

## Improvement of hydrophilicity in hard contact lens : (Modification of PMMA-based polymer by IAR)

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Polymethylmethacrylate (PMMA) has been widely used as the hard contact lens. In order to apply the polymer to contact lens, the properties such as hydrophilicity, gas permeability, biocompatibility, etc. were required. In case of PMMA hard contact lens, there is drawback of low gas permeability. Therefore, PMMA were blended with silicon rubber of high gas permeability to improve the functionality of contact lens. However, silicon rubber show the hydrophobicity to reduce the biocompatibility. It is necessary that the wettability of PMMA blended with silicon rubber should be improved to result in increasing biocompatibility. In this study, PMMA blended with silicon rubber was modified to increase the wettability of the polymer surface by Ion assisted reaction (IAR). Oxygen ion irradiation with various oxygen flow rates was carried out to improve the wettability of the PMMA based polymers. PMMA based polymers treated by IAR were pure PMMA, PMMA blended with silicon rubber of 10 %, 20 %, and 30 %, respectively. IAR modified-PMMA based polymers showed the improvement of wettability resulting from formation of hydrophilic groups induced from ion assisted reaction. Changes of wettability of PMMA based polymer with modification conditions were investigated with contact angle of water and formamide. From these results, the improved hydrophilicity were discussed in terms of the surface energies including the polar force and dispersion force. XPS analysis of non-treated and IAR modified PMMA based polymers was conducted to characterize the newly formed functional groups leading to improvement of hydrophilicity.