SUMMARY

Bioethanol is an alternative energy, but bioethanol have high fuel grade concentration (99% absolute). The production of ethanol need expense about 50 % from the total production cost. Bioethanol has a lower volumetric heating value and a lower Reid vapor pressure (RVP) than gasoline. This paper focuses on the third disadvantage. A lower RVP makes cold-start ignition and operation of a spark ignition (SI) engine difficult at low ambient temperatures. Bioethanol can used as raw material in DiEthyl Ether production, while as an alternative energy. The DiEthyl Ether production process commonly use hydration process by sulfuric acid as catalyst. The catalyst need separation and purification after used. The sulfuric acid is corrosive material then cause a high investment in equipment. In this research will develop DiEthyl Ether production by using heterogen catalyst with natural zeolite as raw material. Indonesia have deposits of zeolite very high, like as in Lampung district, Tasikmalaya residence, Malang and Gunung Kidul.

In second year, The objective of this research is synthesis of zeolite catalyst for ethanol dehydration process. The first step is study of synthesis methods in H-zeolite catalyst. The variables are zeolite diameter, dealumination time, type of solvent, concentration of HCl and ration of weight zeolite and solvent must be studied in this experiment. The response in this research are characteristic of catal on like as surface area, pore diameter, volume of pore and ration Si/Al so crystallity by XRD (X-ray Diffraction). The zeolite catalyst then used for catalytic test in DiEthyl Ether production.

The results of this research indicate that the concentration of HCl influence of the solids converts and the concentration used in process is 2.5-6 M. The variable having an effect on to characteristic and activity of catalyst is type of solvent concentration HCL, time dealumination and ratio weight of natural zeolite with volume HCL, while temperature dealuminasi do not its significant influence. The results of XRD analysis of H-zeolite catalyst is not influenced by time dealumination. The H-zeolit catalyst that synthetized with dealumination time 10 hours have highest the specific surface area and total volume of pore 184.52 m²/ gram and volume totsl of pore 108,243 x 10⁻³ cc/gram. H-Zeolite catalyst product can used as catalyst in dehydration of ethanol. H-Zeolit catalyst that have activity for ethanol dehydration, alternately from biggest value yield of DiEthyl Ether are hydrochloride acid, ammonium of chloride and Na EDTA. The ZCBB catalyst (the catalyst that synthezed by using ammonium chloride 1M) has small specific surface are, but obtained yield of DiEthyl Ether big enough. The H-zeolite catalyst type KZ A representing of silicalite type and KZ B representing mordenite type. The result of ethanol dehydration indicate that the catalyst alumina, KZ A and KZ B applicable to produce DEE, and catalyst HZSM-5 can not used as catalyst in ethanol dehydration. The type of catalyst for ethanol dehydration obtained yield of DEE is alumina and KZ.

Key words: H-zeolite catalyst, ethanol dehydration process, area surface, ratio of Si/Al, ethanol conversion and yield of DiEthyl Ether