CONTRALLABLE LINEAR NANOWIRE FRABRACTION BY DIBLOCK COPOLYMER POLYSTYRENE-B-POLY(2-VINYPYRIDINE). *C.K. Chen, Material Science and Engineering ProgramY.W. Lu, Microsystems Engineering*
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Organizing metallic particles at nanoscale, or nano-objects in general, to form stochastic or ordered patterns on surfaces has presented a challenging task with great potential. Semiconductor industry, for instance, has been seeking for a new paradigm to effectively create and arrange smaller features, which can break through the size barrier in today's electronic fabrication. The objective of this project therefore is to explore this new paradigm by using diblock copolymers, self assembling diblock copolymer, as a template to form metallic structure, repeated linear patterns at nanoscale . Our approach to organize nano-particles relies on the demixing behavior of immiscible polymer blends from diblock copolymer ─ Polystyrene-block-poly(2-vinylpyridine) (PS-b-P2VP). Based on the chemical and physical properties of copolymers, the temperature and concentration of polymer solutions are two major concerns: the former affects the solubility and uniformity of the solution, or nano-patterns, while the latter determines the micelle size, or the width of nano-patterns. The randomly nano-pattern (finger print pattern) with 40nm-wide lines has been demonstrated in this research work. Our next task will be to utilize the diblock polymer and to decorate it with gold nano-particles to form metal wires.