CHAPTER IV

CONCLUSION

From the proceeding results and discussion, the main focus of this research is to search for the optimum conditions for the rearrangement of epoxide by iron salts and complexes. The study was carried out in the homogeneous catalytic system at room temperature. $Fe(acac)_3$ was disclosed to be the most effective reagent in this developed method. Styrene oxide 1 mmol as a substrate, $Fe(acac)_3$ 1 mmol as a reagent, a mixed solvent of EtOAc and hexane (1:1) 5 mL as a solvent at 70 °C for 30 min was discovered to be the optimum condition. The highest yield, 90% of the corresponding acetophenone was attained.

The rearrangement study was also applied to other of epoxides. Applications on the rearrangement of cyclohexene oxide, 1-dodecene oxide, butyl glycidyl ether, *tert*-butyl glycidyl ether, the reaction was not successful. Nevertheless, the rearrangement of aryl-substituted epoxide such as styrene oxide derivatives, *trans*-stilbene oxide, 1,1-diphenylethylene oxide and anethole oxide was fruitfully achieved and gave the desired products in moderate to high yield with excellent selectivity.

In terms of kinetics study, the results displayed that the half-life for the rearrangement of styrene oxide under this system was approximately 7 min in THF. The mechanism of the rearrangement of epoxides was confirmed to occur *via* carbocation and H-migration pathway.

Propose for the future work

This research concerned with the methodology development for the rearrangement of epoxides by iron salts and complexes. The outcome opened many possibilities to deal with future exploration. As discussed earlier, $Fe(acac)_3$ has never been utilized in organic transformation, therefore the variation of ligand may provide other intriguing results in terms of product yield and selectivity. The exploration of other metal complexes for the manipulation of the rearrangement of organic compound containing various groups should be another interesting point. The catalytic and stereoselective system is still required. This present examination is a

profitable example for the rearrangement methodology in crucial chemical reaction nowadays, and may be the one of valuable chemical processes in the near future.