



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

From the experimental results, it demonstrates that both surfactant adsorption structures and the molar ratio of CTAB to Triton X-100 are important controlling variables to control and optimize the admicellar polymerization process for industrial applications. Modification of the silica surface increased the mean agglomerate particle size and lowered BET surface areas as compared to that of the unmodified ones. Scanning electron microscope (SEM) showed that the particle size of the modified silica was increased after the modification. The TGA results confirmed the polymer formed on the silica surface.

The silica modification by the nonionic surfactant was successfully used to modify rubber compound, the properties of rubber compound modified by silica using the nonionic surfactant mixed with the cationic surfactant in monolayer adsorption structure are acceptable compared to those of rubber compound modified by silica using pure cationic surfactant (bilayer adsorption structure). However, the use of nonionic surfactant can reduce the cost of the modified silica about 3 time less than the modified silica using the pure cationic surfactant.

5.2 Recommendations

Kneder internal mixer was used for mixing in this study. Even, the mixer is a laboratory scale mixer with volume of 5 liters, the modified silica obtain from laboratory scale is not enough to fill the optimum volume of mixer. Thus, low dispersion of modified silica in natural rubber results in low cut growth resistance of the rubber compound.