CHAPTER V

CONCLUSION AND SUGGESTION

5.1 Conclusion

HDPE/MLLDPE film can produce using the same condition of the HDPE/Z-NLLDPE and HDPE film. In spite of MLLDPE which has narrower molecular weight distribution than Z-NLLDPE because both of them are improved the processability by input the long chain branching into base resin. The changing from Z-NLLDPE to MLLDPE to blend with HDPE for industrial film, is not effect to the processing condition.

The mechanical properties of HDPE/MLLDPE film show superiority when compare with HDPE/Z-NLLDPE film. The tensile strength, impact strength and seal strength of HDPE/MLLDPE film are higher than HDPE/Z-NLLDPE film due to the small lamella size of MLLDPE which easy alignment, less lamella stack, during the processing. While elongation and stiffness of HDPE/MLLDPE are effect from the higher amorphous phase of MLLDPE than Z-NLLDPE. The high volume fraction of amorphous which contain freely mobile chain segment then HDPE/MLLDPE has higher elongation and less stiffness than HDPE/Z-NLLDPE. But the clarity of HDPE/MLLDPE film can not be improved due to cocrystallization between HDPE and MLLDPE. According to the DMA and DSC test, HDPE/MLLDPE blend is miscible in the crystalline phase but immiscible in the amorphous phase. The melt mixing by the single screw extruder is enough equipment to blend these resin.

The HDPE/MLLDPE film which downgauged from 25 micron to 15 micron has the same mechanical properties as HDPE/Z-NLLDPE film at 25 micron thickness. For industrial film production, MLLDPE can be replaced Z-NLLDPE for blending with HDPE and save about 37 percent of production cost. The other advantage of HDPE/MLLDPE downgauging is the easier tying and sealing the industrial bag.

5.2 Suggestion for further study

1. This research can be broadened further to compare the effect of mechanical properties and morphological of blend film which use the different HDPE base resin i.e., gas phase process compare with the solution process or bimodal molecular weight distribution compare with unimodal molecular weight distribution.

2. This research can be extended to study the HDPE/MLLDPE which is the LLDPE rich blend in the film properties.

3. This research can be extended to study the effect of the blown film condition such as blow up ratio, cooling rate, quench height, which is the distance from the exit of the die to the cooling, and film line speed due to the process condition will effect to the end use morphology and properties.