CHAPTER IV

CONCLUSIONS

During the course of this research, the developed oxidation system for benzylic methylene compounds was accomplished. The disclosure of chromium (III) stearate as a catalyst coupled with TBHP as an oxidant to become effective catalytic oxidation system was stemmed from the accumulated information from the catalytic screening tests. Various factors: ligand, type of substrate, substituent, oxidizing agent, solvent system, reaction time, reaction temperature affecting on the yield and selectivity of the reaction were cautiously considered. Under the optimized conditions, ethylbenzene, for example could be transformed to the sole product as acetophenone in high yield (95%) with only trace amount of 1-phenylethanol detected. From kinetic study, the half-life of ethylbenzene oxidation was approximately 5 hours at 70°C under air atmosphere. The exploitation of these systems for benzylic oxidation of other substrates was carried out. The corresponding carbonyl compounds were received in accommodation yield under this expedient. The most three striking examples could be noticed from the synthesis of 2,3-dihydro-1H-quinolin-4-one which was rarely obtained from a commercially available 1,2,3,4-tetrahydroquinoline. The second one involved the new approach to prepare keto acid and keto esters. Ethyl oxophenylacetate was a specific example in this study. In addition, the synthesis of unsymmetrical anhydride could also be achieved from this methodology.

Suggestion for the future work

The scale-up experiment is the urgent need to conduct for this project. This developed system could certainly be used as an alternative to prepare some fine chemicals since the operation was very simple and inexpensive. The variety of substrates are still required for further exploration to observe the scope of this reaction. From the academic point of view, stereoselectivity, regioselectivity and chemoselectivity of this developed

system are crucial to investigate. The seletive oxidation reaction was always still called for the discovery. Concerning the use of hazardous chromium complexes, the further study involving chromium supported catalysts on silica gel and alumina should be studied. Alternatively, other transition metal complexes could be rectify in these systems.