

CHAPTER IV

CONCLUSIONS

Polymer films made of chitosan were modified by immersing the films in a solution containing aldehyde derivatives. The amino groups of chitosan were modified by reductive alkylation using butyraldehyde and aldehyde derivatives of EG. The grafting evidences were revealed by identifying changes of functional groups, i.e. alkyls, amines, and ethers, using ATR-IR and NMR analyses.

The treated films showed various surface properties depending on the structure of aldehyde used. Air-water contact angle measurement was used to determine the hydrophobic/hydrophilicity of the film surface. It was found that the hydrophilicity of the film modified with MTEG or MPEG increased. On the other hand, the resulting *n*-butyl chitosan film became more hydrophobic. In protein adsorption study, lysozyme and albumin were chosen as model proteins that differed in their isoelectric points (pI). The adsorptivity of both proteins on the film surface decreased after the films were grafted with MTEG or MPEG. This is because of the flexibility of MTEG/MPEG chains that hinders the approaching protein molecules.

In the future, the condition of the reaction should be optimized for improving the reaction efficiency. The duration time of protein adsorption could be optimized to obtain a maximum adsorption. Furthermore, these modified chitosan films should be tested for their activity towards plasma proteins and platelet.

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