Impact Modifiers via Emulsion Polymerization

Morning Session

8:15 – 8:30 AM	Basics of emulsion polymerization (particle nucleation and growth, particle size control, reaction rates)
8:30 – 9:00 AM	Initiators and radical entry, copolymerization reactions, reactivity ratios, copolymer composition control
9:00 – 10:00 AM	Molecular weight control, chain transfer agents, cross-linking reactions, sol/gel, application to specific monomers (Bd, Sty, MMA, AN, BA)
10:00 – 10:15 AM	Coffee break
10:15 – 11:00 AM	Grafting reactions (competitive reactions forming grafted and ungrafted chains, grafting efficiencies, copolymer composition and molecular weight control), refractive index matching
11:00 – Noon	Particle morphology control during grafting, effects of surfactants, pH, monomer feed rates. Use of functional additives (e.g. vinyl acid monomers), colloidal stability

Afternoon Session

1:15 – 2:00 PM	Reduction of residual monomers (chemical/physical stripping) Coagulation, washing and drying of grafted latex Spray drying of grafted latex Effects of polymer Tg, surfactants, other additives (e.g. antioxidants, flow aids for extrusion and molding)
2:00 – 3:15 PM	Latex characterization (particle size, gel content, residual monomer,Tg's of the grafted particles – now a composite, grafting efficiency, particle morphology, MW of ungrafted polymer) Dry polymer (bulk density, powder flow) Final polymer blend (e.g. grafted polymer + matrix polymer [PVC]) morphology
3:15 – 3:30 PM	Coffee break

3:30 - 4:45 PM Structure/Property relationships

- Tensile properties (modulus, yield)
- Impact properties (Izod, energy to fail)
- Falling dart impact
- Gloss