

## Development of heterogeneous Alumina supported base catalysts for biodiesel production

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Double promoted  $\gamma$ -alumina heterogeneous base catalyst (CaO/KI/ $\gamma$ -alumina) was firstly developed for the production of biodiesel from palm oil in refluxed methanol. This study have conducted in order to improve the activity of single promoted catalyst (CaO/ $\gamma$ -alumina) and to enhance the efficiency of biodiesel production that have been done in the previous work. The CaO/KI/ $\gamma$ -alumina catalyst was prepared by precipitation and impregnation methods. Engineering catalyst done with some parameters that effect on the activity of a catalyst among other: % CaO loading (w % against alumina), temperature and time of calcination. The catalyst was characterized by mean of XRD, BET and SEM methods. The activity of catalyst has been tested by introduced to the transesterification reaction of palm oil. The reaction was carried out in the batch type of reactor (three-neck glass flask with 500 ml capacity) equipped with reflux condenser, thermometer and magnetic stirrer. The result showed that the optimum condition of preparation catalyst (% of CaO loading, temperature and time of calcinations) were 30%, 650°C and 4.5 h, respectively. Under the optimum condition of catalyst, reaction temperature 65°C, reaction time 5h and oil to methanol molar ratio of 1:46 the conversion of palm oil was almost 97%. Therefore, it can be proved that the activity of doble promoted catalyst (CaO/KI/ $\gamma$ -alumina) much higher than that the single promoted (CaO/ $\gamma$ -alumina) one.

### Biography

Nyoman Puspa Asri is a doctorate student in Chemical Engineering from Sepuluh Nopember Institute of Technology (ITS), East Java, Indonesia. Right now I'm in the third year. I've been present as a speaker in several international seminar with the main topic , renewable energy , especially the manufacture of biodiesel with a heterogeneous catalyst. A few titles of paper which has been presented among others: Biodiesel Production from Palm Oil using CaO/Al<sub>2</sub>O<sub>3</sub> as a Solid Base Catalyst (ISFACE, Kuta, Bali, (2010), Biofuel production from palm oil by hydrocracking with Ni-Mo catalyst (SRKP, Diponegoro University, Semarang, Midle of Java, 2011), Transesterification of palm oil to methyl ester using  $\gamma$ -alumina supported base catalyst (BISTECH, Denpasar, Bali, 2011), Synthesis of methyl ester from palm oil with  $\gamma$ -alumina heterogeneous catalyst (SRKP, Diponegoro University, Semarang, Midle of Java, 2011)

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