

## Surface Modification of ZnO for Fabrication of Inverted Hybrid Solar Cells with Improved Power Conversion Efficiency

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A prototypical system involving poly(3-hexylthiophene) (P3HT) on planar zinc oxide (ZnO) films that have been modified via deep and spin coating and with 6 different types of molecules: 1-Pyrenecarboxylic acid (PCA), 1-Pyrenesulfonic acid sodium salt (PSA), 3-Thiophenecarboxylic acid (TCA), 5-Hexyl-2-thiophenecarboxylic acid (HTCA), Sunset Yellow FCF (SY) and Fast Green FCF (FG) were examined. The functionalized surfaces were characterized using water contact angle measurements and atomic force microscopy. For all of the modifiers, the short circuit current (JSC), open circuit voltage (VOC), and power conversion efficiency (PCE) were higher for spin coated samples. Between all devices, samples modified with FG via spin coating showed highest PCEs, 0.4018% which it was more than 6 times higher than un-modified device.