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AFFILIATIONS

Department of Engineering, Penn State Dubois
Materials Research Institute, The Pennsylvania State University
Department of Energy and Mineral Engineering, The Pennsylvania State University

EDUCATION

Doctor of Philosophy, Materials Science and Engineering, University of Cincinnati 2002
M.S., Materials Science and Engineering, University of Cincinnati 1999
Bachelor of Engineering, Mechanical Engineering, NIT Warangal (India) 1997

TEACHING

- **MATSE413: Solid State Materials** – The course provided an understanding of fundamental phenomena in solid state materials.
- **ENGR350: Computation and Modeling Methods** – The course provided theoretical understanding and hands-on experience of the modeling techniques used in engineering practice.
- **EGEE101: Energy and Environment** - The course introduced the concept of various forms of energy and their influence on our society in terms of energy utilization and environmental impacts
- **ME597K: High power energy storage** - The course provided basic electrochemical concepts and gave an overview of the current state-of-the-art battery and capacitor technologies

PEER REVIEWED PUBLICATIONS

1. "Formation of stable SEI layer due to electrolyte additives and its effect on high voltage electrochemical stability of activated carbon electrodes", W. Qu, E. Dorjpalam, R. Rajagopalan* and C.A. Randall submitted to **ChemSusChem**.
2. "Ultrahigh power flexible electrochemical capacitors using binder free single walled carbon nanotube electrodes and hydrogel membranes, J. Kalupson, D. Ma, C.A. Randall, R. Rajagopalan and K. Adu, **The Journal of Physical Chemistry C** (accepted online)
3. "Synthesis of electroactive manganese oxide thin films by plasma enhanced chemical vapor deposition" A.R. Merritt, R. Rajagopalan and J.D. Carter, **Thin Solid Films** (accepted online)
4. "On the effects of confinement within a catalyst consisting of platinum embedded within nanoporous carbon for the hydrogenation of alkenes" M. Peer, A. Qajar, R. Rajagopalan and H.C. Foley, **Carbon** 66, 459 – 466 (2014).
5. "Characterization of micro- and mesoporous materials using accelerated dynamics adsorption" A. Qajar, M. Peer, R. Rajagopalan and H.C. Foley, **Langmuir** 29, 12400 - 12409 (2013).

