

Geometrical and Electronic Structure of Epitaxial Graphene on SiC(0001) : A Scanning Tunneling Microscopy Study

Jeonghoon Ha, Heejun Yang, Hongwoo Baek, Jungseok Chae, Beomyong Hwang and Y. Kuk

Department of Physics and Astronomy, Seoul National University, Korea

Monolayers of graphite can be grown by fine controlled surface graphitization on the surfaces of various metallic and semiconducting materials. Epitaxial graphene grown on polished silicon carbide crystal surfaces has drawn much attention due to well known vacuum annealing procedures from surface analysis methods, especially scanning tunneling microscopy (STM) and scanning tunneling spectroscopy (STS).

In this study, we have grown single layer and few layer graphene on silicon terminated 6H-SiC(0001) crystals. The growth of graphene layers were observed by low energy electron diffraction (LEED) patterns. Scanning tunneling microscopy and spectroscopy measurements were performed to illustrate the electronic structure which may display some clue on the influence of the underlying structure. Spatially resolved STS results acquired at the edges of epitaxial graphene show in detail the electron density of states, which is compared to theoretical calculations. STM measurements were also done on graphene films grown by chemical vapor deposition (CVD) and transferred onto a SiC(0001) crystal. These observations may provide a hint for the understanding of carrier scattering at the edges.