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**Influence of interfacial structure on the charge transfer between adsorbed $C_{60}$ and Cu(111)** WOEI WU PAI, J.H. LIN, Center for Condensed Matter Sciences, National Taiwan University, Taipei 106, Taiwan R.O.C., A.D. ZHAO, X.Q. ZHANG, X.D. XIAO, Department of Physics, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong — $C_{60}$ adsorption on metal surfaces typically incurs different amount of charge transfer from the substrate to the molecules. The charge transfer amount has never been found to approach that of optimally doped fulleride, e.g., $K_3C_{60}$, in which three electrons occupy the $C_{60}$ LUMO states. Here we demonstrate that $C_{60}$ adsorbed on Cu(111) render a nearly optimally doped fullerene film. The critical factor to produce such strong charge transfer is the identification of interfacial reconstruction in which a $C_{60}$ most probably resides in a monolayer pit consisting of seven removed Cu atoms. A direct comparison of low temperature (77 K, 4 K) STS on $C_{60}$ regions with and without interfacial reconstruction reveals drastic differences in charge transfer amount. Our STM/STS results are also consistent with a recent photoemission study [1] showing the optimal doping characteristic of the same system. This study thus demonstrates the importance of interfacial structure, which is often based on assumption, on prominent properties of molecular thin films.
[1] C. M. Cheng, K. D. Tsuei, unpublished.

Woei Wu Pai
Center for condensed matter sciences, National Taiwan University, Taipei 106, Taiwan R.O.C.

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