

[V-5]

## Morphology and Surface Magnetism of Ultrathin Fe Films on Pd(111)

Jae Hoon Choi, Wookje Kim, Wondong Kim, Jae-Young Kim, Hoon Koh, S.-J. Oh  
*Department of Physics and Center for Strongly Correlated Materials Research,  
Seoul National University, Seoul 151-742, Korea*

*In situ* surface magneto-optic Kerr effect(SMOKE), X-ray photoelectron spectroscopy(XPS) and low energy electron diffraction(LEED) were used to study magnetic and structural properties of ultrathin Fe films grown on the Pd(111) surface. The SMOKE measurement showed strong enhancement of ferromagnetism after proper annealing process. Simultaneous changes in morphology was checked by LEED and XPS. After room temperature Fe deposition, longitudinal magnetization appeared above a critical thickness between 2.0 and 2.5 monolayers. When annealed at 450K, 2.0 monolayer Fe film exhibited both longitudinal and polar magnetizations while 3.0 and 5.5 monolayer films showed little changes. After annealing at 600K, both magnetizations were totally destroyed in 2.0 monolayer film, but longitudinal magnetization was enhanced in 3.0 monolayer film. In the case of 5.5 monolayer film, it was only after 660K annealing that the enhancement of the longitudinal magnetization was observed. It was concluded that the surface flatness and the amount of intermixing were critical in the development of surface magnetism of this system.