

## Surface/Interface Compositional and Structural Analysis by Medium Energy Ion Scattering Spectroscopy(MEIS)

Dae Won Moon

Korea Research Institute of Standards and Science

### ABSTRACT

Recently Medium Energy Ion Scattering Spectroscopy(MEIS) has been developed, which can profile the surface composition and structure with atomic layer depth resolution quantitatively and non-destructively.

In this presentation, the basic principle of the MEIS and the MEIS system constructed at Korea Research Institute of Standards and Science (KRISS) will be described briefly. Among some of the preliminary results, will be shown MEIS analysis results on the altered surface layers of amorphous  $Ta_2O_5$ , Si(100), and GaAs(100) thin film surfaces due to Ar<sup>+</sup> ion bombardment as a function of the ion incidence angle and the ion dose. This study would be interesting to the TEM community regarding to the ion milling process for the final thinning of TEM specimens. In addition to these ion beam bombarded surfaces, 30nm and 10nm  $Ta_2O_5$  on Si, a multilayered thin film of (10nm- $Ta_2O_5$ /10nm-SiO<sub>2</sub>)<sub>4</sub> on Si, and Ta ion implanted Si were analyzed to survey the capability of MEIS analysis for ultra-thin films with H<sup>+</sup>, N<sup>+</sup> and Ne<sup>+</sup> ions. These results showed that MEIS can be one of the ultimate surface and interface analysis tools for ultra-thin films with the atomic layer resolution, if a couple of progresses can be made.