



Dopant induced solubility control patterning of polymer semiconductors

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■ It is known that the solubility of semiconducting polymers can be “switched off” using addition of high electron affinity molecular dopants. Here we demonstrate both chemical and optical mechanisms by which the doping can be reversed and the solubility of the polymer is “switched back on.” Using these techniques, we are able to **vertically stack** and **laterally pattern** mutually soluble polymer layers, which are vital processing steps needed to expand the use of organic semiconductors. Optimization of these techniques has yielded diffraction limited film patterning with regular features of 200-300 nm. Comparison of patterned and initial samples shows no change in the optical, electrical or chemical properties of the polymer. Dopant induced solubility control (DISC) patterning offers a new avenue to process semiconducting polymers with applications in all areas of organic electronics.