CHAPTER 4

CONCLUSION

Epoxidation of styrene by mCPBA is a protonation – promoted pathway. The reaction involves nucleophelic attack of the π – electrons of the double bond at the terminal electrophelic oxygen atom of the hydroperoxide group where the proton is transferred intramolecularly to the oxygen atom of carbonyl group.

Although meta-chloroperbenzoic acids react directly with styrene to provide the corresponding epoxides, it is hard to complete the styrene epoxidation. The protonation on the carbonyl group in mCPBA is the key step in the epoxidation catalysis, making the epoxidation easily initiated and completed.

2-(hydroxylmethyl)anthraquinone has the distal side chain benzylic alcohol that can oxidize to the aldehyde. This process is a deprotonation of the benzylic proton and the other functional group proton to the carbonyl of mCPBA. Because it was the best proton donor. It has higher catalytic efficiency than the other quinone compounds. Because the percent conversion of styrene and the percent yield of styrene oxide was the same value. This shows that styrene not change to undesirable products. Not only 2-(hydroxylmethyl)anthraquinone is the good proton donor but also it is the good proton acceptor.

Although 1, 8-dihydroxyanthraquinone has higher acid dissociation than other dihydroxyanthraquinone because the conjugated base anion is very stable; it has less catalytic efficiency than 2-(hydroxylmethyl)anthraquinone at the same concentration. Because it has two protons per catalytic cycle that gave to oxidant but 2-(hydroxylmethyl)anthraquinone has four protons per catalytic cycle that used for styrene epoxidation catalysis.

Silver nitrate is the inhibitor for this reaction. It decreased the activity of styrene that was the adventage for some quinone catalyst such as 1, 8-dihydroxyanthraquinone. The concentration of styrene oxide was decreased

when added silver nitrate in the solution because the reactivity of styrene was decreased by silver ion.