6. "Preparation and characterization of ultrathin free-standing carbon films" H. Lee and R. Rajagopalan, **Journal of the Korean Physical Society**, 63, 1859 -1863 (2013)
7. "Surface Compression of Light Adsorbates inside Microporous PFA-derived Carbons", A. Qajar, M. Peer, R. Rajagopalan, Y. Liu, C. Brown and H.C. Foley, **Carbon**, 60, 538-549 (2013).
8. "Platinum embedded within carbon nanospheres for shape selective liquid phase hydrogenation reactions" M. Peer, A.Qajar, B.P.M. Holbrook, R. Rajagopalan and H.C. Foley, **Carbon**, 57, 485 (2013).
9. "Localized crystallization of polyfurfuryl alcohol derived carbon by alkali metals" K.W. McNamara, P. Ayyappan, R. Rajagopalan, J.G. Chen and H.C. Foley, **Carbon** 56, 109 (2013).
10. "Shape selective carbon catalysts for liquid phase reaction: Study of olefin hydrogenation using platinum embedded nanoporous carbon" B.P.M. Holbrook, R. Rajagopalan, K. Dronavajjala, *Y.K. Choudhary* and H.C. Foley, **Journal of Molecular Catalysis A: Chemical**, 367, 61-68 (2013).
11. "On the effects of emulsion polymerization of furfuryl alcohol on the formation of carbon spheres and other structures derived by pyrolysis of polyfurfuryl alcohol" M. Peer, A. Qajar, R. Rajagopalan and H.C. Foley, **Carbon**, 51, 85 – 93 (2013).
12. "Selective adsorption of nitrate esters with nanostructured carbons", A.R. Merritt, R. Rajagopalan and N.J. Trivedi, **RSC Advances**, 2, 12298-12304 (2012).
13. "High pressure adsorption apparatus: Design and error analysis" A. Qajar, R. Rajagopalan and H.C. Foley, **International Journal of Hydrogen Energy**, 37, 9123-9126 (2012).
14. "Synthesis of boron/nitrogen substituted carbons for aqueous asymmetric capacitors", *T. Tomko*, R. Rajagopalan*, P. Aksoy and H.C. Foley, **Electrochimica Acta** , 56, 5369 -5375 (2011).
15. "High energy density capacitor using coal tar pitch derived nanoporous carbon/MnO2 electrodes in aqueous electrolytes", *T. Tomko*, R. Rajagopalan*, M.T. Lanagan and H.C. Foley, **Journal of Power Sources**, 196, 2380 –2386 (2011).
16. "Effects of interfacial modifications on electrical properties of laminar composite dielectrics", P. Tewari, R. Rajagopalan*, E. Furman, M.T. Lanagan", **Langmuir**, 26, 18817-18823 (2011).
17. "Effect of pyrolysis temperature on the microstructure of disordered carbon nanowires, B.A. Samuel, R. Rajagopalan, H.C. Foley and M.A. Haque", **Thin Solid Films,** 519, 91 – 95 (2010).
18. "Room temperature amorphous to nanocrystalline transformation in ultra thin films under tensile stress: an in-situ TEM study, M.P. Manoharan, S. Kumar, M.A. Haque, R. Rajagopalan and H.C. Foley", **Nanotechnology**, 21, 505707 (2010).
19. "Chemical stability of glass with an ultra thin disordered carbon coating" H. Lee, R. Rajagopalan* and C.G. Pantano, **Journal of Non-Crystalline Solids,** 356, 263-269 (2010).
20. "Elastic properties of 4-6 nm thick glassy carbon thin films" M.P. Manoharan, H. Lee, R. Rajagopalan, H.C. Foley and M.A. Haque, **Nanoscale Research Letters**, 5, 14 -19 (2010).
21. "High temperature rearrangement of disordered nanoporous carbon at the interface with single wall carbon nanotubes" B. Yi, R. Rajagopalan, C.L. Burket, X. Liu, P.C. Eklund and H.C. Foley, **Carbon**, 47, 2303-2309 (2009)**.**
22. "Processing and characterization of ultrathin carbon coatings on glass" H. Lee, R. Rajagopalan, J. Robinson, C.G. Pantano, **ACS Applied Materials and Interfaces**, 1, 927-933 (2009).
23. "Control of interfaces on electrical properties of SiO2-Parylene-C laminar composite dielectrics" P. Tewari, R. Rajagopalan, E. Furman and M.T. Lanagan, **Journal of Colloid and Interface Science**, 332, 65-73 (2009).

