CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

In this 1 year thesis, the master batches, LDPE compounded with Ag/Cu zeolite was successfully produced. The Ag/Cu zeolite was prepared by using commercial zeolite and stir with metal solution for 1 hour which is the simplest and cheap process. Before Ag/Cu zeolite was prepared, the adsorption behavior of Cu and Ag on zeolite was studied in order to optimize the process time and concentration of metal in filler production. From this study, we got 1 hour as an optimum production time and 7200 ppm of Cu^{2+} as an optimum concentration of copper solution. Furthermore, we can add Ag^{+} at the highest amount of zeolite can bear ion (for zeolite-A CEC is 5.23 meq/g)

In Master batch production, we use twin screw extruder as an equipment. The plastic pellet was successfully produce at ratio 100 g: 50g of LDPE to zeolite. The zeolite that excahnge with all Ag:Cu ratio was compound with LDPE. However, the metal in zeolite was reduced to metal oxdie which is a stable species. This can confirm by the color change of zeolite from blue to green in Cu/zeolite and to dark brown in Ag/zeolite. This is a problem in production because the reduction of mobile metal in zeolite cause the lower in antibacteria activity which is the main purpose of this thesis. The reduction in antibacterial activity could confirm by doing bacteria reduction test which showed that the only ratio of Ag:Cu that inhibited a bacterial growth was Ag:Cu = 2:1 master batch.

In my reccomendation for the future work, we still got high work load to do with. First, we need to find the way how to compound the polymer with zeolite with no metal reduction. Second, we need to measure the release of metal from master batches which is the most important part to predict the ability of master batch in inhinbiting bacteria growth. Third, we need to use master batches to mix with commodity plastic to find the good percentage of master batch that can mix with polymer and has no effect on polymer's properties.