Characteristics Test of Used Cooking Oil Using CaO Catalyst From Cow Bones

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ABSTRACT

Fuel comes from fossil fuels such as petroleum, natural gas and coal. These fossil fuels are called non-renewable energy sources, fossil fuels cannot be used for a long time. One alternative fuel is biodiesel, the raw material for biodiesel is made from vegetable oils and animal oils such as palm oil, coconut oil, castor seed oil, kapok seed oil, and fish oil, researchers used used cooking oil as the raw material. Used cooking oil is frying waste from cooking oil that has been used repeatedly. Used cooking oil contains free fatty acids. Therefore, a catalyst is needed. The catalyst functions to reduce the activation energy of the reaction so that the reaction takes place more quickly. The catalyst used is the heterogeneous base CaO from beef bones. CaO is a heterogeneous catalyst that has many advantages, including being reuseable, safe waste disposal, raw materials that are easy to obtain at an economical cost and abundant in nature. Beef bones have a fairly high calcium content, namely around 85.84%. Control variables in this study were calcination temperature (900°C), calcination time (4 hours), transesterification reaction temperature (65°C), stirring speed (300 rpm), transesterification reaction time (3 hours), methanol volume (40 mL), phosphoric acid (1 mL), Catalyst concentration (0.2 g). Three tests for biodiesel from bovine and commercial bones are viscosity density and cetane number. The average test results of cattle bone CaO produced a density of 0.874 g/ml, a viscosity of 52.36 mm^2/s, a cetane number of 74.2. in tests using Commercial CaO it produces a density of 0.875 g/ml, a viscosity of 60.11 mm^2/s, a cetane number of 74.4.

Key words: Biodiesel, used cooking oil, beef bone CaO and commercial CaO