

**Penggunaan Zeolit Alam Pada Pra Transesterifikasi Dan Dry Washing Dalam Pembuatan Biodiesel Dari Minyak Jelantah** (*The Use of Natural Zeolites in Pre-Transesterification and Dry Washing in the Making of Biodiesel from Used Cooking Oil*)

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**ABSTRACT**

*Biodiesel is an alternative fuel to substitute diesel made from vegetable oils or animal fats. The making of biodiesel in this research uses used cooking oil as the main raw material and the use of zeolite as an adsorbent to reduce the levels of free fatty acids contained in used cooking oil, where the zeolite used is first activated using HCl to be free from impurities. This research was designed using 2 factorial completely randomized design (RAL), namely the first factor activator concentration of HCl (A) 10M, 11M, 12M and the second factor is the mass concentration of zeolites namely (K) 9%, 12% and 18%. The biodiesel parameters analyzed included density (acid), acid number, cetane number, Fatty Acids Methyl Esther (FAME), heating value, cetane number, density, (Free Fatty Acid, FFA), viscosity, and acid number, yield. The results showed that the highest yield was 90% and the lowest FFA content was 0.384 in the treatment of 12M HCl concentration and 12% zeolite mass concentration, with biodiesel quality including: density 851. Kg / m<sup>3</sup>, acid number 0.43 mg-KOH / g, cetane number 49.131, iodine number 11.56 gr / 100gr, viscosity 4.88 mm<sup>2</sup> / s, methyl ester content 91.43 and 48.28 MJ / Kg.*

**Keywords:** *biodiesel, zeolite, decreased levels of FFA*