SCANNING PHOTOELECTRON MICROSCOPY FOR NANOMATERIALS AND NANODEVICE CHARACTERIZATION

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A scanning photoelectron microscope (SPEM) was installed at the 8A1 undulator beamline at the Pohang Light Source in Korea. The best space resolution of the SPEM in practical application is yet about 0.5 micrometer, which is much larger than the need of nanotechnology community. Nevertheless, the SPEM has been applied to nanomaterials and nanodevices in order to provide the chemical state information on domains of specific interest, such as graphene layers of several micrometers wide (single-, double-, and multi-layered graphenes) [1] and intentionally fabricated nanodevice patterns having micrometer size electrodes and bunch of Li-atom-intercalated Pyrene-functionalized carbon nanotubes dispersed between the electrodes [2]. In the former application, SPEM was applied to provide photoelectron spectral shape or chemical shift as a fingerprint of graphene thickness. In the latter application, SPEM was applied to identify the location of Li atoms along the conduction path that could explain the origin of diode characteristics. In this presentation, we will also introduce the limitation and the applicability of the SPEM for investigating the nanometerials and the nanodevices.

References:

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