



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this study, a continuous stirred tank reactor was successfully employed to modify silica surface using *in situ* admicellar polymerization. After the admicellar polymerization step, all the treated silicas were found to have lower BET surface areas but larger mean agglomerate particle sizes as compared to the unmodified silicas. Scanning electron micrographs (SEM) also showed the different size appearance between the unmodified and the modified silica. The FTIR results of the extracted material from the modified silicas proved the existence of poly(styrene-isoprene). The sample with the highest calculated amount of the polymer was 5 g co-monomer loading at 30 min retention time.

In comparison between the modified silicas produced from the continuous reactor and batch reactor, the continuous system of the present study could produced better modified silicas than the previous batch system in terms of the rubber compound physical properties.

At 5 g co-monomer loading with low retention time (30 min) provided the highest overall improvement of surface characterization and rubber compound properties.

5.2 Recommendations

Instead of AR grade CTAB, a commercial grade should be used in order to reduce the polymerization cost.

For the system operation, the window of retention time should be longer than that in this work.