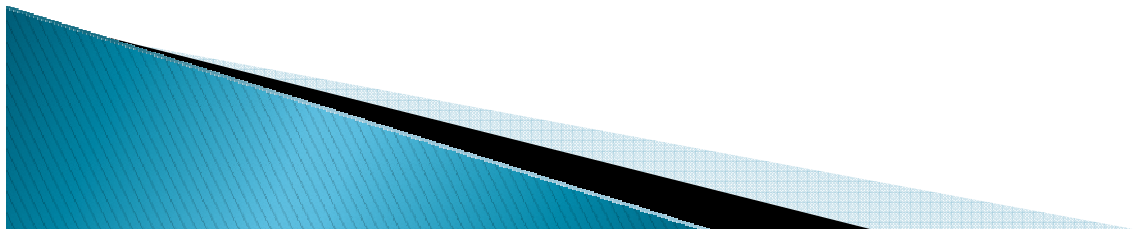


PROCESSING AND STABILISATION OF NANOPARTICLE SUSPENSIONS



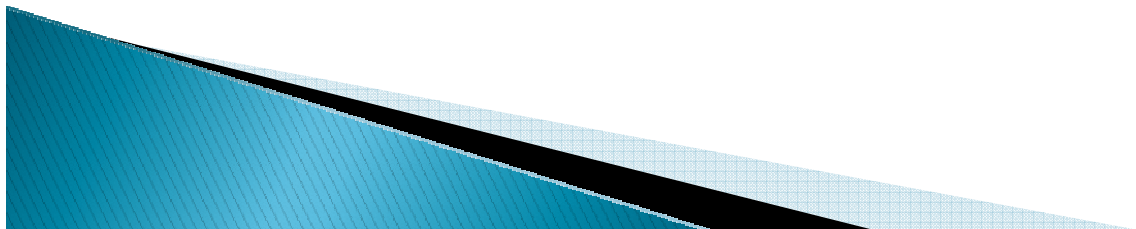
Manufacturing as a key challenge

- ▶ UMass Lowell along with Small Times magazine survey.
 - Of the 407 respondents, spanning many different industries, 39 percent said **high-volume manufacturing was the most important component of nanotechnology research** and development in the U.S. "Basic long-term research" was second at 15 percent.
- ▶ Rick Hess, president of Lowell-based Konarka Technologies, said
 - "Nailing that process down to produce a high-quality product is where the work is..."
- ▶ (Source: *Nanowerk*)
 - "... there is one area of nanotechnology that so far hasn't received the necessary attention: the **actual processes of manufacturing nanomaterials and the environmental footprint they create**, in absolute terms and in comparison with existing industrial manufacturing processes..."



Where is the science in this?

- ▶ Different features in “process science”
 - Understanding of parasitic processes not just main conversion
 - Whole process (not just the conversion)
 - Materials preparation, separation
 - Macroscopic properties (and their coupling with nanoproperties)
 - Scaleability of processing (coupling of phenomena)



And housekeeping

- Cleanout
- Safety, Health and Environment
- The referee is economics not an academic

