

Relation between morphology and work function of metals deposited on organic substrates

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Abstract

Ultraviolet photoemission spectroscopy (UPS) is employed to determine the work function of silver and indium films grown on two perylene derivatives, dimethylen-3, 4, 9, 10-perylenetetracarboxyylimide (DiMe-PTCDI) and 3, 4, 9, 10-perylenetetracarboxylic dianhydride (PTCDA). The PTCDA and DiMe-PTCDI substrates were prepared as thick organic layers on sulphur passivated GaAs(0 0 1), where the molecular planes of PTCDA and DiMe-PTCDI are parallel and tilted with respect to the substrate surface, respectively. The crystalline structure of the evaporated metal layers is investigated using X-ray diffraction (XRD) and is found to be strongly dependent on the underlying organic substrate. Correspondingly, work functions are found to be different by more than 200 meV in agreement with the crystalline orientation of the metal films.

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