

Photolithographic Patterning for Organic Electronics

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A critical step for the realization of organic electronics is the availability of patterning techniques that are compatible with these materials. Although great strides have been achieved in our ability to pattern organics, the techniques used in the mature and entrenched industry of silicon processing have made little impact in this field. This is primarily due to incompatibilities between chemicals used in photolithography and the vast majority of organics. Overcoming these incompatibilities promises a breakthrough in the manufacturing of organic electronics since it would provide for massively parallel output along with process knowledge and equipment already available from a very successful industry. We report on a few generic approaches for the photolithographic patterning of organic materials using sacrificial layers as well as photoresists that can be processed with solvents that are orthogonal to organics^{1,2,3,4,5}. We demonstrate the applicability of these approaches to the additive and subtractive patterning of several organic semiconductors, including polymers and small molecules. The application of photolithography to pattern various organic devices with micron-scale features is demonstrated.

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