CHAPTER V

CONCLUSION AND SUGGESTION

The efficiency of graft copolymerization of hydrophilic monomers, PEGMA, VPy, MPC, on NR latex films was influenced by the grafting time and the monomer concentration. In general, a higher concentration and a longer grafting time led to a higher grafting density and yield. Under the same condition, the grafting yield of vulcanized NR latex film was lesser than that of the unvulcanized NR latex fims. This can be explained as a result of the crosslinked network generated during vulcanization acting as an obstacle to the permeation of the photosensitizer as well as the monomer. The water contact angle results revealed that the hydrophilicity of the NR surface can be enhanced by graft copolymerization.

According to water contact angle data of the modified NR latex films, the surface grafting density became higher as the grafting time and the monomer concentration increased. The success of grafting was also confirmed by ATR-IR analysis. An appearance of a characteristic carbonyl stretching on NR latex films after the surface grafting by PEGMA and MPC indicated that the modification has proceeded at least to the sampling depth of ATR-IR (~1-2 μm). Unlike NR latex films graft copolymerized by PEGMA and MPC, those were graft copolymerized by Vpy did not show the same characteristic peak suggesting that the modified thickness was very thin. Among three monomers used in this study, Vpy presented the least extent of grafting presumably because of its limited solubility in natural rubber matrix.

The completely absence of plasma protein adsorption and platelet adhesion on the densely grafted NR latex films strongly suggested that blood compatibility of NR latex films can be significantly improved. Although additional tensile strength was introduced to the NR latex films after graft copolymerization, the overall mechanical properties were not adversely affected. This study has demonstrated that

graft copolymerization of hydrophilic monomers is an effective and versatile method for improving blood compatibility of natural rubber.

The stability of surface modified NR latex films as a function of storage time should be a subject of future investigation. In order to use the surface-modified NR latex films as material for making tubings and catheters for biomedical applications, *in vivo* tests may be neccessary. Due to an increase in surface hydrophilicity of NR latex film after surface modification, this NR latex film may be a potential material for making medical gloves.