



CHAPTER V

CONCLUSIONS

D-panthenol microcapsules for topical cosmetic products could be prepared by interfacial polymerization using proteins with terephthaloyl chloride (TC). Proteins such as bovine serum albumin (BSA), ovalbumin and gelatin were studied. In this experiment, the obtained microcapsules from BSA and ovalbumin with 2.5-5% w/v TC were sphere with smooth surface. Both microcapsules were shrunk after drying and capsules collapsed. Gelatin microcapsules were irregular and could not retain as microcapsules. BSA and ovalbumin were suitable to prepare D-panthenol microcapsules. However, BSA was more preferable when microcapsules were prepared. Ovalbumin had more impurities and gave a lot of bubble in the carbonate buffer pH9.8.

In order to obtain optimum condition for preparing BSA-TC microcapsules, Factors effecting the microcapsule preparations were studied; these included concentrations of BSA, concentrations of TC and stirring rates. Concentration of BSA did not influence the morphology of microcapsules when concentration of TC was fixed. Only the percentage yield increased when increasing concentration of BSA. Increasing in concentration of TC influenced in microcapsule formation. At high concentration of TC it induced the thickness of wall. BSA-TC microcapsules wall was very thin and fragile when percentage of TC was lowered to 1.25 % w/v. BSA-TC microcapsules were sphere with smooth surface. The mean particle size were between 91-377 μm when the stirring rate was 800 rpm. The stirring rate was an important factor to control the size of BSA-TC microcapsules. Increasing the stirring rate in polymerization influenced the particle size. The particle size of BSA-TC microcapsules was decreased to 30 μm when stirring rate was increased to 11000 rpm.

In order to obtain the best condition for preparation of D-panthenol microcapsules, the D-panthenol loading with varied concentrations of BSA from 13.3-20% w/v were studied. Increasing in D-panthenol concentrations affected the physical appearances of microcapsules. D-panthenol microcapsules were irregular in shape with rough surface. The sizes of microcapsules were bigger than blank BSA-TC

microcapsules. The mean particle size was between 349-660 μm depended on the concentrations of BSA and D-panthenol loading.

The yield of D-panthenol microcapsules was 80-90%. The percentage of entrapment was 68.2% when D-panthenol was added at 13.3% w/v in 20% w/v BSA solution. D-panthenol microcapsules were powdery and free flowing when drying. Further studies such as stability, effect of pH and formulation should be investigated before using these microcapsules in cosmetic products.