CHAPTER V
CONCLUSIONS

In this study, it was found that the activity of *R. delemar* lipase catalyzing esterification in NaDEHP reverse micelles strongly depends on the microstructure of reverse micelle. Water content in the reverse micelle was controlled by the system parameters, i.e. the type, concentration, and structure of substrates and Wo had significant effect on kinetics of reaction observed. It can be seen that *R. delemar lipase* gave high initial rate of esterification with long chain fatty acid, exceptionally high rate with palmatic acid at the same Wo value. Moreover, the long chain alcohol can act as a good cosurfactant as well as substrate and also gave high esterification rate. *R. delemar* lipase seems to show selectivity on long chain alcohol, hexanol, better than the short chain 1-propanol and 2-propanol. The structure of cosurfactant changed the localization of lipase in microemulsion. The localization of lipase close to the oil and water interface was due to the long chain fatty acid and long chain alcohol acting as a good cosurfactant that penetrated well to the oil and water interface and resulted in fast esterification rate, compared with the short ones. *R. delemar* lipase showed a strong dependence on the water content of microemulsion and the optimun Wo was about 6 for the case of caprylic acid. The change in microemulsion system also affected the change of size, water content, and the localization of *R. delemar* lipase in reverse micelle resulting from the hydrophobic/hydrophilic character of protein.

The esterification rates obtained in microemulsion media were found to be 50-100 times those obtained in general oil/water media. It might be due to the appropriate water content in microemulsion promoting the lipase activity to catalyze esterification reactions. However, The results showed rapid loss of enzymes activity in less than 30 min, which further investigation is needed.