

Realizing the Promise of Nanotechnology

Both nanotechnology and green chemistry have promised to do more with less and have been driven by innovation. Proponents of both technologies promise to address the needs of a growing global population. Nanotechnology has promised advances in catalysis, energy production, and human health by harnessing the novel properties of materials that occur at the nanoscale. Green chemistry has promised to address many of the same challenges by minimizing the adverse health effects of chemicals while maximizing the efficiency of their production. This presentation will examine the ways that Nanotechnology can most rapidly provide greener/cleaner technologies.

The successful scaling of green nanotechnology will require advances in 4 areas: characterization, benchmarking, degradation, and toxicity. The adoption of any new technology requires product reliability and hence standardization of characterization which has often been the bottleneck in nanomaterial development. This characterization bottleneck will be addressed by innovation in reliable high throughput characterization techniques. In addition to improving materials reliability, nanoscientists need to look beyond single metric evaluations of new technologies (ie. better PV efficiency) and toward life cycle evaluations of new materials. In particular degradation and toxicity profiles of these materials should be determined through the materials synthesis, manufacture and disassembly process.

Meeting these challenges will help new nanotechnology based meet the increasingly stringent safety and information requirements being request from recent regulation in the EU and CA.