

[III~14]

Identification of Hydrophilic Groups Formation on Polymer Surface during Ar⁺ Ion Irradiation in O₂ Environment

Sung-Ryong Kim¹⁾, Won-Kook Choi²⁾, Hyung-Jin Jung²⁾, and Seok-Keun Koh²⁾

¹⁾ Samyang Group R&D Center, 63-2 Hwaan-Dong, Yusung-Gu, Taejeon, Korea

²⁾ Division of Ceramics, Korea Institute of Science and Technology, Cheongryang P.O. BOX 131, Seoul 130-650, Korea

PP, PS, and low density PE, which consist of only carbon and hydrogen, were modified by Ar⁺ ion beam in oxygen gas environment at room temperature. Ar⁺ ion was irradiated at 1 keV with 1×10^{14} - $1 \times 10^{17}/\text{cm}^2$ at constant ion beam fluence and a flow rate of oxygen varied within 0 - 6 ml/min. After irradiation, advanced contact angles of modified polymer surface to distilled water were measured using goniometer-type Anglometer.

Decrease in contact angle after surface treatment with Ar⁺ ion in O₂ was regarded as the increase in surface energy, especially due to increased polar force. The formation of hydrophilic group related to polar force was identified by XPS studies for treated polymer surface, in which O1s peak was born and the peak area was largely increased.