

Abstract Submitted
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Vapor-Phase Free Radical Polymerization in the Presence of Ionic Liquids MALANCHA GUPTA — Ionic liquids (ILs) have recently attracted significant interest as an environmentally-friendly alternative to traditional volatile organic solvents because ILs are non-volatile, non-flammable, and can be easily recycled. ILs can be exploited in many ways to improve the selectivity and kinetics of chemical reactions, including polymer synthesis. Ionic liquids have negligible vapor pressure and are therefore stable under vacuum. A few studies have investigated ILs as substrates in inorganic vacuum deposition processes, but to our knowledge ILs have not been used in vapor phase polymerization systems. We have recently introduced ionic liquids into the initiated chemical vapor deposition (iCVD) process for the first time. The iCVD polymerization process occurs via a free-radical mechanism, and the deposited polymeric films are compositionally analogous to solution-phase polymers. Despite the wide range of polymers that have been synthesized using iCVD, it has proven difficult to polymerize monomers with low surface concentrations such as styrene and low propagation rates such as methyl methacrylate and it is difficult to produce block copolymers. In this talk, we will show that our novel ILiCVD system can address some of these shortcomings. We will explain the effects of deposition time, temperature, and monomer solubility on the morphology of the polymer and the molecular weight of the polymer chains.

Malancha Gupta

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