CHAPTER V

CONCLUSIONS AND RECOMMENDATION

In this research, admicellar polymerization of PS on NR particles was studied. The suitable conditions for admicellar polymerization were investigated. The suitable pH for polymerization was achieved from EM measurement and the isoelectric point of NR was equal to 3.3. The pH higher than 3.3 was chosen because at pH lower than the isoelectric point, the stabilizer for NR particles was hydrolyzed resulting in the coagulation of NR. The pH 8 was chosen to get highly negatively charged surface of NR because the surfactant used in this experiment was CTAB, which is a cationic surfactant. The equilibrium time for CTAB adsorption was observed to get the suitable time for complete CTAB adsorption. It was found that the adsorption did not increase significantly with time. However, the time for surfactant adsorption in this experiment was 15 hrs. CTAB adsorptions on NR 888 and 692 μM for equilibrium CTAB concentration with 0 M and 1 mM of NaBr, respectively. To avoid micelle formation, the initial concentration of CTAB in this experiment was 1000 μM which gave an equilibrium CTAB concentration lower than CMC. Moreover, the adsorption isotherm experiment showed that higher concentration of NaBr, resulted in absorption capacity of CTAB. It was found that the higher initial styrene concentration, which gave higher equilibrium styrene concentration, the higher the styrene adsolubilization. The effect of NaBr on styrene adsolubilization showed the same trend as in adsorption isotherm. The products from admicellar polymerization were characterized by FTIR and TGA. FTIR spectra showed the combination of characteristic peaks of NR and PS. The intensities of the PS peak increased with the % weight of PS. The TGA results did not show the significant character of PS at low % weight of PS but at high % weight of PS, it showed a slight change in the degradation rate.

Recommendation for future work

In this work, polystyrene was coated on natural rubber particles by admicellar polymerization process using V50 as the initiator, 2:1 styrene:V50 ratio,

polymerization time of 15 hrs. For the future work, the type of initiator, the monomer:initiator ratio, and the time for polymerization can be varied to study the effect of these parameters on the amount of polystyrene coated on natural rubber. Moreover, the morphology of polystyrene coated on natural rubber particles should be studied together with possible applications of the products obtatined.