Soft x-ray nanoscopes at the PLS: application activities and status

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In this presentation, current status of Pohang Light Source's soft-x-ray-based three nanoscopes and their activities will be introduced.

(1) Scanning photoelectron microscope (SPEM) has been operational for the past ~10 years and has been utilized in order to investigate local chemical states and electronic structures on the surface and interfaces. The space resolution is 500 ~ 1000 nm and usable photon energy range is about 400 ~ 1100 eV. The schematic and basic specifications of the SPEM and its application examples, such as investigation of phase separated diluted magnetic semiconductors and functionally modified graphene surfaces, will be provided.

(2) A compact transmission x-ray microscope (TXM) has been developed. This TXM has no dedicated beamline but is easily mountable to any beamline and is efficient in alignment. Sample is placed in air. The space resolution is around 30 nm at the photon energy of 500 eV and data acquisition time is typically 1 ~ 10 sec with a bending magnet beamline radiation. With this TXM, nano-particles and bio samples in solution are intensively being investigated.

(3) A scanning transmission x-ray microscope (STXM) is under construction at an elliptically polarized undulator beamline. The STXM is expected to be commissioned from this autumn. The expected space resolution is in the range of 20 ~ 50 nm at the photon energy range of 250 eV ~ 1500 eV, with spectral resolving power ($E/\Delta E$) of 3000 ~ 5000.