



National Nanomanufacturing Network

Newsletter

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The NNN Newsletter

Nanomaterials Regulations: Balancing Insight with Oversight



Emerging nanomaterials and nano-enabled consumer products are projected to have a significant, global impact on future economic, societal, and quality-of-life issues. The field of nanotechnology in general—and nanomanufacturing processes and nanomanufactured materials in particular—present a new regulatory paradigm for commercial sectors, academics, and government oversight and funding agencies alike. In essence, how do we responsibly maintain the critical balance between the necessity of regulatory oversight and the industry of scientific innovation?

The issues at hand are the extent to which governments ought to regulate manufacturers and suppliers that fall within new nanomaterials categories and the appropriate balance between industrial self-regulation and stringent government oversight. Exacerbating the decision making in this area are inferences of specific toxicity properties that have been reported based on less-than-comprehensive scientific studies, subsequent public dissemination of incomplete information by the media, and the rapid rate of change in science and technology which resists persistent modes of regulation.

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Regards,
Jeff Morse, Managing Director,
National Nanomanufacturing Network

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Report from National Science Foundation Workshop: Research Challenges for Integrated Systems Nanomanufacturing



The report from the NSF Workshop on Integrated Nanomanufacturing Systems is now available. The two-day workshop brought together approximately 25 leading

Upcoming Events

February 22 - 27, 2009

[SPIE Advanced Lithography](#)

February 25, 2009

[BioSIG Meeting](#)

February 28 - March 4, 2009

[Trends in Nanoscience](#)

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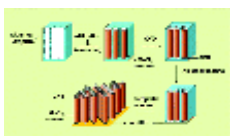
Center for Hierarchical Manufacturing
University of Massachusetts Amherst



experts to identify key issues for manufacturing of nanotechnology-enabled products and to begin the process of

categorizing specific concerns for individual product technologies and segments. The goal of this workshop was to elucidate the key research challenges facing Integrated Systems Nanomanufacturing, thereby providing a roadmap of the near term and long term focus areas that must be addressed. The workshop also addressed the theory of systems-level behavior of integrated nanosystems, including how nanoscale phenomena ultimately affect the characteristics and operability of macroscale systems. [More...](#)

Hybrid Coaxial Nanotubes for Lithium Batteries

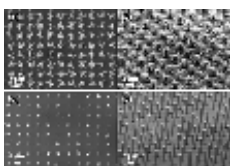


Reddy et. al. report in *Nano Letters* the synthesis and electrochemical testing of hybrid coaxial MnO₂/Carbon Nanotube array electrodes for lithium battery applications. Such a hybrid

nanostructure for Li-ion battery electrodes

benefits from the high electrical conductivity of the nanotube core, while exploiting the high Li storage capacity of the porous MnO₂ shell material. With the high aspect ratio of the hybrid nanotube configuration and the ultra-high surface area associated with the entire array, the potential exists to engineer the battery electrodes for long life while significantly enhancing the Li storage capacity. [More...](#)

Low Temperature Growth of Patterned ZnO Nanowire Arrays



One significant challenge in nanomanufacturing is the development of simple techniques to deposit or grow nanomaterials uniformly across large regions, while simultaneously controlling the spacing and arrangement of the individual

particles or structures. Recent efforts to grow nanomaterials directly onto substrates or devices has met with some success, though challenges still remain in devising synthetic routes that are compatible with the standard lithographic approaches used to form integrated circuits. A recent article from Z. L. Wang's group at Georgia Tech (Xu, et al., *JACS*, 2008, 130(45), 14958-14959) demonstrates a new technique to grow arrays of aligned ZnO nanowires onto a variety of inorganic substrates, without the use of metal catalysts or extreme synthesis conditions that could disrupt underlying device structures.

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[Chem Comm 2009\(7\):806-808](#)

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Implications in Nanoscale Fabrics
[IEEE Transactions on
Nanotechnology 8\(1\):22-30](#)

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[J Colloid Interface Sci 331\(1\):138-142](#)

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Virus Capsids
[Nano Letters 9\(1\):393-398](#)

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[J Mater Chem 19: 463-467](#)

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Fume Hoods

[J Nanoparticle Res 11\(1\): 147-161](#)

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