CHAPTER V
CONCLUSIONS

In this work, the morphology of dispersed phase in terms of number average droplet size was investigated as a function of shearing time and shear strain rate. The number average droplet sizes were found to reach the equilibrium on the ensemble mean average basis at the shear strain unit around 5000 and for the equilibrium on the statistical basis with monomodal size distributions at the shear strain unit around 10,000 for both high and low viscosity ratio blend systems.

For the effect of shear strain unit, the shear strain rates of 10 to 200 s-1 were chosen to study. The equilibrium droplet size decreased with increasing shear strain rate, meaning that only drop breakup process was observed in this experiment. The equilibrium droplet size was proportional to the shear strain rate with the power law slope of –0.3 that higher than the power-law slope obtained from Taylor's theory.

For the effect of elasticity, the correlation between two dimensionless parameters, capillary number (Ca) and the first normal stress difference ratio ($N_{1,r}$) was observed. Ca was found to increase approximate linearly with $N_{1,r}$ at any given value of the viscosity ratio. For a given value of $N_{1,r}$, Ca was found to be higher for a lower viscosity ratio. The capillary number of the viscoelastic systems was higher than that of a Newtonian system due to the effect of polymer elasticity.