CHAPTER V
CONCLUSIONS AND RECOMENDATIONS

Experimental results of droplet deformation in oscillatory shear have been presented in this work. Three effects of drop deformation have been studied: the effect of viscosity ratio; the effect of time scale ratio; the effect of elasticity.

For the oscillatory deformation of droplet at different viscosity ratios but at a fixed time scale ratio, the capillary number of the high viscosity ratio system is higher than the small viscosity ratio system at the same amplitude of deformation. This implies that the viscosity droplet has higher ability to resist the oscillatory deformation than the drop of low viscosity ratio.

For the effect of time scale ratio with G''_r is all unity, the amplitude of deformation is higher with decreasing time scale ratio. When the time scale ratio is high the drop cannot adjust itself fast enough so it behaves like a solid, and a small deformation would be observed. On the other hand, for low time scale ratio, the experimtental time is long enough to allow the droplet to behave like a liquid. Droplet can be deformed easier than droplet with higher time scale ratio.

For the effect of elasticity, the drop that has no elasticity deforms more than the elastic drop. The elasticity of droplet helps to resist the oscillatory deformation.

The breakup of Newtonian drops in an oscillatory flow is different from the steady state shear case. The breakup mechanism occurs only by end pinching. The higher oscillatory frequency produces more daughter drops than low frequency. The minimum critical capillary number of the high frequency is higher than low frequency.

The side view of deformed droplet and the effect of distance between drop and bottom plate should be further studied.