

UNIVERSITY OF CONNECTICUT



INSTITUTE OF MATERIALS SCIENCE

POLYMER PROGRAM SEMINAR

“Nanomanufacturing with Polymers”

Prof. Joey Mead

University of Massachusetts, Lowell

Friday, October 31, 2014

11:00 AM, IMS Room 20

The Nanomanufacturing Center at UMass Lowell has developed a suite of processes to enable the nanomanufacturing of polymer based products. Polymeric materials are attractive for many applications because of their ease of fabrication and wide range of properties (e.g. biocompatibility, polarity, and modulus). Polymer materials can be used as substrates or as functional materials (conducting or insulating). Nanofabrication processes include high rate, high volume mixing of nanoelements (CNTs, etc.) into polymers, extruded multilayer films, and electrospinning of nanofibers. Unique structures can be fabricated by template directed assembly processes followed by transfer to a polymer substrate. Assembly of a variety of nanoelements, such as nanoparticles, nanotubes, and polymers, using both electric fields and/or chemical functionalization has been demonstrated. The entire process of patterning and transfer to a polymer substrate can be accomplished in under five minutes, which is commercially relevant and can be utilized for real time processing, such as continuous or roll to roll processing. These nanomanufacturing processes can be used for a wide array of applications, including EMI shielding, flexible electronics, metamaterials, structural materials, and novel sensors. The environmental, health, and safety aspects of nanomanufacturing are also addressed.

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