

X-ray Absorption Near-edge Studies of $\text{Au}_{1-x}\text{Pt}_x$ alloys

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Since Au-Pt alloys have various atomic structures depending upon composition and annealing temperature, it is very interesting to investigate the electronic structures of alloys. We studied the changes of the electronic structure in the Au-Pt alloys by x-ray absorption near edge spectroscopy (XANES). Two kinds of Au-Pt alloy samples were prepared by arc melting methods and ion-beam-mixing technique. The Pt $L_{2,3}$ -edge and Au $L_{2,3}$ -edge X-ray absorption spectra (XAS) were measured with the electron yield mode detector at the 3C1 beam line of the Pohang Light Source (PLS). It was found that there was a substantial decrease in the area of the Pt $L_{2,3}$ white lines compared with that of pure Pt. The observed decrease in white line area was attributed to an increase in the number of $5d$ -electrons at the Pt site upon alloy formation. However, the Au $L_{2,3}$ edge spectra for Au-Pt alloys are all similar to that of pure Au. This implies that the $5d$ hole count of Au is not changed by alloy formation with Pt.

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