

[N-11]

Study of pentacene molecules on Au(100) surface with low temperature scanning tunneling microscope

Young-Jae Song, Kyuho Lee*, Jaejun Yu* and Young Kuk
Center for Science in Nanometer Scale, Seoul National University,
*School of Physics, Seoul National University

We resolved the HOMO and LUMO states of pentacene molecules on a metal surface at 80K with home built low temperature scanning tunneling microscope. The observed image agrees well with the density functional theory calculation. The pentacene molecules were thermally evaporated to atomically clean Au(100) surface at room temperature, and the coverage was controlled by the evaporation time. Unidirectionally ordered growth-pattern of pentacene molecules on the Au(100) surface is visible at the coverages of submonolayer and several monolayers. At submonolayer coverage, thermally evaporated pentacene molecules are restricted to the corrugation of the reconstructed surface with lateral correlation along the axis perpendicular to the reconstructed rows of Au(100). At higher coverage, pentacene-pentacene interaction plays a roll to the growth-pattern. Calculated molecule-molecule interaction along and perpendicular to the long axis shows good agreement.

