

CHAPTER 7

CONCLUSION AND RECOMMENDATION

The conclusions of the study are the followings:

1. The optimum conditions for hydrogenation of castor oil by using the best commercial catalyst G53D were 140°C , H_2 pressure 175 psig, concentration of catalyst in oil 0.2% Ni/oil, agitation 800rpm, and hydrogenation period 2 hours.

2. The best in-house catalyst was impregnated 9.3% nickel catalyst in particle size range 325-400 mesh.

The catalysts were not completely characterized in this study due to the limitation of time and lack of instrument especially BET apparatus (to determine the total surface area and active surface area of catalysts) which was under development. Thus, further study to complete the research would be worthwhile. The suggested projects are the followings:

1. Characterize the catalysts to correlate catalyst behavior with physical and chemical structure. The method of characterization include determination of total surface area by the BET apparatus, void fraction, pore-size distribution, and in some cases specific metal area by selective chemisorption. Crystallite size may be determined by x-ray line broadening or by direct observation in electron microscopy.

2. To improve the impregnated nickel catalyst, the particle of the support should be grounded into particle size less than 3 μm .

3. To improve the hydrogenation process, the kinetics of the reaction should be studied by using ethyl alcohol as solvent to protect hydroxyl group. The use of solvent during hydrogenation of castor oil also reduces temperature, pressure and reaction period.

4. Prepare the active nickel catalyst by other methods such as precipitation and electroprecipitation.