Abstract

Energy crisis especially in crude oil decreases production were take an effort to had a research find another recources in alternative fuel that can be developed in the future. The purpose of this experiment is to find out properties and performance of constant speed diesel engine using straight vegetable oil as fuel and diesel fuel as a control.

The research is using straight vegetable oil fuel from soybean, corn, canola and sunflower, as a control factor using diesel fuel. The experiment will take place in Combustion Technics and Fuel Laboratory of Mechanical Engineering Department ITS using diesel Shogun L40AE-S 3.1kW/3600 rpm. The beginning of this experiment, we take data properties from each fuel to known that if fuels are same with standar or not. After that, experiment of performance is taken at constant speed (±3600 rpm), data was taken at 100 Watt to 1500 Watt with interval 100 Watt.

The result of this experiment shown that, using many kind vegetable oil as fuel from soybean, corn, canola and sunflower compare with diesel fuel decrease power, torque, and bmep in average into 6.87%, 7.64%, 10.09% and 11.59%. Sfc values are increase in average into 35.41%, 40.79%, 42.18%, and 46.72%. Thermal efficiency values are decrease in average into 30.08%, 30.91%, 31.10% and 31.67%. For exhaust emission that represent opacity are decrease in average into 28.66%, 35.76%, 44.31%, and 48.92%.

Keywords: alternative fuel, vegetable oil, diesel, performance, emission