# Applications

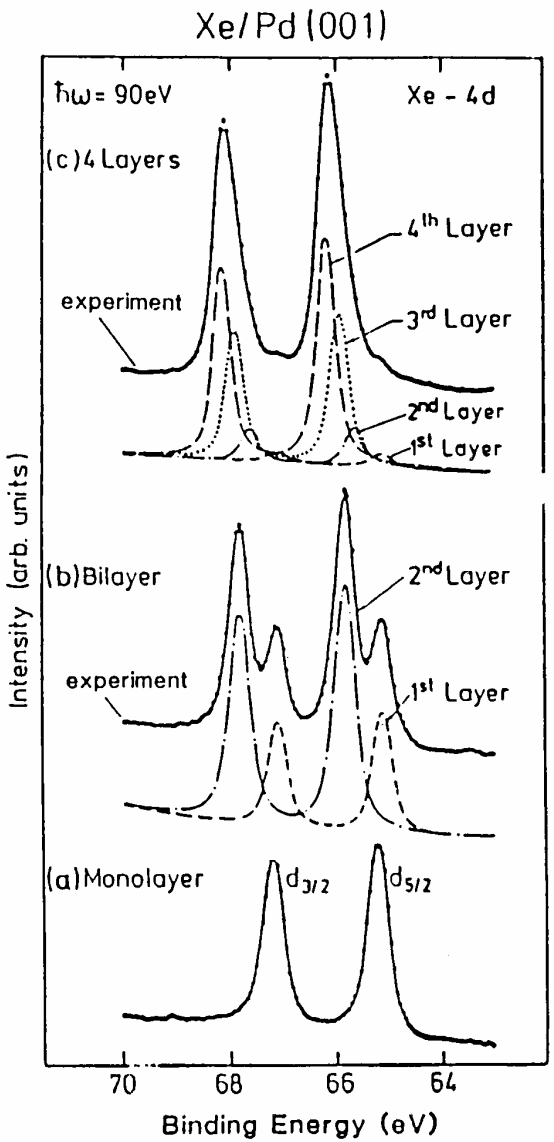


Fig.2.34. Xe 4d core-level PE spectra for (a) a monolayer, (b) a bilayer and (c) four layers of Xe on Pd(001). The binding energies are with respect to the vacuum level of the adsorbate covered substrate. The solid curves are the result of a least-squares fit of the experimental data (full dots) to (a) one spectrum, (b) two spectra (1st and 2nd layer) and (c) 4 spectra (1st to 4th layer) [2.76]

Photoelectron spectroscopy is surface sensitive, to the extent that it can distinguish monolayers. It is also possible to distinguish one layer from the next layer, etc.

