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Effect of Gold Roughness on Growth of Copper Phthalocyanine¹

KEVIN CANO, California State University - Long Beach, JOSHUA CORONA, CARLOS GARCIA, THOMAS GREDIG, California State University, Long Beach — Metallo-phthalocyanine-based thin films have found diverse applications, in field-effect transistors, gas sensors, and photovoltaic devices. The device performance and electrical properties depend on the orientation of the planar molecule with respect to the substrate. It had been previously found that the molecular plane adheres parallel to a metallic surface, whereas the metal-centers attach to themselves on insulating substrates forming a standing configuration. Here, the effect of gold roughness is examined using atomic force microscopy (AFM) and x-ray diffraction (XRD). Samples were co-deposited at room temperature with 20 nm of CuPc ensuring equal conditions. The Au roughness was varied by depositing it either onto Cr or Si and by modifying the Au thickness from 12 nm to 50 nm. The change in thickness for the Au/Si substrates affected a change in the roughness of the CuPc, which changed from 5.8 nm to 2.3 nm. Crystallo-graphic peaks from the x-ray diffraction showed a crystalline peak of 13.0 Å at 6.8° for all samples. The surface morphology and grain size, however, was unaffected.

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