Abstract Submitted
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Formation and Characterization of Stacked Nanoscale Layers of Polymers and Silanes on Silicon Surfaces[1] ROSIE OCHOA, BRIAN DAVIS, HIRAM CONLEY, KATIE HURD, MATTHEW R. LINFORD, ROBERT C. DAVIS, Brigham Young University — Chemical surface patterning at the nanoscale is a critical component of chemically directed assembly of nanoscale devices or sensitive biological molecules onto surfaces. Complete and consistent formation of nanoscale layers of silanes and polymers is a necessary first step for chemical patterning. We explored methods of silanizing silicon substrates for the purpose of functionalizing the surfaces. The chemical functionalization, stability, flatness, and repeatability of the process was characterized by use of ellipsometry, water contact angle, and Atomic Force Microscopy (AFM). We found that forming the highest quality functionalized surfaces was accomplished through use of chemical vapor deposition (CVD). Specifically, surfaces were plasma cleaned and hydrolyzed before the silane was applied. A polymer layer less then 2 nm in thickness was electrostatically bound to the silane layer. The chemical functionalization, stability, flatness, and repeatability of the process was also characterized for the polymer layer using ellipsometry, water contact angle, and AFM.

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