

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Surface modification of precipitated silica by admicellar polymerization using a continuous stirred tank reactor was successfully employed to produce the reinforcing fillers capable of improving the compound's physical properties.

Surfactant and initiator loadings are important variables that can be controlled to optimize the system for industrial applications. Modification of the silica surface increased the mean agglomerate particle size and lowered BET surface areas as compared to the unmodified silicas. The scanning electron microscope (SEM) monographs showed that the particle size of the modified silica increases after the modification. With Fourier Transform Infrared Spectroscopy (FT-IR), the existence of poly(styrene-isoprene) on the silica surface was verified. The amount of polymer formed on the silica surface was determined by using Thermo Gravimetric Analyzer (TGA). The present study shows that the rubber properties can be maintained by reducing the amounts of surfactant and initiator used.

5.2 Recommendations

For the rubber mixing with modified silica, the retention time should be investigated, in order to look at the cut growth resistance parameter in terms of mixing time/shear.