On the Surface Chemical Reactions of Metal and Oxide XPS Samples at 300-400°at a High Vacuum Produced by Oil Diffusion Pumps(Chemistry)

Cu-Si alloys have been carried out on single crystals with four crystallographic orientations by a crossed-slit geometry. The results on both the alloys are nearly the same. The ⟨111⟩-neck radius and the ⟨100⟩-radius of the Fermi surfaces increase almost linearly with increasing electron concentration in accord with previous results on Cu-Al and Cu-Zn alloys. The Fermi surface does not touch the square faces of the Brillouin zone at the solubility limit. The results agree fairly well with a calculation based on the sinking-conduction band model.

Chemistry

On the Surface Chemical Reactions of Metal and Oxide XPS Samples at 300-400° at a High Vacuum Produced by Oil Diffusion Pumps

Kichinosuke HIROKAWA, Fumihiro HONDA and Masaoki OKU

J. Electron Spectrosc. & Relat. Phenom., **6** (1975), 333.

Metal and oxide surface reactions formed by heating in the spectrometer at 300–400° at a vacuum of ca. 10^{-9} Torr (oil diffusion pumps) were studied. As a result of spectral observations before and after heating, the metals studied were classified into five groups. In the first group, oxide films on the metal surface are easily evaporated because of the high vapour pressure of oxide; in the second, the oxide films are easily reduced in the spectrometer; in the thrid, the oxide film formed on the metal is reduced but the bulk oxide is not easily reduced; in the fourth, very stable oxide films are formed and the bulk oxide is also stable; and finally in the fifth, the oxide film formed on the metal is apparently reduced, yet the bulk oxide is very stable.

Photoelectron Spectral Intensities of Some First Transition Series Elements in Metal Cyanides Containing Inequivalent Atoms

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J. Electron Spectrosc. & Relat. Phenom., 6 (1975), 451.

Photoelectron spectral intensities of some first transition series elements were studied for metal cyanides containing inequivalent atoms. The spectra of low-spin ions coordinated via carbon to the cyanide ion, and of high-spin ions coordinated through nitrogen were separately obtained from manganese, iron, and cobalt cyanides. Metal 2p spectra obtained as sums of the appropriate spectra of low- and high-spin ions were nearly coincident with the spectra of the compounds containing inequivalent atoms. These results show that the intensity of the 2p electron for each atom must include the main peak and perhaps multiplet splitting effects, shake-up effects, and the inelastic scattering tail, and verify the non-interaction nature of the inequivalent atoms in these compounds.