

NANOSCIENCE AND ENGINEERING RESEARCH CENTER (NSEC)



**Center for High-rate
Nanomanufacturing**

2009-2010 ANNUAL REPORT (Year 6)

NSF CENTER FOR HIGH-RATE NANOMANUFACTURING



Northeastern University

University of Massachusetts Lowell

University of New Hampshire

Michigan State University

NSF Award# 0832785

1. Adams, G., Nagappan, P. and McGruer, N. "Continuum Modeling and Analysis of the Frictional Interaction Between a CNT and a Substrate During Dragging," *Journal of Tribology*, Vol. 131, No. 3, 2009, 032002. <http://tribology.asmedigitalcollection.asme.org/article.aspx?articleid=1485058>
2. Ashter, A, Tsai, S-J, Jun S. Lee, Ellenbecker, M.J., Mead, J.L., Barry, C.F., Effects of Nanoparticle Feed Location during Nanocomposite Compounding, *Polymer Engineering and Science*, 50(1), 154-164 (2010) <http://onlinelibrary.wiley.com/doi/10.1002/pen.21499/abstract>
3. Bello D, Hsieh,SF, Schmidt, D, Rogers, E. Nanomaterials properties vs. biological oxidant damage: Implications for toxicity screening and exposure assessment. *Nanotoxicology*, 3(3) 249-61; 2009.
4. Bello D, Wardle, BL,Zhang, J., Yamamoto, N, Santeufemio, C., Hallock, M., MA Virji: Charatcerization of exposures to nanoscale particles and fibers during drilling of hybrid advanced composites containing carbon nanotubes. *Int J Occup Env Health*, 2010, special issue on occupational exposure to engineered nanomaterials. Accepted. <http://www.ncbi.nlm.nih.gov/pubmed/21222387>
5. Berezutskiy, G., Lucas-Hurt L., Bubnis, G.J. and Mayne, H. R. "A model study of adlayer pattern formation on hexagonal substrates," Book of Abstracts, NERM Meeting. American Chemical Society, (2009) p 214.
6. Briggs, J. B.; Jazdyk, M. D.; Miller, G. P. "2,3-Bis(bromomethyl)-1,4-diphenylbenzene," *Acta Cryst.*, 2010, E66, o12 https://www.researchgate.net/publication/51134324_23-Bisbromomethyl-14-diphenylbenzene
7. Briggs, J. B.; Jia, W.; Jazdyk, M. D.; Miller, G. P. "2,5-Dichlorothiophene 1,1-dioxide," *Acta Cryst.*, 2009, E65, o3258. <http://journals.iucr.org/e/issues/2009/12/00/fl2274/fl2274.pdf>
8. Briggs, J. B.; Jazdyk, M. D.; Miller, G. P. "1,2-Dimethyl-4,5-diphenylbenzene determined on a Bruker SMART X2S benchtop crystallographic system," *Acta Cryst.*, 2009, E65, o1171. http://scholars.unh.edu/cgi/viewcontent.cgi?article=1000&context=chemistry_fac_pub
9. Bubnis, G.J. and Mayne, H. R. "Modeling Hydrogen Bond Driven Molecular Pattern Formation on Au(111)," Book of Abstracts, NERM Meeting. American Chemical Society, (2009) p 215.
10. Bubnis, G.J. and Mayne, H. R., "A modeling study of the self assembly of various hydrogen-bonding functionalized fullerenes on Au(111)," *J. Chem. Phys.* (submitted, April 2010) <http://pubs.acs.org/doi/abs/10.1021/jp104104b>
11. Bubnis, G.J.; Cleary, S. M. ; Mayne, H. R., "Self-Assembly and structural behavior of a model rigid C60 -terminated thiolate on Au(111)," *Chem. Phys. Letters* 470, 289 (2009) <http://www.sciencedirect.com/science/article/pii/S0009261409001110>
12. Bubnis, G. J.; Mayne, H. R., "Structures of binary C60/C84.fullerene clusters," *J. Phys Chem. A* 113, 4598 (2009) <http://www.ncbi.nlm.nih.gov/pubmed/19371120>
13. Casse, B., Lu, W., Banyal, R. Huang, Y., Selvarasah, S., Dokmeci, M., Perry, C. and Sridhar, S."Imaging with Subwavelength Resolution by a Generalized

