CHAPTER V

CONCLUSIONS

The present study was designed to develop sustained release microcapsules of minocycline hydrochloride using the water-in-oil-in-water (w/o/w) solvent evaporation technique. The factors influencing microencapsulation, i.e., type of polymer, stabiliser concentration, and core to wall ratio were evaluated from percent yield, size distribution, drug content, core entrapment, and the drug release properties. The results of the investigation are concluded as follows :

The appropriate conditions of preparation of minocycline hydrochloride microcapsules by the w/o/w solvent evaporation technique from poly (L-lactide), poly (DL-lactide), poly (DL-lactide-co-glycolide) 75:25, and poly (DL-lactide-co-glycolide) 50:50 were 0% sodium carboxymethylcellulose, 1:5 core to wall ratio, 0.25% w/v polyvinyl alcohol, and stirring rate of 300 rpm.

Poly (DL-lactide-co-glycolide) 50:50 was not suitable to prepare minocycline hydrochloride microcapsules because it gave low percent entrapment and drug release.

Poly (DL-lactide-co-glycolide) 75:25 gave high percent entrapment similar to poly (L-lactide) but the release profile was higher than poly (L-lactide) and poly (DL-lactide), respectively.

The release kinetics of minocycline hydrochloride from microcapsules prepared with all polymer types followed first-order.

The result of this study showed that minocycline hydrochloride microcapsules prepared using this technique had low core entrapment and drug release but they had concentration within therapeutic range (>1μg/mL) (Mashimo et al., 1981). Furthermore, It was found that residual dichloromethane content of microcapsules prepared from poly

(L-lactide), poly (DL-lactide), and poly(DL-lactide-co-glycolide) 50:50 had residual organic solvent conforming to the United States Pharmacopeia limits. Poly (L-lactide) and poly (DL-lactide) were suitable to prepare sustained release microcapsules of minocycline hydrochloride because they displayed extended release profile more than 48 hours.

For further study, these technique should be developed to increase the percent entrapment of minocycline hydrochloride microcapsules. Moreover, *in vivo* experiments should be investigated in order to confirm the therapeutic value of this controlled delivery system.