CHAPTER VI

CONCLUSIONS

In this study, zinc nitrate hexahydrate was converted to ZnO nanoparticles which were confirmed by XRD technique. The glass transition temperature of ZnO/PI slightly increased when ZnO nanoparticles were higher than 35.1 mol% in PI film because ZnO confined chain of the polymer. However, the glass transition temperature of Zn nitrate/PI can not be observed. The degradation temperature of all hybrid films was lower than that of pure PI. However, the ZnO/PI films were more thermal stable than Zn nitrate/PI films.

35.1 mol% ZnO/PI emitted the highest light emission intensity which was 7.8 times higher than that of pure PI. Furthermore, the light emission of all ZnO/PI films was higher than that of pure PI. Adding only 5 mol% Zn nitrate enhanced light emission intensity by 1.9 times compared with pure PI. Moreover, the light emission of Zn nitrate/PI films showed red shifted compared to that of the pure PI films. It may be attributed from the aggregation of ZnO nanoparticles. For the effect of curing atmosphere on photoluminescence, the films prepared under nitrogen atmosphere emitted higher light emission intensity than that of films prepared under argon atmosphere. However, the effect of curing temperature slightly affected the light emission intensity.

From TEM image, ZnO nanoparticles showed an aggregation in PI films, most of the ZnO nanoparticles were large size (17-90 nm) and agglomerated in average size of ~ 114-150 nm. ZnO nanoparticles were well distributed but poor dispersed in PI films.