

## [II~26]

### **Improving wettability of polymer surface(HEMA, PMMA) by Ar<sup>+</sup> ion beam irradiation in oxygen environment**

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In order to improve wettability of polymer surfaces to triple distilled water, Ar<sup>+</sup> ions were irradiated on those surface under the various oxygen partial pressure. Cold hollow cathode ion gun was used for polymer modification. Polymer surfaces were irradiated under oxygen environment by Ar<sup>+</sup> ions with 1 keV energy. Amounts of Ar<sup>+</sup> ions were changed from  $5 \times 10^{16}$  to  $1 \times 10^{17}$  ions/cm<sup>2</sup>. Contact angles of water to HEMA and PMMA have been measured by Goniotype ERMA-Contact Anglemeter. The wetting angle of PMMA was reduced from 68 degree to 49 degree with only Ar<sup>+</sup> irradiation, and to 8 degree with Ar<sup>+</sup> irradiation in various oxygen gas flow rate (1 ml/min - 4 ml/min). The wetting angle to HEMA has been improved from 70 to 6 degree with Ar<sup>+</sup> irradiation under oxygen environment. The improved wettability of modified polymer surface may be explained in terms of two step process, in which the first step is to generate hydrophilic group through bond scissoring, carbonization, and crosslinking caused by ion bombardments, and the second one is the chemical reaction between oxygen and those unstable hydrophilic functional group. Hydrophilic groups of polymer surface to improve the wettability were investigated by XPS. Morphology of irradiated polymer surface was analyzed by AFM.