

***Application Of Activated Charcoal Cigarette Filters In The Process Of Refining Biodiesel  
From Kesambi Oil***

Dr. Yuana Susmiati, S.TP., M.Si (*Undergraduate Thesis Supervisor*)

**Mesbahul Syarif**  
***Study Program of Renewable Energy Engineering***  
***Majoring of Engineering***

**ABSTRACT**

*Cigarette production continues to increase every year, causing B3 waste in society. Cigarette filters are made from cellulose which has a nicotine content of 17 mg/stick and a tar content of 24-45 mg/stick which is capable of killing living creatures in water and polluting the environment. Cigarette filters that have been subjected to a chemical burning and activation process can be used as adsorbents in the biodiesel refining process. The aim of this research is to analyze the concentration of active charcoal in cigarette filters that can produce the most optimal yield of pure biodiesel using the response surface methodology (RSM) and to compare its quality with the SNI 7182:2015 standard. The RSM analysis used is 1 factor and 1 response. These factors are adsorbent variations of 5-10% m/v and the response is biodiesel yield. The highest yield resulting from this research was 73.33% at an adsorbent concentration of 5% m/v. Adsorbent and biodiesel yield are inversely proportional to each other, where the lower the addition of adsorbent, the higher the yield of biodiesel produced. The biodiesel quality includes a flash point of 178°C, kinematic viscosity of 31.59 mm<sup>2</sup>/s cSt, calorific value of 2,366 Kcal/kg, octane number less than 50, density of 0.906°C, acid value of 2.44 mg KOH/g, iodine value of 54 g-I<sub>2</sub>/100 g, cloud point of 6°C, saponification value of 198 mg KOH/g, CCR of 0.44% mass, and FAME content of 7.28% mass.*

***Keywords:*** Adsorbent, Biodiesel, Cigarette Filter, Kesambi Oil, RSM