- Superlens at Infrared Wavelengths,” *Optics Letters*, vol. 34, no.13, pp. 1994-1996, 2009
https://www.osapublishing.org/view_article.cfm?gotourl=https%3A%2F%2Fwww%2Eosapublishing%2Eorg%2FDirectPDFAccess%2F62F8A1B8-DCBF-F175-3880464C5A5F9CBE_183012%2Fol-34-13-1994%2Epdf%3Fda%3D1%26id%3D183012%26seq%3D0%26mobile%3Dno&org=Northeastern%20University%20Snell%20Library
14. Cha, N; Echegoyen, Y; Park, J; Busnaina, A; Kim, T, "Convective Assembly and Dry Transfer of Nanoparticles using Hydrophobic/Hydrophilic Monolayer Templates", *Lagmuir, Journal of ACS*, 2009, 25 (19), pp 11375–11382. DOI: 10.1021/la901496s (2009) <http://pubs.acs.org/doi/abs/10.1021/la901496s>
 15. Chandekar, A., Sengupta,S., Whitten,J.E., “Thermal stability studies of thiol and silane monolayers: A comparative study”, *Appl. Surf. Sci.*, 256, 2742-2749 (2010). <http://www.sciencedirect.com/science/article/pii/S0169433209016092>
 16. Chen, C., Agarwal, V., Sonkusale, S. and Dokmeci, M.“The Heterogeneous Integration of Single-Walled Carbon Nanotubes onto Complementary Metal Oxide Semiconductor Circuitry for Sensing Applications,” *Nanotechnology*, 20, pp. 225302, June 2009. <http://iopscience.iop.org/article/10.1088/0957-4484/20/22/225302;jsessionid=87F7508E8865EFA54F065B71E78CF7A2.c1.iopscience.cld.iop.org>
 17. Chen, C.-L., Yang, C.-F., Agarwal, V., Kim, T., Sonkusale,S., Busnaina,A., Chen, M. and Dokmeci, M. “DNADecorated Carbon-Nanotube-based Chemical Sensors on Complementary Metal Oxide Semiconductor Circuitry,” *Nanotechnology*, 21, pp. 095504, 2010. <http://iopscience.iop.org/article/10.1088/0957-4484/21/9/095504/meta>
 18. Cherchi, C.s, Chernenko, T., Diem M. and Gu A. Z.* (2010) “Impact of nTiO2 Exposure on Cellular Structure of *Anabaena variabilis* and Evidence of Bio-uptake.” *Environmental Science and Technology*. <http://onlinelibrary.wiley.com/doi/10.1002/etc.445/abstract>
 19. Chiota, J., Shearer, J., Wei, M., Barry, C., and Mead, J., "Multiscale Directed Assembly of Polymer Blends Using Chemically Functionalized Nanoscale-Patterned Templates," *Small* Vol. 5, No. 24, pp.2788-2791 (2009). <http://onlinelibrary.wiley.com/doi/10.1002/sml.200901530/abstract>
 20. Choi,J., Prasad,Y., Kim,I., Kim, I., Kim,W., Busnaina, A. and Park,J. "Analysis of Scratches Formed on Oxide Surface during Chemical Mechanical Planarization", *Journal of The Electrochemical Society*, 157 (2) H186-H191 (2010) <http://jes.ecsdl.org/content/157/2/H186.short>
 21. Chourb S, Mackness BC, Farris LR, McDonald MJ. Enhanced Immuno-Detection of Shed Extracellular Domain of HER-2/neu. *HEALTH* 1:325-329; 2009 <http://www.scirp.org/journal/PaperInformation.aspx?PaperID=1126>
 22. Chun, H., Hahm, M., Homma, Y., Meritz, R., Kuramochi,K., Menon,L., Ci, L., Ajayan, P., and Jung,Y. “Engineering Low-aspect Ratio Carbon Nanostructures:Nanocups, Nanorings, and Nanocontainers“, *ACS Nano*, 3, 1274 (2009) [IF: 5.472] <http://pubs.acs.org/doi/abs/10.1021/nn9001903>
 23. Chung, Y., Murmann, B., Selvarasah, S., Dokmeci, M. and Bao, Z. “Low-voltage and Short-channel Pentacene FieldEffect Transistors with Top-contact Geometry

