

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

All triblock copolymers used in this study were shown to preferentially adsorb onto the hydrophobic silica surface. The adsorption isotherms of P123, L64, 17R2, 25R4, and 10R5 seem to be Langmuirian in shape. For L31, which has a low number of EO groups, the adsorption isotherm shows two plateau regions because of a two step adsorption process. The configuration, HLB values, and EO/PO ratio of copolymers are apparent factors for adsorption behavior. The Pluronics show higher adsorption than the reverse Pluronics. Lower HLB values and EO/PO ratio tend to have higher adsorption. In addition, the hydrophobic silica is a better substrate for EO/PO triblock copolymers than hydrophilic silica because a larger range of HLB values can be effectively used.

All triblock copolymers have shown to have high adsolubilization for the tested aromatic organic compounds (phenol, 2-naphthol, and naphthalene). For phenol and 2-naphthol adsolubilization where the adsorbed amount of each copolymers used in the study are different, the adsolubilization increased with increasing amount of adsorbed copolymers. The EO/PO ratio and number of EO groups of copolymers have a strong impact on phenol adsolubilization; high EO/PO ratio and high number of EO group cause high adsolubilization, while 2-naphthol adsolubilization was affected by only the number of EO groups in the same trend with phenol. For naphthalene, the adsolubilization has shown to be nearly the same for all copolymers studied with the exception of L31, which shows the lowest value. In addition, the effect of size and polarity of organic molecules have an enormous effect to the adsolubilization behavior. Smaller organic molecules can be adsolubilized into the copolymer surfactant admicelle to a much higher degree than the larger ones, and the polar organic molecules adsolubilized to a greater degree than the tested non-polar organic molecules.

5.2 Recommendations

Further study should be conducted to improve the adsorption of EO/PO triblock copolymers onto solid particle and adsolubilization of model organic compounds by using some additives like linear alcohols.