

## [II~23]

### SURFACE MODIFICATION OF POLYPROPYLENE AND POLYSTYRENE BY ION ASSISTED REACTION IN REACTIVE GASES ENVIRONMENT

Sung-Chang Choi, Won-Kook Choi, Hyung-Jin Jung, Seok-Keun Koh, and Hiung-Hoi Hur\*  
Ceramics Division, Korea Institute of Science and Technology, P.O.Box 131, Cheongryang  
Seoul, 130-150, Korea

\*Samyang group, R&D Center, 63-2 Hwaam-Dong, Yuseong-Gu Taejeon, Korea

#### ABSTRACT

Wettable surface of polypropylene and polystyrene have been accomplished by the ion assisted reaction, in which energetic ions are irradiated on the polymer with blowing oxygen gas near the surface. The energies of ions are varied from 0.3 to 1.2 keV, doses  $10^{14}$  to  $10^{17}$  ions/cm<sup>2</sup>, and blowing rate of oxygen 0 ~ 8 ml/min. Wetting angle and surface free energies of modified polymer are obtained by using an contact anglemeter. In spite of the oxygen non-contained polymer, wetting angle are decreased to 20 degree and surface energy are increased to 60 ~ 70 erg/cm<sup>2</sup> by ion assisted reaction in oxygen gases environments. Wetting angles are increased when the wettable polymers were exposed in air, but are remained in pure water. Improvement of surface energy is mainly due to the polar force, and surface analysis by x-ray photoelectron spectroscopy shows hydrophilic functional groups such as C=O, COO, CO, etc., are formed without surface damage after the ion assisted reaction treatment. Comparison between the conventional surface treatments and the ion assisted reaction show that ion assisted reaction is very effect to form hydrophilic group on polymer surface.

This work was financially supported by Samyang Co. LTD.