

CHAPTER V

CONCLUSIONS

The synthesis of graft copolymer of cassava starch and MMA monomer via free radical polymerization using benzoyl peroxide as an initiator in aqueous medium was studied in this research. From all the experimental data, the results can be concluded as follows.

Cassava starch-g-PMMA copolymer can be synthesized by the grafting technique chosen in this research. The formation of graft copolymer can be confirmed initially by FT-IR spectra. The absorption band of C=O stretching appears at 1730 cm^{-1} . This band is the characteristic band of carbonyl group existing in PMMA. Therefore, it indicates that PMMA was grafted onto cassava starch backbone. The formation of cassava starch-g-PMMA was also supported by SEM and GPC.

The grafting characteristics of the obtained cassava starch-g-PMMA were affected by several parameters including the amount of BPO, the amounts of reactants, and the reaction time. As a result, the optimum condition for grafting was obtained when 5 g of cassava starch, 5 g of MMA monomer, 0.1 g of BPO, and the reaction time of 3 hours were used. This condition provided a graft copolymer having 25.00 percent add-on, 81.40 percent monomer conversion, 54.30 percent homopoly(methyl methacrylate) formed, 45.70 percent grafting efficiency, 37.20 percent grafting ratio, and 95.54 percent yield.