- Using Parylene-C Shadow Masks,” Applied Physics Letters, vol. 96, 1, 2010.
<http://scitation.aip.org/content/aip/journal/apl/96/13/10.1063/1.3336009>
24. Clarizia LJA, Sok D, Wei M, Mead J, Barry,C., McDonald MJ. Antibody Orientation Enhanced By Selective PolymerProtein Noncovalent Interactions. Anal Bioanal Chem 393:1531-1538; 2009
<http://link.springer.com/article/10.1007%2Fs00216-008-2567-x>
 25. Diaconescu, B.; Yang, T.; Berber, S.; Jazdyk, M.; Miller, G. P.; Tománek, D.; Pohl, K., “Molecular self-assembly of functionalized fullerenes on a metal surface,” Phys. Rev. Lett., 2009, 102, 056102-1 - 056102-4.
 26. Fang L., Wei, M., Shang Y., Jimenez L., Kazmer D., Barry, C., and Mead, J., "Surface Morphology Alignment of Block Copolymers Induced by Injection Molding" Polymer, Vol. 50, Issue. 24, pp.5837-5845 (2009).
<http://www.sciencedirect.com/science/article/pii/S0032386109007708>
 27. Gou, Ns., Onnis-Hayden, As. and Gu, A.Z.* (2010) “Mechanistic Toxicity Evaluation of Nanomaterials via Prokaryotic Gene Expression Profiling”. Environmental Science and Technology, (under review).
<http://pubs.acs.org/doi/abs/10.1021/es100679f>
 28. Hahm, M., Kwon, Y., Busnaina, A., and Jung, Y. “Structure Controlled Synthesis of Vertically Aligned Carbon Nanotubes using Thermal Chemical Vapor Deposition Process”, Journal of Heat Transfer, (2010) Accepted [IF: 1.421]
https://www.researchgate.net/publication/232262407_Structure_Controlled_Synthesis_of_Vertically_Aligned_Carbon_Nanotubes_Using_Thermal_Chemical_Vapor_Deposition_Process
 29. Hsieh SF, Bello D, Schmidt D, Rogers, EJ: Biological oxidative damage as a predictor of potential toxicity of engineered nanoparticles. Toxicology in vitro, submitted. 2010.
 30. Hu, S., Kim, T.H, Park, J.G, and Busnaina, A. A., “Effect of Different Deposition Mediums on the Adhesion and Removal of Particles,” Journal of The Electrochem Soc, 157 (6), (2010). <http://jes.ecsdl.org/content/157/6/H662.short>
 31. Isaacs, J. A., Tanwani,A., Healy, M., Dahlben, L. J. “Economic Assessment of Single-Walled Carbon Nanotube Processes”, /Journal of Nanoparticle Research/, Vol. 12, Issue 2, 551-562, 2010, DOI 10.1007/s11051-009-9673-3.
 32. Jaber-Ansari, L., Hahm,M., Kim,T., Somu,S., Busnaina, A. and Jung, Y. “Highly Organized Single-Walled Carbon Nanotube Networks for Electrical Devices” Appl. Phys. A 96 373 (2009) <http://link.springer.com/article/10.1007/s00339-009-5194-2>
 33. Jaber-Ansari, L., Hahm, M., Somu, S., Echegoyen, Y., Busnaina, A., Jung, Y. "Mechanism of Very Large Scale Assembly of SWNTs in Template Guided Fluidic Assembly Process", Journal of the American Chemical Society, 131, 804 (2009) [IF: 7.885] <http://pubs.acs.org/doi/abs/10.1021/ja8076523>
 34. Jaber-Ansari, L., Hahm, M., Somu, S., Busnaina, A. and Jung, Y. “Study of the Assembly Mechanism of Aligned Bundles of Single-Walled Carbon Nanotubes”, JACS 131, 804 (2009).
 35. Jaber-Ansari, L., Hahm, M., Somu, S., Busnaina, A. and Jung, Y. “Study of the Assembly Mechanism of Aligned Bundles of Single-Walled Carbon Nanotubes”, JACS 131, 804 (2009).

