SUMMARY
Utilizing of Hydrothermal (subcritical water) and Ultrasonic Technology to produce Syn Gas and Alcohol from Glycerol as renewable alternative energy

Reaction of organic compound at sub- and supercritical water or ultrasonic method to a useful matter have been done. In this experiment, glycerol is degraded by water. The aims of this research are to study products of both methods and to obtain the effect of reaction temperature, reaction time and water – glycerol mass ratio to product composition (weight percent). Reaction performed under constant pressure at 250 atm using pressurized gas, nitrogen. Glycerol solution was reacted in batch reactor at temperature range 200 - 400°C, at reaction time range 10 - 60 minutes. When reaction time was reached, reactor is immersed in water cooler fast to stop the reaction. Product would be analyzed using GC-FID dan TCD. The main products in this research are ethanol, methanol and 2-propanol. Ethanol production reaches composition of 100% at 300°C for 10 minutes at glycerol water mass ratio 1 : 8 and maximum point for glycerol water mass ratio 1 : 9. Whereas the main products of ultrasonic method are 2-propanol and n-propanol. Production of 2-propanol at glycerol – water mass ratio 1 : 9, it reaches maximum point about 21.31% at 1 atm, at 60°C for 10 minutes and about 12.57% at 200 atm, at 40°C for 40 minutes.

Keyword : glycerol hydrothermal, subcritical water, supercritical water, ultrasonic, sonochemistry