

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The important factors affecting the characteristics of polystyrene formed in wormlike micelles of CTAT surfactant were surfactant concentration, monomer loading, initiator loading, and polymerization temperature. This study would be useful for researcher to predict the best condition for different applications of polymerization by controlling the characteristic of polymer and morphology of polymer stabilized micelles formed.

The CMC was measured as a function of surfactant concentration by surface tension and conductivity. It showed that the first concentration of CTAT surfactant to formed micelles is 0.011 %wt at 30 °C.

The investigated process variables (CTAT concentration and styrene loading and initiator loading) significantly affect the characteristics of the obtained polymer. The results show that the molecular weight of obtained polystyrene increased with increased solubilized styrene but decreased with CTAT concentration and AIBN feed.

These parameters also affected the structure of micelles. Increasing the surfactant concentration and styrene loading, and decreasing AIBN loading increased the length of polystyrene stabilized wormlike micelles. The polymerization temperature that should be utilized in order to obtain relatively high molecular weight polystyrene and long polystyrene stabilized wormlike micelles is 70 °C.

When comparing all conditions, 20 %wt CTAT, 50:1 of styrene to AIBN ratio and high styrene level (1.6:1) at 70 °C produced the highest molecular weight of polystyrene and longest polystyrene stabilized wormlike micelles.

In further study, the effect of initiator loading on the length of polystyrene stabilized wormlike micelles will be investigated further. Moreover, these polystyrene stabilized wormlike micelles can be functionalized by attaching specific groups for use in separation or filtration in pharmaceutical application.