

***Decrease in FFA Content of Used Cooking Oil Using Cocoa Bean Shell
(Theobroma Cacao L.) as Activated Charcoal Adsorbents in Biodiesel***

Production

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ABSTRACT

Used cooking oil is dark brown in color and smells rotten. Used cooking oil waste can be used as biodiesel because it is high in triglycerides and saturated fatty acids (FFA). It is necessary to drop the FFA concentration of used cooking oil to under 2% before transesterification. cocoa bean shell charcoal (Theobroma cacao l.) is used as an adsorbent in an adsorption process to lower FFA levels. The purpose of this study is to ascertain how differences in concentration of HCl in activating the charcoal and the temperature rise in FFA reduction process, in affect the reduction of FFA levels. This study used a two-factorial Completely Randomized Design (CRD) with three levels of HCl activator concentration (6, 8, and 10M) and temperature treatment (75°, 100°, and 150°C) to lower the FFA content in used cooking oil. The SNI 7182-2015 biodiesel standard is the basis for the parameters used to test biodiesel yields. The best A3T2 variant, which produced a biodiesel yield value of up to 75%, was found to be able to lower FFA levels by 80% (10 M, 100°C). Density of 867 kg/m³, acid of 0,5 mg KOH/gam, viscosity of 1,52 cSt, cetane of 43.835, iodine of 11.8%-mass, heating value of 48.081Mj/kg, and methyl ester content of 143, 9854715%-mass.

Keywords: *Adsorbent Activated Charcoal, Biodiesel, FFA Levels, Used Cooking Oil.*