Quantitative Surface Analysis of Au-Pd and
Cu-Pd alloys by AES, XPS and ISS

Hee-Jae Kang   and   Chang Han Kim

Chungbuk Nat'l Univ., Department of Physics, Cheongju, Chungbuk, 360-763

ABSTRACT - The surface composition of Au-Pd and Cu-Pd alloys has been studied using AES, XPS and ISS to ascertain the equilibrium concentration of constituents. In AES and XPS quntitative analysis, the matrix factors such as backscattering factor (only in AES) and inelastic mean free path(IMFP, both AES and XPS) were considered. In ISS quantification, the sensitivity factor has been obtained from pure standards. AES and XPS results show the Pd rich in surface. But ISS results show the Au (in Au-Pd alloys) and Cu (in Cu-Pd alloys) rich in outermost layer for each alloys. The difference between AES/XPS and ISS quantification can be understood as the compositional gradients in the surface layer and the respective depth resolution of these analysis techniques. Ion bombardment induced compositional gradients in the surface layer can be expalined in terms of preferntial sputtering, radiation induced suface segregation and radiation enhanced diffusion.