NANOHOUR

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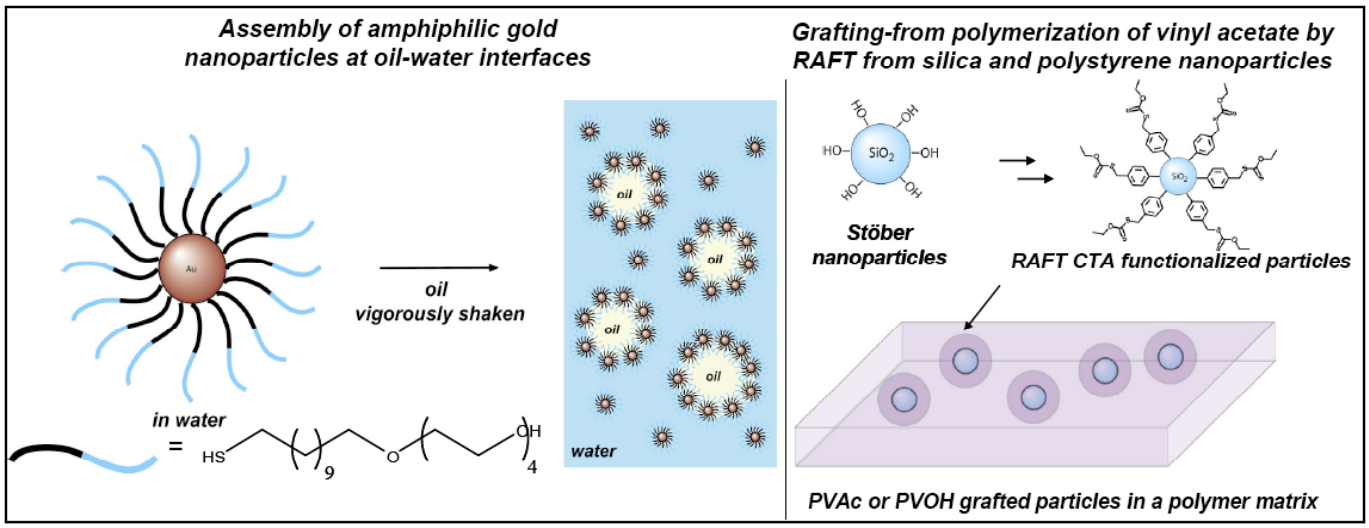
3:00 PM
Beckman Institute - Room 3269

Nanoparticle Functionalization and Grafting-from Chemistry for Controlling Surface Properties and Nanocomposite Behavior

Dr. Elizabeth Glogowski – Postdoctoral Student, Dept of Chemistry and Materials Science and Engineering



The surface functionalization of both gold and silica nanoparticles was controlled in order to direct their dispersion and assembly within various materials. Nanoparticles can be assembled at the oil-water interface to make stable droplets for delivery applications or as single electron transistors. Gold nanoparticles were functionalized with mixed ligands or amphiphilic ligands, and were found to assemble cleanly at the oil-water interface. Ligand composition, ligand cross-linking, and droplet size were varied to determine the effect on droplet stability. Gold nanoparticle-stabilized droplets were characterized by TEM, SFM, confocal microscopy, and pendant drop tensiometry. Ligand functionalized gold nanoparticles were also incorporated into polystyrene-*block*-poly(2-vinylpyridine) block copolymers. Tailoring of the ligand functionality allowed for direction of the nanoparticles within the microphase separated domains.

Silica and polystyrene particles were functionalized with a reversible addition fragmentation chain transfer (RAFT) agent to afford "grafting-from" polymerization of vinyl acetate from the particle surface. Poly(vinyl acetate) grafted particles were converted to poly(vinyl alcohol) (PVOH) grafted particles by base hydrolysis. The polymer grafted particles were characterized by TEM, DLS, and TGA. This is the first example of using grafting-from chemistry to achieve PVOH grafted nanoparticles.

Coffee and cookies will be served.
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