

ABSTRACT

THE COMPARATION OF APPLICATION OF COAL FLY ASH WITH PHYSICAL AND NaOH-PHYSICAL ACTIVATION WITH NORMALITY VARIATION ON PERFORMANCE OF A 4-STROKE DIESEL ENGINE

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Oxygen is the most important gas needed in the combustion process. Higher level of oxygen in the air, the combustion process would be more optimal. Fly ash is an alumina silicate compound which was physically and chemically has ability as an adsorbent.

In this study, the ability of fly ash as an adsorbent was used to filter the air during the combustion process in order to increase performance of a 4-stroke diesel engine. Fly ash was given two activation processes those were physical and chemical-physical activation using NaOH with 0,25N; 0,50N; and 0,75N normality and physical activation at temperature of 150°C for 1 hour and mass variation of 25 grams, 50 grams and 75 grams. The activation was aimed to clean the surface of the pores and through compound impurities in fly ash. As the air had been filtered, the fly ash would be rich in oxygen and made the combustion process of a 4-stroke diesel engine better than before, resulting in increase performance of engine.

From the test results and analysis had been known that using chemical-physical and physical activation fly ash can increase the performance of diesel engine. The results show that the highest increase of brake power in average occurred in using fly ash pellet of NaOH-physical activation with normality 0,50N and 75 grams of mass that is 2.2446%, followed with NaOH-physical 0,25N and mass of 75 grams that is 1,8991 %. The best reduction of specific fuel consumption on application of fly ash pellet were physical activation with 50 grams of mass giving an increase of 4.4404%. How are then the best reduction of specific fuel consumption in average occurred in using fly ash pellet of NaOH-physical activation with normality 0,75N giving an increase of 3,7425 %, and as big as 3,5893 % for NaOH-physical activation with normality 0,50N, while for physical activation, it was of 2,9275 %.

Keywords: NaOH-physical activation, fly ash adsorbent, diesel engine, brake power.