanocarbon materials. *Polymer Preprints* 2008; 49(2):343-344.

McGann JP, McCullough LA, Matyjaszewski K, Kowalewski T. Mass spectroscopic investigations of nanostructured carbon derived from poly(n-butyl acrylate)-b-polyacrylonitrile copolymers. *Polymer Preprints* 2008; 49(2):185-186.

O'Brien AY, McGann JP, Geier GR. Dipyrromethane + Dipyrromethanedicarbinol routes to an electron deficient meso-substituted phlorin with enhanced stability. *Journal of Organic Chemistry* 2007; 72:4084-4092.

Presentations

McGann JP. Lithium Ion Cell Construction – Beyond the Standards. PlugVolt 2019 Battery Seminar, July 16-18, 2019.

McGann JP, Amatya R. Overview of Indian energy sector. MIT - IITB TataCenter 2014 Conference, Mumbai, India, August 18-20, 2014.

McGann JP, Kucharski TJ, Cho E, Nocera DG, Grossman JC. Synthesis and structural characterization of azobenzenes templated on various substrates for solar thermal fuels. *Materials Research Society Spring Meeting*, San Francisco, CA, April 21-25, 2014.

Grossman JC, McGann JP, Kucharski T. HybriSol hybrid nanostructures for high-energy-density solar thermal fuels. *ARPA-E Energy Innovation Summit*, Washington, D.C., February 24-26, 2014.

Grossman JC, McGann JP, Kucharski T. HybriSol hybrid nanostructures for high-energy-density solar thermal fuels. *ARPA-E Energy Innovation Summit*, Washington, D.C., February 25-27, 2013.

Grossman JC, McGann JP, Kucharski T, Yoo JS. HybriSol hybrid nanostructures for high-energy-density

solar thermal fuels. ARPA-E Energy Innovation Summit, Washington, D.C., February 27-29, 2012.

McGann JP, Kim EK, McCullough L, Matyjaszewski K, Kowalewski T. Porous carbon materials from block copolymer precursors for supercapacitor applications. Materials Research Society National Meeting Spring Meeting, San Francisco, CA, April 5-9, 2010.

Young T, Balliet C, Incorvati J, Daniels E, Smilgies D-M, McCullough RD, Kowalewski K. Molecular packing defects in regioregular poly(3-hexylthiophenes) and their impact on the nanostructure of bulk heterojunction solar cells. Materials Research Society Spring Meeting, San Francisco, CA, April 5-9, 2010. (Substitute Presenter).

Kim EK, Zhong M, McGann JP, Matyjaszewski K, Whitacre JF, Kowalewski T. Porous carbon materials from block copolymer precursors for supercapacitor applications. 240th ACS National Meeting, Boston, MA, August 22-26, 2010.

McGann JP, McCullough LA, Bier ME, Matyjaszewski K, Kowalewski T. Mass spectroscopic studies of porous nanographenes from block copolymer precursors. 238th ACS National Meeting, Washington, D.C., August 16-20, 2009.

McGann JP, Welch ZR, Matyjaszewski K, Yaron DJ, Kowalewski T. Modeling the effects of edge substituents on the electric properties of graphenes. 238th ACS National Meeting, Washington, D.C., August 16-20, 2009.

McGann JP, Kim EK, McCullough LA, Matyjaszewski K, Kowalewski T. Porous nanographenes with the nanostructure templated by self-assembling block copolymer precursors. 238th ACS National Meeting, Washington, D.C., August 16-20, 2009.

McGann JP, Kowalewski T. Porous nanographenes derived from self-assembling macromolecular precursors. Bayer BMS, Pittsburgh, PA, June 2009.

McGann JP, Kowalewski T, Yaron D. Tunability of electronic structure in nanocarbons derived from block copolymer precursors. Gordon Research Conference: Chemistry of Electronic Materials, Mount Holyoke College, South Hadley, MA, July 22-27, 2007.

McGann JP, Kowalewski T, Smilgies D. GISAXS/GIWAXS studies of nanostructured carbons derived from self-assembling macromolecular precursors. Cornell High Energy Synchrotron Source User Meeting, Cornell University, Ithaca, NY, June 2007.

McGann JP, Geier GR. Survey of two-step, one-flask reactions of 5,5-dimethyldipyrromethane with dipyrromethanecarbinol species bearing pentafluorophenyl substituents. 231st ACS National Meeting, Atlanta, GA, March 26-30, 2006.