

Characterization of Fe ion Implanted Ceramics

H.G. Jang, H.K. Kim*, D.R.Son**, D.W. Moon*, and C.N. Whang

Department of Physics, Yonsei University

* Surface Analysis Lab., Korea Research Institute of Standards and Science

** Department of Physics, Hanmam University

In order to study the magnetic property modification, Fe ions were implanted into non-magnetic material(eg. ceramics). Fe ions were generated with sputter ion source to a total beam current of 50 μ A. Implantation were performed into cermaics at room temperature with 80-keV ^{57}Fe ions to a dose range of 2×10^{17} ions/cm². The implanted specimens weres investigated by Ruthford Backscattering spectroscopy(RBS) and X-ray Photoelectron spcetroscopy(XPS).

Fluxmeter and Superconducting quantum interference device(SQUID) have been used to investigate the magnetic properties of ceramics. Ferromagnetic property was found in as-implanted state. Change of magnetic properties due to annealing temperature ranging from 700 °C to 1500 °C in vacuum for 1 hour are being studied. The phase of Fe ions implanted specimens were studied superparamagnetic or ferromagnetic, depending upon the annealing temperature by Glancing X-ray diffaction(GXRD) and X-ray photoelectron spectroscopy.