

## CHAPTER V

### CONCLUSION

#### 5.1 Conclusion

Polymer thin films prepared using the layer-by-layer (LbL) technique can provide nanostructure coating for improved loading of hydrophobic molecules. In this work, films fabricated by alternative layers of cationic poly(diallyldimethylammonium chloride) (PDADMAC) and anionic poly(sodium 4-styrene-sulfonate) (PSS) were loaded with 1,7-bis-(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-2,5-dione (curcumin), which is a therapeutic compound in medical applications and used as a hydrophobic drug. The PEM films were characterized by atomic force microscopy (AFM) and Ellipsometry while the amount of CUR in the films was measured by UV-visible spectroscopy. The temperature and solvent composition play a major roles of the loading of curcumin into PEM thin films with its solubility, the loading of curcumin into PEM thin films increases with increasing the polarity of solvent which can controlled by solvent composition forced by solid-liquid partitioning mechanism. The loading decreased with increasing temperature driven by the rising of solubility of curcumin in each temperature mediated. The loading was found to saturate in each condition after 3 hours. In conclusion, the PEM can be used as a coating for loading of hydrophobic molecules directly on the surface of materials. Moreover, The film surface treated by sodium dodecyl sulphate (SDS) surfactants was found to multiple increases the final loading of curcumin in the films.