GLYCEROL DEGRADATION BY USING MICROWAVE

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ABSTRACT

Alternative energy sources are needed as the increasing use of petroleum. One of the possible energy sources to be developed is biodiesel. Making biodiesel on a large scale would cause the side of a large amount of glycerol as well. Hence, it need an efforts to increase the added value of glycerol that can also produce other products that are more needed today. One of them is by degradating glycerol that can produce alternative fuels. The purpose of this research is to study the effect of microwave (power, time) on the glycerol degradation with the concentration of acetaldehyde formed and number converted glycerol as a parameters. And also comparing two types of catalysts towards the glycerol degradation with the concentration of acetaldehyde formed and number converted glycerol as a parameter.

This research started by preparing a glycerol solution and water, with the mass ratio 2 : 3. Then put catalyst in accordance to variable into the glass reactor. Hetaing the heater until the temperature reach 250 °C. Next, flow the glycerol solution at the constant rate by opening the valve. Then, turn on the microwave by setting
the power and time accordance with the variable. Then, take a sample at the end of each run on the water trap glass. Last, analyze the liquid product formed by using GC method.

From the results, we conclude that the concentration of acetaldehyde product tends to increase along with increasing power and time. The biggest concentration of acetaldehyde obtained at 8 minutes with a power of 600 watts. In addition, converted glycerol tended to increase along with increasing power. The best conversion obtained at 600 watts 12 minutes which is 85%. The comparison of the effectiveness for 2 types catalyst (activated carbon is acidified with phosphoric acid and phospotungstic acid) indicate that the use of phospotungstic acid on the catalyst can produce higher temperatures when compared with the use of phosphoric acid. This temperature affect the concentration of acetaldehyde produced. Carbon that has been acidified with phospotungstic acid generating a higher conversion when compared with carbon catalyst that has been acidified with phosphoric acid. The highest conversion of glycerol obtained in the use of phospotungstik acid catalyst. At 600 watts and 6 minutes 91.68% glycerol is converted.

Keywords : Degradation, Glycerol, Microwave, Catalyst