Abstract Submitted
for the TSF10 Meeting of
The American Physical Society

NanoSphere Lithography-Based Micro/Nano-patterning techniques of polymer brushes. FERNANDO MONJARAZ, DIPIKA PATEL, SOYEUN PARK[1], Department of Physics Texas Tech University — The fabrication of micro/nano-patterned polymer brushes has been a challenge due to unique interfacial properties originated from the strong confinement and the dominant edge effects. We have developed unique bottom-up fabrication to synthesize polymer brushes grafted on the nanoparticle arrays created by NanoSphere Lithography (NSL). We used spin-coating and capillary action deposition to create the nano-particle arrays. Through UV-driven living radical polymerization, based on iniferters selectively coupled on nanoislands, the poly-DMA chains were grown from nano-particle arrays. The superimposed patterns were transferred using conventional photo-lithography. AFM topographic images showed the swelling behavior of polymer chains in good solvents, confirming the selective growth of polymers on nanoislands. We also found that the mechanical and kinetic properties of polymer brushes grafted on nanoislands are strongly governed by dominant edge effects by analyzing the AFM force spectroscopy.

[1]Corresponding Author

Fernando Monjaraz
Department of Physics Texas Tech University

Date submitted: 27 Sep 2010 Electronic form version 1.4