CHAPTER V

CONCLUSION AND SUGGESTION FOR FURTURE WORK

5.1 Conclusion

The work described in this thesis can be summerized as follows :

1. The epoxide **7** was prepared using the reaction of allyl alcohol and epichlorohydrin to give the chlorohydrin **6.** Cyclization of **6** yielded the epoxide **7.**

2. The unsaturated 2°-alcohols were synthesized by the reaction of epoxide 7 and the nucleophile **8, 10,** and **53** to give the normal products **9**, **55**, and **54**, respectively. All the 2°-alcohol products may be the mixture of stereoisomers, which cannot be separated by TLC or column chromatography. However, this will not have effect when the products **9**, **55, 54** are used in making crosslinked polyurethane.

5.2 Suggestion for Future Work

In this work, the new hydroxy crosslinking agents were synthesized. Their yields are still not good enough for the industrial application and should be improved.

The synthesized chlorohydrin (6) : In this experiment Al_2O_3 was used for promoting the reaction, the yields varied with the amount of alumina. The amount of alumina can be increased beyond 55% to obtain higher yield. The spots of starting material was not observed on TLC plates, therefore the reaction progress was not observed clearly and GC should be used to monitor the progress of raction.

The synthesized epoxide (7) : In this work, only the ratio of solvet mixture was studied. The other conditions such as concentration, temperature, and reaction time could be further studied to improve the yield.

The synthesized hydroxy compounds (9 and 54) : The compounds **8** and **53** are two nucleophiles that have the same reactive groups, therefore they react with epoxide **7 in** the same manner. But **53** was less reactive than **8**, consequently product **9** was obtained in higher yield than **54.** In this step the reaction was carried out in one ratio of solvent mixture. The reaction conditions such as the ratio of solvent, time, and temperature could be studied further.

The synthesized hydroxy compounds, 55 : Expected product for this step was compound **11** but only product **55** was obtained. The reaction conditions have to be studied in more details.

The future work is to make crosslinked polyurethane using this synthetic crosslinking agents. The conditions such as temperature, time, and ratio of crosslinking agents to other ingredients (isocyanate prepolymer, polyol, and additives) can be studied. The properties of polyurethane products could be compared to those obtained from using the common crosslinking agents such as butane diol, 1,4-di(2-hydroxyethyl) hydroquinone, and bisphenol A. If the properties of polyurethane prepared from these synthetic crosslinking agents are better, the structure of the crosslinking agents can be further modified.