



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this study, adsorption and wetting on different hydrophobic surfaces with aqueous mixed solutions of cationic surfactant — cetylpyridinium bromide (CPB), and nonionic surfactant — polyoxyethylene octyl phenyl ether (OP(EO)₁₀), were investigated at different molar fractions of the nonionic surfactant of 0.25, 0.50, and 0.75. Six plastics used were high density polyethylene (HDPE), polycarbonate (PC), polyvinylchloride (PVC), acrylonitrile butadiene styrene (ABS), polymethyl methacrylate (PMMA), and polyhexamethylene adipamide (Nylon66).

From the results obtained, the mixed surfactant systems showed a positive effect in adsorption with increasing molar fraction of nonionic surfactant, leading to wetting improvement. The addition of the nonionic surfactant into the CPB solution increased the CPB adsorption onto the studied plastic surfaces because of the reduction of electrostatic repulsion among cationic head groups and it also increased the surface excess concentration at the solid/liquid interface. Surfactant molecules likely adsorb at the liquid/vapor interface more than at the solid/liquid interface when the polarity of surfaces increased. Interestingly, the masking of negative charge plastic surfaces by the CPB monomeric adsorption obstructed the OP(EO)₁₀ adsorption. In addition, wetting of the studied plastic surfaces was found to increase with increasing polarity of surfaces.

5.2 Recommendations

1. The structure of surfactants seems to have an effect on wettability which should be studied further.
2. The effect of pH is recommended for further study. The range of pH should cover a point of zero charge (PZC) of the polar plastics.