

CHAPTER 5

CONCLUSIONS

Oil-in-water microemulsion as a carrier of water insoluble initiator was employed aiming at introducing AIBN into cellulose structure. The presence of AIBN within cellulose is important in order to initiate the in-situ polymerization. The obtained results showed that oil-in-water microemulsion based on CTAB-benzene/propanol-water system was the most effective technique for the introduction of AIBN into cellulose.

Sizes of microemulsion droplets in the range of 161-167 nm, measured by light scattering photometer, were successfully prepared and preferable in order to accommodate the amorphous region of cellulose.

Cotton fabric was treated in the microemulsion solution at liquor ratio of 20:1 for 2 hr to allow the maximum absorption of microemulsion droplets.

Following oil-in-water microemulsion treatment, in-situ polymerization of methacrylic acid inside cellulose was carried out. The evidence of FTIR analysis showed that the treated cotton fabric contained the polymethacrylic acid. The fabric containing polymethacrylic acid exhibited good dyeability with a basic dye without requirement of auxiliaries, albeit possessing unsatisfactory fastness properties.

Optical microscopic analysis of dyed fabric revealed that polymethacrylic acid could be found at the inner of cotton yarn compared to graft polymerization tended to occur on the fiber surface.

Overall, the microemulsion technique is possible to be used for the modification of cellulose.