

**[M-02]**

## **Properties of Fe-Au alloy films near the structural transformation region**

현영훈\*, Y. V. Kudryavtsev\*\*+, R. Gontarz\*\*, 남창우\*, 이영백\*

\*한양대학교 물리학과

+Institute of Metal Physics, Kiev, Ukraine

\*\*Institute of Molecular Physics, Poznan, Poland

Fe-Au alloys are characterized by the complete solubility, and form and exhibit an fcc-bcc structural transformation near the Fe-rich side of the system. The optical and magneto-optical properties of Fe-Au alloy films, and the influence of the structural fcc-bcc transformation on the electronic structure of the alloys are studied. The magneto-optical (equatorial Kerr effect : EKE) and optical properties of  $\text{Fe}_{1-x}\text{Au}_x$  ( $0.10 < x < 0.93$ ) were investigated in the 0.5 - 5.0 eV energy range. The x-ray diffraction study shows the structural bcc-fcc transformation around 80 at.%. Noticeable changes in the optical properties of the alloys come from the structural bcc-fcc transformation :  $\text{Fe}_{1-x}\text{Au}_x$  alloys with the bcc phase have an absorption peak at 2.1 - 2.2 eV (which results from the Fe peak at 2.4 eV) in the optical-conductivity spectra. This absorption peak disappears in the fcc phase. The shape and intensity of the EKE spectra as well as the field dependence of the magneto-optical response are also significantly changed. The first-principles calculations on the electronic structure and the optical properties of the Au-Fe alloys are used to explain the obtained results.