Department of Materials Science and Engineering,

PhD Defense

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Zoom link:
https://us02web.zoom.us/j/81234744079?pwd=ejNENHFzS3Nadm1taFlsM0cyRnhkZz09
Meeting ID: 812 3474 4079
Passcode: 614788

Post-Polymerization Modification of Block Copolymers for Functionalization-Induced Self-Assembly

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Abstract

This thesis is focused on expanding the utility of post-polymerization modification (PPM) and establishing it as a viable route for the synthesis of self-assembled polymeric nanoparticles through three primary research projects. The first project demonstrates Pd-catalyzed, Suzuki-Miyaura cross-coupling (SMC) as a new, versatile method for PPM on well-defined polymers derived from RAFT polymerization. The second project aims to employ SMC as the driving force behind a novel strategy for inducing dynamic self-assembly of block copolymers into nanoparticles through a technique termed "functionalization induced self-assembly" (FISA). The final project of this thesis improves upon the versatility and ease-of-use of FISA by extending it to the base-catalyzed thiol-epoxide "click" reaction as the primary PPM driving in situ self-assembly, thus achieving convenient polymer nanoparticle synthesis under ambient conditions and atmosphere.