36. Kaur, I.; Jazdyk, M.; Stein, N. N.; Prusevich, P.; Miller, G. P., "Design, Synthesis, and Characterization of a Persistent Nonacene Derivative," *J. Amer. Chem. Soc.*, 2010, 132, 1261-1263 <http://pubs.acs.org/doi/abs/10.1021/ja9095472>
37. Kaur, I.; Stein, N.; Kopreski, R. P.; Miller, G. P., "Exploiting substituent effects for the synthesis of a photooxidatively resistant heptacene derivative," *J. Amer. Chem. Soc.*, 2009, 131, 3424–3425. DOI: 10.1021/ja808881x. (highlighted in SYNFACTS 2009, 6, 0616). <http://pubs.acs.org/doi/abs/10.1021/ja808881x>
38. Karimi,P., Kim,T., Aceros, J., Park, J. and Busnaina, A.A. "The removal of nanoparticles from sub-micron trenches using megasonics," *Microelectronic Engineering*, November 2009, doi:10.1016/j.mee.2009.11.052 <http://dl.acm.org/citation.cfm?id=1805569>
39. Kim, I, Cho, B, Park, J, Park, J and Park,H "Effect of pH in Ru Slurry with Sodium Periodate on Ru CMP", *Journal of The Electrochemical Society*, 156 (3) H188-H192 (2009) <http://jes.ecsdl.org/content/156/3/H188.full>
40. Kim, T., Wostyn,K., Mertens,P., Busnaina,A., Park,J. "Collapse behavior and forces of multistack nanolines", *Nanotechnology*, 21, 015708 (2010) <http://www.ncbi.nlm.nih.gov/pubmed/19946167>
41. Kim, T, Wostyn, K., Park, J, Mertens, P, "Pattern Collapse and Particle Removal Forces of Interest to Semiconductor Fabrication Process", *Solid State Phenomena Vols. 145-146 pp 47-50* (2009) <http://www.scientific.net/SSP.145-146.47>
42. Kim, Y., Li, B. , An, X., Hahm, M., Chen, L., Washington, M., Ajayan, P., Nayak,S., Busnaina, A., Kar,S., and Jung, Y. "Highly Aligned Scalable All-metallic Singlewalled Carbon Nanotubes Arrays for Electrical Nanoscale Interconnects", *ACS Nano*, 3, 2818 (2009) [IF: 5.472] <http://pubs.acs.org/doi/abs/10.1021/nn9007753>
43. Ku, B-C, Kim, D-K, Lee, J-S, Blumstein, A, Kumar, J, Samuelson, L.A., "Synthesis and Properties of Water Soluble Single-Walled Carbon Nanotube Graft Ionic Polyacetylene Nanocomposites", *Polymer Composites*, 30(12), 1817-1824 (2009) <http://onlinelibrary.wiley.com/doi/10.1002/pc.20754/abstract>
44. Kumar, A., Wei, M., Barry, C. and Mead, J., "Controlling fiber repulsion in multi – jet electrospinning for higher throughput," *Macromolecular Materials & Engineering*, Accepted (2010).
45. Liu, J.-F. and Miller, G. P., "Field–assisted nanopatterning of metals, metal oxides and metal salts," *Nanotechnology*, 2009, 20, 055303-1 – 055303-6 <http://www.ncbi.nlm.nih.gov/pubmed/19417344>
46. Liu, X., MacNaughton,S., Shrekenhamer, D., Tao,H., Selvarasah,S. Totachawattana,A., Averitt, R., Dokmeci,M., Sonkusale, S. and Padilla, W. "Metamaterials on parylene thin film substrates: Design, fabrication, and characterization at terahertz frequency," *Applied Physics Letters*, vol. 96, 011906, 2010 <http://scitation.aip.org/content/aip/journal/apl/96/1/10.1063/1.3275015>
47. Lu,W., Savo,S., Casse, B. and Sridhar, S. "Slow Microwave Waveguide Made of Negative Permeability Metamaterials" *Microwave and Optical Technology Letters*, V.51, No. 11, P.2705-09 (2009).
48. Luongo, L. and Zhang, X. (2010) Toxicity of carbon nanotubes to the activated sludge process. *Journal of Hazardous Materials*.

