

**Perbaikan Mutu Biodiesel Minyak Jelantah Menggunakan *Activated Mixture Adsorbent* dengan Metode *Dry-wash Purification* (Quality Improvement of Used Cooking Oil Biodiesel by *Activated Mixture Adsorbent with The Dry-wash Purification Method*) Supervised by: Meilana Siswanto ST., M.Sc (as chief counselor) dan Risse Entikaria Rachmanita S.Pd, M.Si (as a member counselor)**

**Muhammad Yudistira Taslim**  
*Study Program of Renewable Energy Engineering*  
*Department of Engineering*  
Program Studi Teknik Energi Terbarukan  
Jurusian Teknik

## **ABSTRACT**

*Entering the industry 4.0 era make energy and fuel as one of the most essential needs. Biodiesel is one of alternative fuel derived from vegetable oil or animal fats, is sustainable, renewable, and environmentally friendly. Used cooking oil is a potential waste to be developed into biodiesel. In spite of that, it has a high FFA value due to repeated use at high temperatures make the oil oxidized and hydrolyzed, therefore FFA have to reduced before entering the transesterification process. The reduction of FFA is conducted by adsorption method using activated mixture adsorbent, which is a mixture of two types of activated adsorbents. Activated mixture adsorbent is also used in the dry washing process of raw biodiesel to increase the purity level of product. This research uses a Completely Randomized Design (CRD) with two factors, first is variations of the mass of adsorbent (M) (3%, 6%, and 9%) and the second is variations in the ratio of adsorbent mixtures (A) (30:70, 50:50, and 70:30). Then biodiesel characterization parameters such as density, viscosity, acid number, iodine number, yield, cetane number, methyl ester content, and heat value observed and compared to SNI 7182 - 2015. The results showed that the best sample was M3A3 (9%, 70: 30) with the following characterization results: density 850 kg / m<sup>3</sup>, viscosity 4.16 cSt, acid number 0.25 mgNaOH/gr, iodine number 9.28 gr / 100gr, yield of 63.01%, cetane numbers 44,38, the heating value is 47,97 MJ/Kg, and methyl ester content is 98,62%.*

**Keywords:** *Activated Mixture Adsorbent, Biodiesel, Used Cooking Oil, Dry-wash*