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Investigation of Fe/CuO Interface by X-ray Photoelectron Spectroscopy[1] A. CHOURASIA, R.L. MILLER, H. DONG, J.L. EDMONDSON, Texas A&M University-Commerce — The Fe/CuO interfaces have been investigated by x-ray photoelectron spectroscopy. Thin films of iron were deposited on copper oxide substrates at room temperature. The spectral data show considerable reactivity at the interfaces. The spectral data have been compared with those of the oxidized iron and confirms the formation of the iron oxide at the interface. The interface is found to consist of a mixture of iron oxide and elemental copper. Presence of unreacted iron near the interface has been observed for thicknesses equal to or greater than 0.9 nm of the iron overlayer. The interface was also prepared by depositing 2.0 nm of iron on the copper oxide substrate under two different conditions. In one, the substrate temperature was kept constant during the deposition of the iron overlayer. In the other, post deposition annealing of the sample was performed. The iron overlayer was observed to be completely oxidized at the sample temperature of 450 °C and the oxidation is independent of the processing conditions. The amount of elemental iron and iron oxide in the samples has been estimated by modeling the spectrum using the spectra of elemental iron and pure iron oxide. The investigation provides a new method of preparing sub-nano-oxide films of iron.

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