doi:10.1016/j.jhazmat.2010.01.087

<http://dx.doi.org/10.1016/j.jhazmat.2010.01.087>

49. Mackness, BC, Chourb, S, Farris,LR, McDonald, MJ. "Polymer-protein Enhanced Fluoroimmunoassay for Prostatespecific Antigen. *Anal Bioanal Chem.* 396: 681–686; 2010 <http://link.springer.com/article/10.1007%2Fs00216-009-3234-6>
50. Meng, G., Han, F., Zhao, X., Chen,B., Yang, D., Liu, J., Kong, M., Zhu,X., Xu,Q., Jung,Y., Yang,Y., Chu,Z., Ye, M., Kar,S., Vajitai,R. and Ajayan,P. "Connected Nanowire/Nanotube and Nanotube/Nanowire/Nanotube Heterojunctions with Branched Topology", *Angewandte Chemie*, 48, 1 (2009) [IF: 10.879] <http://onlinelibrary.wiley.com/doi/10.1002/ange.200901999/full>
51. Nenchev, G., Diaconescu, B., Hagelberg,F. and Pohl, K. "Self-assembly of methanethiol on the reconstructed Au(111) surface," *Physical Review B Rapid Communications* 80, 081401 (2009) <http://journals.aps.org/prb/abstract/10.1103/PhysRevB.80.081401>
52. Oh, J, Han,J, Lee,K, Hong, C, Han,W, Moon, J, Park, J, "Prevention of Condensation Defects on Contact Patterns by Improving Rinse Process", *Solid State Phenomena Vols. 145-146 pp 151-154* (2009) <http://www.scientific.net/SSP.145-146.151>
53. Park, J, Prasad,Y.N., Kang, Y., Kim,I., "Effect of Polysilicon Wettability on Polishing and Organic Defects during CMP", *Journal of The Electrochemical Society*, 156, 11 H869-H873(2009) <http://jes.ecsdl.org/content/156/11/H869.short>
54. Pfefferkorn F, Bello, D, Haddad, G., Park, J., Powell, M., McCarthy,J., Bunker, K., Fehrenbacher, A., Jeon, Y., Virji, M., Gruetzmacher, G., Hoover, MD: Characterization of exposures to airborne nanoscale particles during friction stir welding of aluminum. 2010 *Ann Occup Hyg*, Accepted <http://www.ncbi.nlm.nih.gov/pubmed/20453001>
55. Sandler, R. 2009. "Nanomedicine and Nanomedical Ethics," *American Journal of Bioethics*, 9, 10: 16-17. <http://www.tandfonline.com/doi/full/10.1080/15265160902995117>
56. Sandler, R. "In Pursuit of Nanoethics: Transatlantic Reflections on Nanotechnology" (Springer in press).
57. Sandler, R., "Nanomedicine, Ethical Issues," in Guston, D., ed., *Encyclopedia of Nanoscience and Society*, SAGE, in press
58. Sandler, R., "Nanoethics," in Guston, D., ed., *Encyclopedia of Nanoscience and Society*, SAGE, in press. <https://us.sagepub.com/en-us/nam/encyclopedia-of-nanoscience-and-society/book233289>
59. Sandler, R., "Genetically Modified Foods," in Guston, D., *Encyclopedia of Nanoscience and Society*, SAGE, in press.
60. Seo, J, Leow,P, Cho, S., Lim, H, Kim,J., Patel,B., Park, J. and O'Hare, D. "Development of inlaid electrode for whole column electrochemical detection in HPLC", *Lab on a Chip*, 2009 Aug 7;9(15):2238-44. (2009) <http://www.ncbi.nlm.nih.gov/pubmed/19606303>
61. Shang, Y, Kazmer, D, Wei, M, Barry, C., and Mead, J., Simulation of Self-Assembly of Ternary System on a Heterogeneously Functionalized Substrate, accepted for publication in *Polymer Engineering and Science*, to appear. <http://onlinelibrary.wiley.com/doi/10.1002/pen.21762/abstract>

