

Abstract Submitted
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Fermi surfaces of pure and K-doped C_{60} monolayer on Cu(111) surfaces studied by high resolution angle-resolved photoemission spectroscopy K.-D. TSUEI, National Synchrotron Radiation Research Center, and Department of Physics, National Tsing Hua University, Hsinchu, Taiwan, R.O.C., C.-M. CHENG, National Synchrotron Radiation Research Center, C.-C. WANG, Department of Physics, National Tsing Hua University, J.-Y. YUH, National Synchrotron Radiation Research Center — The electronic structure of C_{60} on Cu(111) surfaces has been studied by high-resolution photoemission. The LEED pattern for one monolayer C_{60} on a Cu(111) surface shows a sharp (4x4) pattern. In photoemission the LUMO-derived band is partially filled by charge transfer from Cu surface and the spectrum is similar to that of gas phase C_{60}^- . The satellite peaks of LUMO indicate strong electron-phonon coupling. Comparing to spectra of K doped films the undoped 1 ML film was found to have nearly half-filled LUMO or “ K_3C_{60} ,” in contrast to 0.8e found in a recent calculation. [1] The Fermi surface was mapped by angle-resolved photoemission. It shows a clear electron-like pocket near the zone center, unlike the hole-like Fermi surface in “ K_3C_{60} ” on Ag(111), [2] due to different C_{60} orientation. In the case of Cu the Fermi surface near the zone center accounts for only 0.1 electrons. Near the K-point at least one hole-like Fermi surface can be observed. The detailed Fermi surface will be discussed. [1] L.-L. Wang and H.-P. Cheng, Phys. Rev. B 69, 045404 (2004). [2] W. L. Yang et al., Science 300, 303 (2003).

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