

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Our results indicate that specific adsorption and adsolubilization isotherms are influenced by the pH of the systems. At every equilibrium concentration, CTAB adsorption on Hi-Sil 255 silica at pH 8 was higher than the CTAB adsorption at pH 5. The maximum adsorption of CTAB on silica at pHs 5 and 8 are approximately 500 and 600 $\mu\text{mol/g}$, respectively. This is probably due to the increased surface charge allowing better packing of surfactant on the silica surface. The adsolubilization of toluene and acetophenone increased with increasing equilibrium concentration in the aqueous phase. Additionally, the adsolubilization at pH 8 was higher than the adsolubilization at pH 5 for both solutes. Current adsolubilization equilibrium constant (K) theory predicts that the location of adsolubilization for acetophenone is in the palisade region, while that of toluene is both the core and palisade regions. The increase in adsolubilization for toluene is probably due primarily to the increase in surfactant adsorption, while the increase for acetophenone is probably due primarily to an increase in the polarity of the admicelle at a pH farther from the point of zero charge. Maximum toluene adsolubilization was 270 $\mu\text{moles/gram}$ while that of acetophenone was 450 $\mu\text{ moles/gram}$.

In the mixed solutes system, the adsolubilization of toluene is slightly higher in the presence of added acetophenone. The adsolubilization isotherms of acetophenone are much higher in the presence of added toluene. This is possibly due to (1) acetophenone forcing water out of the palisade region, making the interior of the admicelle more nonpolar, (2) the presence of toluene

swelling the admicelle, providing more space for adsolubilization in the palisade region, and (3) hydrophobic interactions between the two molecules.

5.2 Recommendations

We usually study both effect pH and ionic strength. This research ignored the effect of ionic strength. It is supposed for further study that we should investigate the effect of ionic strength on adsolubilization.