



IBS Center for Multidimensional Carbon Materials



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Soft-X-Ray Spectromicroscopy at the Pohang Light Source

Tuesday, JUNE 7 | Bldg. 101
4 PM | Seminar room on the 1st floor

Soft x-rays from an insertion device of the 3rd generation light source have become brilliant enough to provide practically detectable signals from a specimen for each different kind of spectroscopic technique, such as, absorption spectroscopy, photoelectron spectroscopy, and fluorescence spectroscopy, even if the lateral size of soft x-rays is focused down to tens of nanometers at the position of specimen by using a soft x-ray lens, Fresnel zone plate. This brought us a new field of combining spectroscopy and microscopy, spectromicroscopy (or spectro-nanoscopy or spectro-nanoprobe), which is becoming more popular in practical application of materials analysis.

After a brief introduction to Pohang Light Sources (PLSs) (3rd generation synchrotron light source and 4th generation x-ray free-electron laser) and some of x-ray-based material-analysis techniques [such as, x-ray diffraction (XRD), x-ray fluorescence spectroscopy (XRF), x-ray photoelectron spectroscopy (XPS), x-ray absorption spectroscopy (XAS)], two kinds of soft x-ray based spectromicroscopy, scanning photoelectron microscopy (SPEM) and scanning transmission x-ray microscopy (STXM), at the PLS will be introduced.

SPEM is a micro-XPS. It analyzes photoelectrons generated from the surface of the specimen and provides detailed chemical state information on the sample surface. SPEM is a very surface sensitive probe, less than a few nm in probing depth, and has been actively applied for the investigation of 2-D materials. STXM is a nano-XAS. It measures soft x-ray intensity changes transmitted through a specimen and provides elemental and chemical state information from a local position of a specimen, typically with ~30 nm space resolution. Details on characteristic features and application activities of each spectromicroscope will be presented and finally recent trend of functionality improvement, e.g. space resolution improvement to ~ 5 nm by applying Ptychography technique in STXM will be introduced.

You are cordially invited to attend!

Tuesday Colloquium