62. Shen, J., Wei, M., Barry, C., and Mead, J., "Directed Assembly of Conducting Polymer on Nanotemplate by Electrical Fields" submitted to Langmuir.
63. Sok D, Clarizia, L., Farris LR, McDonald MJ. Novel Fluoroimmunoassay for Ovarian Cancer Biomarker CA-125. *Anal Bioanal Chem* 393:1521–1523; 2009
64. Tsai SJ, Huang RF, Ellenbecker MJ. 2009. Airborne nanoparticle exposures while using constant-flow, constant- velocity and air-curtain isolated fume hoods. *Ann Occ Hyg* <http://www.ncbi.nlm.nih.gov/pubmed/19933309>
65. Tsai SJ, Ada E, Isaacs J, Ellenbecker MJ. 2009. Airborne nanoparticle exposures associated with the manual handling of nanoalumina in fume hoods. *J Nanopart Res* 11(1):147-61 <http://link.springer.com/article/10.1007/s11051-008-9459-z>
66. Tsai SJ, Hofmann M, Hallock M, Ada E, Kong J, Ellenbecker, MJ. 2009. Characterization and evaluation of nanoparticle release during the synthesis of single-walled and multi-walled carbon nanotubes by chemical vapor deposition. *Env Sci Technol* 43(15):6017-23. <http://pubs.acs.org/doi/abs/10.1021/es900486y>
67. Tsai SJ, Hofmann M, Hallock MF, Ada E, Kong J, Ellenbecker, MJ. 2010. Control of nanoparticle exposure from synthesis of multi-walled carbon nanotubes: Evaluation of filtration system. *Env Sci Technol* in preparation.
68. Wang, M., LeMieux, M., Selvarasah, S., Dokmeci, M. and Bao, Z. "Dip-Pen Nanolithography of Electrical Contacts to Single-Walled Carbon Nanotubes," *ACS Nano*, vol.3, no.11, pp.3543-3551, 2009.
69. Wei, M., Fang, L., Lee, J., Somu, S., Xiong, X., Barry, C., Busnaina, A. and Mead, J. "Directed Assembly of Polymer Blends Using Nano-patterned Templates" *Adv. Mater.* 21 794 (2009). <http://onlinelibrary.wiley.com/doi/10.1002/adma.200802052/abstract>
70. Widom, A. Swain, J., Silverberg, J., Soma, S. and Srivastava, Y. "Theory of the Maxwell Pressure Tensor and the Tension in a Water Bridge" *Phys. Rev E* 80, 016301 (2009). <http://journals.aps.org/pre/abstract/10.1103/PhysRevE.80.016301>
71. Wostyn, K., Kim, T., Mertens, P., and Park, J, "Analyzing the collapse force of narrow lines measured by lateral force AFM using an analytical mechanical model", *Solid State Phenomena Vols.* 145-146 pp 55-58 (2009) <http://www.scientific.net/SSP.145-146.55>
72. Wu, Y-C, and Adams, G. "A Robust Analysis of the Actuation of a Carbon-Nanotube-Based Nanoswitch with Sidewall Slip," *Journal of Applied Physics*, Vol. 106, 2009, 054310. <http://scitation.aip.org/content/aip/journal/jap/106/5/10.1063/1.3211873>
73. Wu, Y.-C. and Adams, G. "Plastic Yield Conditions for Adhesive Contacts Between a Rigid Sphere and an Elastic HalfSpace," *Journal of Tribology*, Vol. 131, 2009, No. 1, 011403.
74. Xiong, X., Chen, C.-L., Ryan, P., Busnaina, A. A., Jung, Y. J. and Dokmeci, M. R., "Directed Assembly of Highdensity Single-Walled Carbon Nanotube Patterns on Flexible Polymer Substrates," *Nanotechnology*, 20, pp. 295302-308, July 2009. Downloaded 250 times as of August 11, 2009. Across all IOP journals, only 10% of articles were accessed over 250 times this quarter (July-Aug 2009). <http://www.iop.org/EJ/toc/0957-4484/20/29> This article was featured as news item in *Small* (news from the micro-nano world), Vol. 5, Issue 16, pp. 1814-15. <http://www3.interscience.wiley.com/cgi-bin/fulltext/122539216/PDFSTART>

75. Yoon, S. , Cha, N., Lee, J., Park, J., Carter, D., Mead, J., and Barry, C. “Effect of Processing Parameters, Antistiction Coatings, and Polymer Type when Injection Molding Microfeatures” *Polymer Engineering and Science*, 50(2), 411-419 (2010). <http://onlinelibrary.wiley.com/doi/10.1002/pen.21541/abstract>
76. Yoon, S., Lee, K., Palanisamy, P., Lee, J., Cha, N., Carter, D., Mead, J., and Barry, C. “Enhancement of Surface Replication by Micro-Gas-Injection Molding,” accepted for *Plastics, Rubber and Composites: Macromolecular Engineering* (2010).
77. Yoon, S., Padmanabha, P., Cha, N., Mead, J., and Barry, C. “Evaluation of Vacuum Venting for Micro-Injection Molding,” accepted for *International Polymer Processing* (2009). <http://www.hanser-elibrary.com/action/showMultipleAbstracts?mailPageTitle=Advanced+Search&href=%2Fauthor%2FYoon%252C%2BS-H&ContribStored=Yoon%2C+S-H&target=default&startPage=0&doi=10.3139%2F217.2308>
78. Zong, Z., Chen, C.-L., Dokmeci, M. and Wan, K. “Direct Measurement of Graphene Adhesion on Silicon Surface by Intercalation of Nano-Particles,” *Journal of Applied Physics*, vol. 107, 026104, 2010. <http://scitation.aip.org/content/aip/journal/jap/107/2/10.1063/1.3294960>