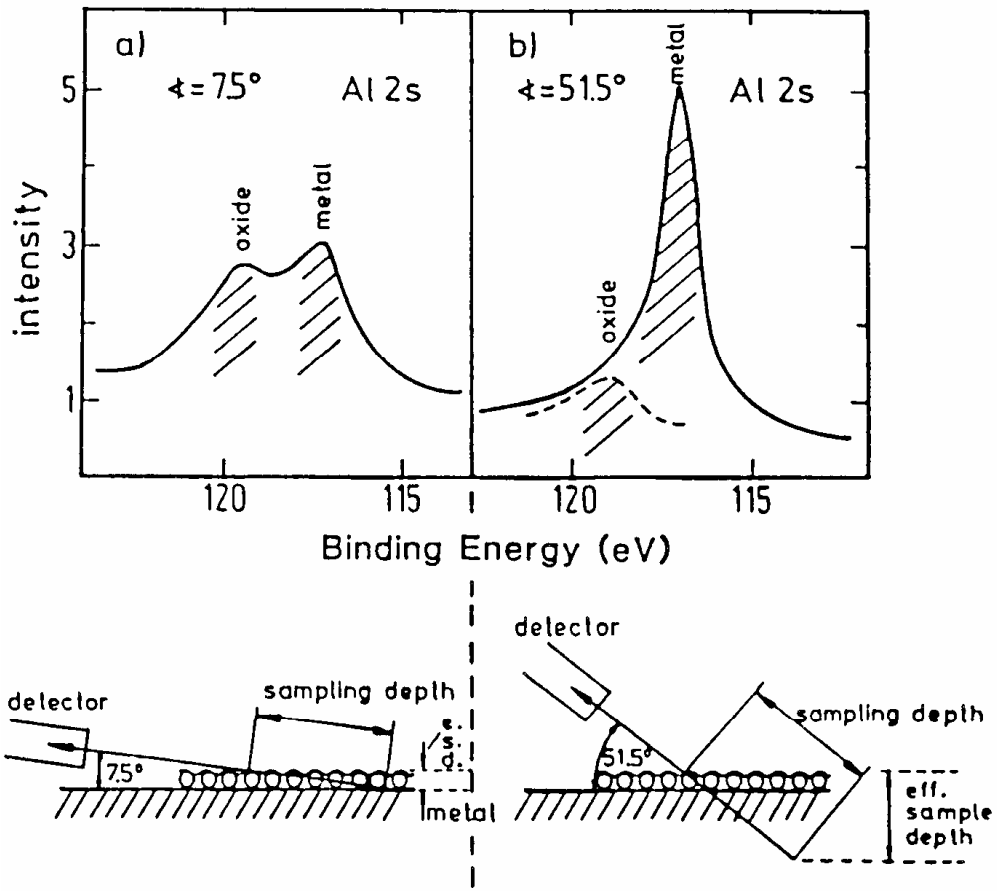


Fig.2.32. Surface sensitivity of XPS, demonstrated by changing the electron detection angle relative to the surface for a slightly oxidized surface of Al. At 7.5°, the Al 2s signals from Al metal and oxidized Al have the same magnitude, while at 51.5° the oxide signal is hardly visible [2.74]

Surface sensitivity enhancement is possible by tilting the sample.

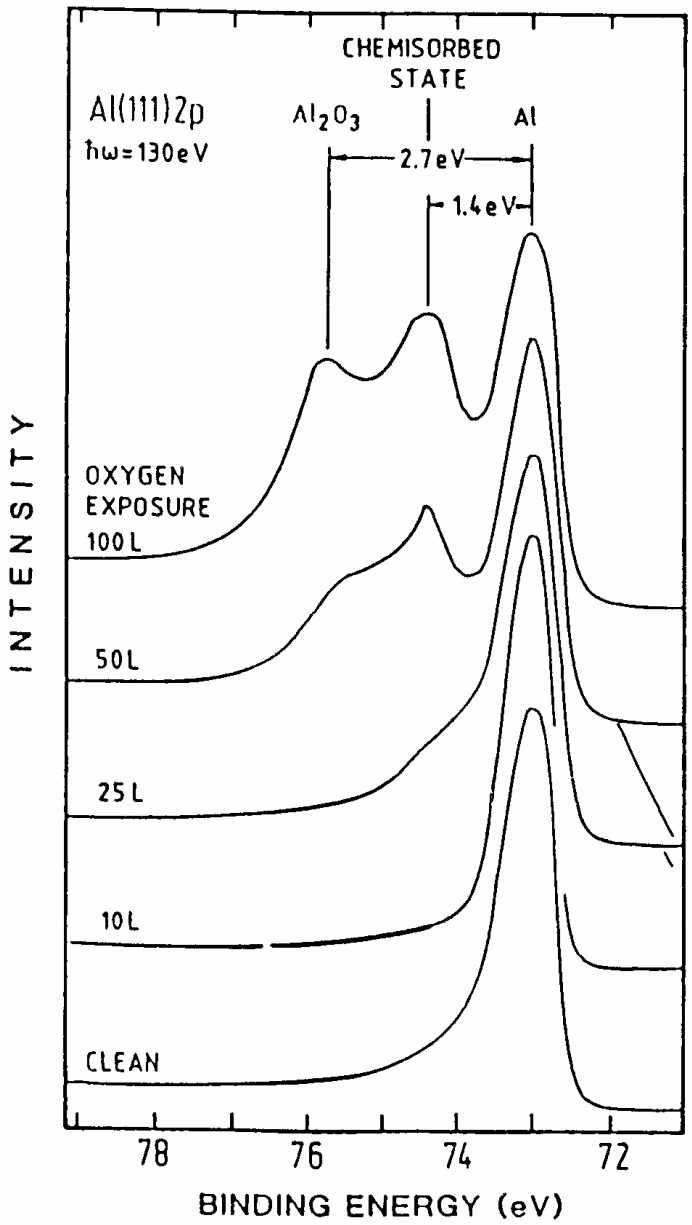


Fig.2.33. Oxidation of a (111) surface of Al monitored via the Al 2p level with $\hbar\omega$ = 130 eV synchrotron radiation [2.75]. The development of a chemisorbed state and subsequent oxide formation can be observed

We can study evolution of surface species. This helps us to understand the origin of reactivity.