24. "Surface initiated growth of Poly (ethyl 2-cyanoacrylate) nanofibers on surface-modified glass substrates" P.J. Mankidy, R. Rajagopalan, C.G. Pantano and H.C. Foley, **Chemistry of Materials**, 21, 831-842 (2009).
25. "Overcoming the barrier to graphitization in a polymer-derived nanoporous carbon", C.L. Burket, R. Rajagopalan and H.C. Foley, **Carbon,** 46, 501-510 (2008).
26. "Influence of initiators on the growth of Poly(ethyl 2-cyanoacrylate) nanofibers" P.J. Mankidy, R. Rajagopalan and H.C. Foley, **Polymer**, 49, 2235 – 2242 (2008).
27. "Temperature effects on electrical transport in semiconducting carbonaceous nanowires" **Nanotechnology**, 19, 275702 (2008**).**
28. "Synthesis of nanoporous carbon with pre-graphitic domains", C.L. Burket, R. Rajagopalan and H.C. Foley, **Carbon**, 45, 2307-2320 (2007).
29. "High performance nanoporous carbon membranes and their application in gas separation", A. Merritt, R. Rajagopalan and H.C. Foley, **Carbon**, 45, 1267-1278 (2007).
30. "Mechanical testing of pyrolyzed polyfurfuryl alcohol nanofibers", B.A. Samuel, B. Yi, R. Rajagopalan, H.C. Foley and M.A. Haque, **Nanotechnology**, 18, 115704 (2007).
31. "A simple technique to grow polymer brushes using in-situ surface ligation of an organometallic initiator", K.D. Dronavajjala, R. Rajagopalan, S. Uppili, A. Sen, D.L. Allara and H.C. Foley, **Journal of the American Chemical Society**, 128, 13040-13041 (2006).
32. "Catalytic polymerization and facile grafting of polyfurfuryl alcohol to single walled nanotubes-Preparation of nanocomposite carbon", B. Yi, R. Rajagopalan, H.C. Foley, U.J. Kim, X.M. Liu and P.C. Eklund, **Journal of the American Chemical Society,** 128, 11307-11313 (2006).
33. "Genesis of porosity in polyfurfuryl alcohol derived carbons", C.L. Burket, R. Rajagopalan, *A.P. Marencic*, K.D. Dronavajjala and H.C. Foley, **Carbon,** 44, 2957-2963 (2006).
34. "Modification of macroporous stainless steel supports with silica nanoparticles for size selective carbon membranes with improved flux", R. Rajagopalan, A. Merritt, *A. Tseytlin* and H.C. Foley, **Carbon**, 44, 2051-2058 (2006).
35. "Facile growth of cyanoacrylate nanofibers", P.J. Mankidy, R. Rajagopalan and H.C. Foley, **Chemical Communication,** 10, 1129-1141 (2006).
36. "Molecular sieving platinum nanoparticle catalysts kinetically frozen in nanoporous carbon", R. Rajagopalan, A. Ponnaiyan, P.J. Mankidy, *A.W. Brooks*, B. Yi and H.C. Foley, **Chemical Communication,** 21, 2498-2499 (2004).
37. "Electrochemical synthesis : A novel technique for processing multifunctional coatings", **Progress in Organic Coatings**, J.O. Iroh, Y.R Zhu, K. Shah, K. Levine, R. Rajagopalan, T. Uyar, M. Donley, R. Mantz, J. Johnson, N.N. Veovodin, V.N. Balbyshev, A.N. Khramovb, 47, 365-375 (2003).
38. "Characterization of Polyaniline-polypyrrole composite coatings on low carbon steel: A XPS and Infrared Spectroscopy Study", R. Rajagopalan and J.O. Iroh, **Applied Surface Science**, 218, 58-69 (2003).
39. "Adhesion performance of polyaniline-polypyrrole composite coatings on low carbon Steel", R. Rajagopalan and J.O. Iroh, **Journal of Adhesion**, 78, 835-860 (2002).
40. "Corrosion performance of low carbon steel coated with conducting polymeric Composites" R. Rajagopalan and J.O. Iroh, **Surface Engineering**, 18, 59-63 (2002).
41. "Pretreatment and coatings of low carbon steel by constant potential electrochemical Process", R. Rajagopalan and J.O. Iroh, **Surface Engineering**, 18, 53-58 (2002).
42. "A One-step electrochemical synthesis of polyaniline-polypyrrole composite coatings on carbon fibers", R. Rajagopalan and J.O. Iroh, **Electrochimica Acta**, 47, 1847-1855 (2002).
43. "Electrochemical deposition of Polyaniline-polypyrrole composite coatings on Aluminum", **Journal of Applied Polymer Science**, G.S. Akundy, R. Rajagopalan and J.O. Iroh, 83, 1970-1977 (2002).

44. "Electrochemical copolymerization and characterization of aniline and isoprene on low carbon steel using toluenesulfonic acid monohydrate as electrolyte", J.O. Iroh and R. Rajagopalan, **Journal of Applied Polymer Science**, 84, 184-192 (2002).
45. "Development of polyaniline-polypyrrole composite coatings on steel by aqueous electrochemical process", R. Rajagopalan and J.O. Iroh, **Electrochimica Acta**, 46, 2443-2455 (2001).
46. "Electrochemical synthesis of polyaniline-polypyrrole composite coatings on carbon fibers in aqueous toluene sulfonate solution", J.O. Iroh and R. Rajagopalan, **Surface Engineering**, 16, 481 (2000).
47. "Characterization of conducting composite coating formed on steel by aqueous electrochemical process" J.O. Iroh and R. Rajagopalan, **Surface Engineering**, 16, 321 (2000).
48. "Electrochemical polymerization of aniline on carbon fibers in aqueous toluene sulfonate solution" J.O. Iroh and R. Rajagopalan, **Journal of Applied Polymer Science**, 76, 1503 (2000).

