

**Improving Wettability of Polyethylene(PE) Surface  
by Ion Assisted Reaction**

**Jin-Woo Seok, Sung-Chang Choi, Hyung-Jin Jung, and Seok-Keun Koh**  
*Division of Ceramics, Korea Institute of Science and Technology*

**Jun-Seob Song**  
*Samyang R&D Center*

**Abstract**

Surface of polyethylene film was modified by ion assisted reaction in which ion beam was irradiated on polymer in reactive gas environment. Ion (argon and oxygen) beam energy was 1 keV, doses were varied from  $1 \times 10^{14}$  to  $1 \times 10^{17}$  ions/cm<sup>2</sup>, and amount of blowing oxygen from 0 to 4 sccm (ml/min). Wettability was measured by water contact angle measurement, and the surface functionality was analyzed by x-ray photoelectron spectroscopy. The contact angles of water to polyethylene modified by oxygen ion beam only decrease from 95 to 62 degrees, and surface energy was not changed much. The contact angles remarkably decrease to 28 degrees and surface energy increase to 67 erg/cm<sup>2</sup> when the films were modified by argon ion with blowing oxygen gases near the polyethylene surface. Improvement of wettability and surface energy are mainly due to the new functional of group formation such as C-O or C=O, which are known as hydrophilic groups from the XPS analysis, and the ion assisted reaction is very effective to attach oxygen atoms to form functional groups on C-C bond chains of polyethylene.

본 연구는 KIST와 삼양사(주)의 공동 연구 과제로 수행되었음.