CHAPTER III
CONCLUSIONS AND RECOMMENDATIONS

The results indicated that with ZSM-5 as a catalyst, a high acidity catalyst gave better performance than a lower acidity catalyst for the cyclohexene hydration in the batch reactor system. A chromatographic reactor, using the same conditions as in a batch reactor (120 °C), overcame the thermodynamic limitation with water as a continuous reactant and cyclohexene as an injected reactant. However, the concentration of the cyclohexanol in the system was so low and the majority of cyclohexanol was soluble in the aqueous phase that was difficult to be separated by distillation.

Nevertheless, the chromatographic reactor system, using cyclohexene as a continuous reactant and water as an injected reactant, overcame the thermodynamic limitation of the cyclohexene hydration and gave higher concentration of cyclohexanol at the temperature higher than 130 °C. Because the produced cyclohexanol was easily desorbed from the pore of catalyst at high temperature and that reduce the limitation of the desorption step in a chromatographic system. Moreover, the system also gave the majority of cyclohexanol in the oil phase that is easy for further separation. The selectivity of cyclohexanol of all systems at every condition, performed in this work, was nearly 100 %.

A better desorbent than cyclohexene is needed for higher cyclohexanol concentration.