PROCEEDING PAPERS

1. "Enhanced performance in flexible binder free SWCNT membrane EDLC" **Bulletin of the American Physical Society** 58 (2013)*.
2. "Enhanced performance of symmetric double layer capacitor by flexible binder-free SWCNT membrane electrodes" **MRS Proceedings** 1505 (2013)*.
3. "Liquid phase alkene hydrogenations over platinum in nanoporous carbon" **Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry** 53, 466-467 (2008).
4. "Effect of interfacial modification on electrical properties of laminated organic-inorganic composite insulators" **IEEE International Symposium on Electrical Insulation**, 312-315 (2008)
5. "Fabrication of electrochemical double layer capacitors using carbon derived from coal tar pitch/polyethylene glycol blends" **Proceedings of the International Coal Utilization & Fuel Systems, 32nd Vol.1**, 559-562 (2007)*.
6. "Synthesis of polyphenylacetylene brushes on substrates using anchored organometallic catalysts", **PMSE preprints**, 96, 861 (2007).
7. "Mechanical characterization of polymer nanowires using MEMS", **Proceedings of 2006 ASME International Mechanical Engineering Congress and Exposition**, 507 – 510 (2007).
8. "Carbon membranes – a viable technology for the recovery and purification of hydrogen gas" **Materials Research Society Symposium Proceedings**, 971, 25 -29 (2006).
9. "A simple method to grow polymer nanofibers from superglue" **Materials Research Society Symposium Proceedings**, 948, 8 – 12 (2006).
10. "Novel nanoporous carbon derived from coal tar pitch/polyethylene glycol blends as electrodes for ultracapacitors" **Materials Research Society Symposium Proceedings**, 973, 129 -133 (2006)*.
11. "Template-less growth of high aspect ratio poly ethyl 2-cyanoacrylate nanofibers", **PMSE preprints**, 94, 290 (2006).
12. "Polymer brushes from an organometallic catalyst immobilized on a gold surface", **PMSE preprints**, 94, 715 (2006).

13. "Preparation and characterization of NPC/SWNT nanocomposite", **Materials Research Society Symposium Proceedings**, 963, 285 -289 (2006).
14. "Synthesis and characterization of F-SWNT/NPC nanocomposites", **2005 *AIChE* Annual Meeting Conference Proceedings**, p 13693 (2005).
15. "Study of permselectivity of gases through silica/carbon nanocomposite membranes", **Proceedings of Eighth International Conference on Inorganic Membranes**, 98-101 (2004).
16. "Using nanoporous carbon membranes in fuel cells" Materials Research Society Symposium Proceedings, **Materials and Technology for Hydrogen Economy**, 801, 185-190 (2003).
17. "Porous carbon nanoturf using anodized alumina templating" **Materials Research Society Symposium Proceedings**, 788, 277-282 (2003).
18. "Study of the effect of hydrogen on Pt supported nanoporous carbon derived from polyfurfuryl alcohol" **Materials Research Society Symposium Proceedings**, 756, 371-377 (2003).
19. "Study of the dispersion of platinum nanoparticles in nanoporous carbon" **Microscopy and Microanalysis,** 9, 422-423 (2003).
20. "Study of the effect of morphology of nanoporous carbon membranes on permselectivity" **Materials Research Society Symposium Proceedings**, 752, 225-230 (2003).
21. "Formation of bilayer polypyrrole-polyaniline composite coating for corrosion protection of steel", **Surface Modification Technologies XV, Proceedings of the International Conference on Surface Modification Technologies**, 135 -142 (2002).
22. "Structural characterization of polyaniline-polypyrrole composite coatings" **PMSE pre-prints**, 85, 316 (2001).
23. "Determination of the mechanism of formation of polypyrrole on reactive metals by infrared spectroscopy" **ANTEC'99, Plastics bridging the millennia**, 2511 -2515 (1999).

PATENT/PATENT APPLICATIONS

- Filed a US patent (WO 2012 /138403) on "Composite ionic conducting electrolytes"
- Filed a US patent (WO 2011/046594) on "High energy density ionic dielectric materials and devices"
- Filed a US patent (US 2011/0085279) on "Self healing high energy glass capacitors"
- Filed a US patent (US 2007/0253887) on "A method for the synthesis of porous carbon materials"
- Filed a US patent (US 2006/027912) on "Fabrication of selective carbon nanocomposite membranes with excellent gas permeability"
- Filed an invention disclosure on "Method for synthesizing electrochemically active manganese oxide thin films by plasma enhanced chemical vapor deposition (PECVD)"
- Filed an invention disclosure at Intellectual property Office at Penn State on " Design of electrolytes for high voltage electrochemical capacitors"
- Filed an invention disclosure at Intellectual property Office at Penn State on " A pressure control technique for accelerated gas adsorption with volumetric and gravimetric adsorption measurements"