

[III-54]

## Characteristics of Polymer irradiated by Low Energy Ion Beam

Sung Han, Ki-Hyun Yoon\*, Hyung-Jin Jung and Seok-Keun Koh

Thin Film Technology Research Center, Korea Institute of Science and Technology

\*Department of Ceramic Engineering, Yonsei university

Recently, low energy ion beam irradiation has been adopted for surface modification. Low energy ion beam irradiation has many advantages in polymer engineering such as weak damage, good adhesion, noticeably-enhanced wettability (less than 15 degree), good reproducibility, and so on. In this experiment, chemical reactions between free radicals and environment gas species have been investigated using angle-resolved XPS and TRIM code. In the case of low ion beam energy (around 1 keV), energy loss in polymer is mainly originated from atomic collisions instead of electronic interference. Atomic collisions could generate displaced atoms and free radicals. Cold cathode-ion source equipped with 5cm convex grid was used in an O<sub>2</sub> environment. Base and working pressure were  $5 \times 10^{-6}$  and  $2.3 \times 10^{-4}$  Torr. Flow rates of argon and oxygen were fixed at 1.2 and 8 sccm. Target materials are polyethylene polyvinylidene fluoride and polytetrafluoroethylene.