Abstract Submitted
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The Observation of an Unoccupied Shockley-Type Surface State at the H_2-phthalocyanine/Ag(111) Interface[1] BENJAMIN CAPLINS, DAVID SUICH, ALEX SHEARER, CHARLES HARRIS, University of California, Berkeley – Dept of Chemistry — A free-electron interface state has been observed at the H_2-Phthalocyanine/Ag(111) interface using time- and angle-resolved two-photon photoemission. Energetically the interface state is located $\sim$0.21 eV above the Fermi level and angle-resolved measurements yield an effective mass of 0.5 m_e. These measurements, in conjunction with density functional theory calculations allow us to assign the interface state as being a metal/molecule hybrid state derived from the Shockley state of the clean Ag(111) surface. Time-resolved measurements of two different crystalline phases of H_2-Phthalocyanine monolayers reveal that the lifetime of the interface state is sensitive to the bonding geometry of the molecule. The results of this study add to a mounting body of evidence that suggests that the Shockley surface state is robust and persists after deposition of organic π-conjugated materials in the form of an uplifted interface state, instead of being 'quenched'.

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