

ABSTRACT

Sawdust has the ability as an adsorbent because it contains cellulose to remove impurities in used lubricating oil that has been contaminated with wear metal particulates. Sawdust was modified with triethanolamine bromide, triethanolamine, lithium bromide, sodium carbonate, and aquades that can improve the properties of wood and increase its adsorption capacity by testing using Fourier Transform Infra-Red Spectroscopy (FT-IR). Where the FT-IR test results obtained changes in the absorption increase in the FT-IR spectrum of sawdust modified for 20 hours showed better adsorbent than the modification of 15 hours and 25 hours. Modification of 20 hours gained an increase in hydroxyl groups, decreased carboxyl groups and peak C-N adsorbance at 1263.58 cm^{-1} which showed indirect modification of sawdust experienced success to adsorption of wear metal. Based on the results of FT-IR sawdust test, filtration of used lubricating is then carried out. The result of the modified sawdust filtration process experienced a decrease in viscosity of 13.26% at $40\text{ }^{\circ}\text{C}$ and at a temperature of $80\text{ }^{\circ}\text{C}$ 8.29% and closer to the viscosity value of the new lubricating oil compared to viscosity after filtering with ordinary sawdust. From the results of the researchers it can be seen that modified wood powder can reduce aluminum metal content (Al) 71.86% while using ordinary sawdust reduces aluminum metal (Al) 9.73%. Which proves the effect of modification on sawdust can reduce absorption of metal particulates better.

keyword: Lubricating, engine, wear metal, sawdust, modified, filtration, FT-IR, viscosity.