CHAPTER V

CONCLUSIONS

The characterization of homogeneity of polymer and polymer composites by spacular reflection cannot be achieved because the surface of specimen is not smooth enough. Therefore, the Kramers-Kronig (KK) transformation cannot be applied.

The characterization of homogeneity of polymer and polymer composites by ATR FT-IR microspectroscopy with the homemade slide-on Ge μIRE and slide-on diamond μIRE can be achieved. The surface and depth profile study of homogeneity by area mapping and line mapping, respectively, are efficient for characterizing the distribution of the component of polymer composites. Since the infrared absorption band is related to the chemical constituent and the absorption intensity is directly related to concentration of sample, the same spectral features indicated that the sample is homogeneity. On the other hand, if the sample shows different absorption magnitude greater than the noise level, the sample is not homogeneous. However, homemade slide-on Ge μIRE is not appropriate for investigating the hard and rigid solid specimens (*i.e.*, polybenzoxazine and its composites).

The homemade slide-on Ge μIRE has more advantage than the commercial hemispherical Ge IRE. Due to small contact area of the homemade slide-on Ge μIRE and slide-on diamond μIRE, it can be employed for the characterization of chemical changing at the small area.

Finally, it is concluded that the homogeneity of polymer and polymer composites can be investigated by ATR FT-IR microspectroscopy. The homemade slide-on Ge μIRE and slide-on diamond μIRE have the efficiency to characterize the homogeneity of polymer and polymer composites.