**Introduction of in-situ Deposition and Surface Analysis system for low-D nanomaterials in KBSI**

**Cheolho Jeon**

*Advanced Nano-Surface Group*, *Korea Basic Research Institute*, *Korea*

[cjeon@kbsi.re.kr](mailto:cjeon@kbsi.re.kr)

The in-situ deposition and surface analysis system has been developed in Korea Basic Science Institute (KBSI) for 8 years to investigate genuine properties of low-D nanomaterials. A sample can be prepared in 6 different deposition systems and analyzed using 8 unique analysis systems, which are all connected each other through UHV sample transfer system. So, exposures of sample to air in between preparation and analysis is not necessary, which allows us to study genuine properties and growth mechanism of low-D nanomaterials without any contamination. The 6 deposition systems are chemical vapor deposition (CVD), DC/RF sputter, plasma-enhanced atomic layer deposition (PEALD), thermal evaporator, high-vacuum CVD, pulsed laser deposition (PLD). The unique 8 analysis systems have been chosen to cover various properties of material. Two microscopy, low energy electron microscopy (LEEM) and scanning probe microscopy (SPM) were installed to observe shape and structure of nanomaterials in large and atomic scale, respectively.

X-ray/UV photoelectron spectroscopy (XPS/UPS) equipped with Ar+ cluster ion gun and angle-resolved photoelectron spectroscopy (ARPES) are used to measure chemical composition and electronic structure in plane and depth. Operando experiment is also performed using gas cell type near-ambient pressure XPS. Raman spectroscopy, FT-IR spectroscopy,and four-point probe station connecting to the UHV sample transfer system will be installed in moderate vacuum conditions. This system is open to users who want to know genuine properties and growth mechanism of wonderful materials.