

## **COMPARISON OF THE PROPERTIES OF PALM OIL AND PALM KERNELOIL BODIESEL IN RELATION TO THE DEGREE OF UNSATURATION OF THEIR OIL FEEDSTOCKS**

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### **ABSTRACT**

The correlation between biodiesel properties and their degree of unsaturation was investigated. The feed stocks considered were crude palm kernel oil and Palm oil. Crude PKO was extracted from palm kernel seeds using traditional method of extraction. Biodiesel was produced from the crude PKO using base-catalyzed trans-esterification process. Two factors were varied during the production process: methanol-oil ratio and reaction time (minutes). Thirteen experimental runs were carried out and a maximum yield of 87% was obtained at a reaction time of 65 minutes and a methanol-oil ratio of 6.0. The process was optimized using the response optimizer of MINITAB 16 and an optimum yield of 88% was obtained at a reaction time of 58 minutes and a methanol-oil ratio of 7.8. The properties of the biodiesel obtained from crude PKO were also compared with the properties of palm oil biodiesel obtained from literature. The degree of unsaturation of palm kernel oil and palm oil were calculated from the fatty acid composition of both oils. The biodiesel properties were correlated with the degree of unsaturation. Biodiesel produced meets standard specifications (ASTM, EN).

**KEYWORDS:** Biodiesel, Fatty Acid, Palm Kernel Oil, Palm Oil, Trans-Esterification