Biodiesel from Used Cooking Oil Using Heterogeneous Catalysts From Egg Shells Through Water Washing Method

Dafit Ari Prasetyo S.T., M.T *as Thesis Adviser*

Dea Alifiana

Study Program of Renewable Energy Engineering

Department of Engineering

ABSTRACT

Biodiesel is a fuel made from vegetable oil and animal fat that is environmentally friendly. Used cooking oil is one of the vegetable ingredients that can be used as a biodiesel raw material. This research uses used cooking oil as the main raw material for biodiesel. Used cooking oil which has high free fatty acids. So it is necessary to reduce the levels of free fatty acids contained in used cooking oil. The catalyst that used in this research was heterogeneous catalyst, the purpose of CaO which has been obtained from the calcination process of chicken eggshell. This reseach is the effect of CaO catalyst and stirring time to the transesterification reaction, to analyze and analyzing the characteristics of biodiesel according to the quality of biodiesel standart of SNI 7182:2015. This study used CRD (Completely Randomized Design) with 2 factorials and 3 levels of CaO catalyst concentration (3%, 6% and 9%) and stirring time (1 hour, 2 hours and 3 hours). Purification of biodiesel is carried out using the water washing method by distilled water and the evaporation process to remove the remaining water in the biodiesel. The highest yield of biodiesel in A1B1 (3% of catalyst and 1 hour of stirring) produced was 77.405% and the quality of biodiesel 886 Kg/m3 of density, 18%-mass of iodine number, 15.175 cSt of viscosity, 7.289% of acid number, 18.6%-mass of cetane number and 40.316% of methyl ester content. .

Keywords: Biodiesel, Eggshell, Transesterification, Used Cooking Oil.