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Nanostructured Ultrathin Carbazole Polymer Layers for Improved Hole-Transport and Injection Properties on ITO

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This talk will focus on strategies to modify Indium Tin Oxide (ITO) surfaces, an important substrate for display and photovoltaic devices using macromolecular grafting, layer-by-layer, and electrodeposition methods of carbazole derivatives. An important consequence is the improved morphology of rough ITO surfaces and better interfacial adhesion. This involves the use of surface initiated polymerization (SIP) to directly modify and graft carbazole containing layers. Alternatively, layer-by-layer deposition of hole-transport and injecting layers allow for controlled layer thickness and layer ordering. Lastly, the use of electropolymerizable conjugated polymer network precursors allow for a highly cross-linked films with improved stability and charge carrier transport. The use of surface sensitive analytical methods is key to defining structure-property relationships. Several device configurations and performance will be described.