SW-P007

# Self-Assembly of Pentacene Molecules on Epitaxial Graphene

**Woosung Jung, Junhae Lee, Sung Joon Ahn, Chong-Yun Park**

BK21 Physics Research Division and Department of Energy Science, Sungkyunkwan University

Graphene have showed promising performance as electrodes of organic devices such as organic transistors, light-emitting diodes, and photovoltaic solar cells. In particular, among various organic materials of graphene-based organic devices, pentacene has been regarded as one of the promising organic material because of its high mobility, chemical stability. In the bottom-contact device configuration generally used as graphene based pentacene devices, the morphology of the organic semiconductors at the interface between a channel and electrode is crucial to efficient charge transport from the electrode to the channel. For the high quality morphology, understanding of initial stages of pentacene growth is essential.

In this study, we investigate self-assembly of pentacene molecules on graphene formed on a 6H-SiC (0001) substrate by scanning tunneling microscopy. At sub-monolayer coverage, adsorption of pentacene molecules on epitaxial graphene is affected by 6×6 pattern originates from the underlying buffer layer. And the orientation of pentacene in the ordered structure is aligned with the zigzag direction of the edge structure of single layer graphene. As coverage increased, intermolecular interactions become stronger than molecule-substrate interaction. As a result, herringbone structures the consequence of higher intermolecular interaction are observed.

**Keywords:** graphene, pentacene, STM,