CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the conclusions and recommendation for further studies will be focused.

6.1 Conclusions

The following conclusions of this study were drawn:

1. The addition of small quantities (0.25, 0.5, 1.0%) of CBC33 to polycarbonate resulted in a significant decrease in the flow viscosity as measured in a capillary rheometer.

2. Shear viscosities of the blends of CBC33 are lower than that of pure polymer. For example, the addition of 1 percent by weight of CBC33 reduces the viscosity by about 10 times or 90 percent decreasing. This phenomenon proved that CBC33 can act as a plasticizer of PC. Therefore these can cause the reduction in the processing temperature of the PC which is important for plastic processing industries.

3. The addition of small quantities (0.25, 0.5, 1.0%) of CBC53 to polycarbonate resulted in a significant decrease in the flow viscosity as measured in a capillary rheometer.

4. Shear viscosities of the blends of CBC53 are lower than that of pure polymer. For example, the addition of 1 percent by weight of CBC33 reduces the viscosity by about 10 times or 90 percent. This phenomenon proved that CBC33 can act as a plasticizer of PC.

5. The reduction of viscosity is highly remarkable for PCM7, which is the PC with highest molecular weight. That is, the viscosities of PCM7 were reduced by about 90 percent but those of Bayer PC were reduced by about 65 percent for 1 percent addition of CBC33 and CBC53.

6. The additions of small amount of low molar mass liquid crystals do not affect the mechanical properties of polycarbonate. The tensile strength, extension, modulus of elasticity and work done do not significantly change as blended with liquid crystal polymer. The liquid crystal is suggested to affect the viscosity more than the tensile properties of the PC blends.

7. The DSC thermogram confirms that both CBC33 and CBC53 can act as plasticizers for polycarbonates as evidenced by the decreasing in the glass transition temperatures (T_g) of polycarbonates. Moreover, it was found that CBC53 was the better plasticizer of PC than the CBC33.

8. The viscosity of PC blend with HP35 and HP5N does not significantly change compared to that of the pure PC. On the other hand, the viscosity of PC blends with CBC33 and CBC53 is much lower than that of the pure PC. This might be because of the nematic orientation, which play an important role in polycarbonate processing.

6.2 Recommendations for Further Studies

From this study, the recommendations for further research are as follows:

1. This research can be extended to study the modifications for the mixing of the blends in order to use for commercial scale.

2. For further measurements of the viscosity by capillary rheometer, the Bagley and Rabinowitch corrections should be done to correct the viscosity value.

3. It should be interesting to study the phase diagrams of low molar mass liquid crystals. These informations may provide some guidelines in the optimum concentrations of low molar mass liquid crystal used in polymer blends.

4. Another low molar mass liquid crystals should be chosen for studying. The better liquid crystals for blending with polycarbonates may be found.