ABSTRACT

THE EFFECT OF VARIATIONS IN COMPOSITION, TYPE OF WATER, AND ACTIVATION CONDITIONS OF COAL FLY ASH ADSORBENT ON ENGINE PERFORMANCE AND EXHAUST GAS EMISSIONS OF 4-STROKE CARBURETOR ENGINE

by

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The development of technology has made human being to develop any kinds of machine while it is still using fossil fuels, on the other hand, the supply of fuel is decrease by year. So researcher do a research on the use of fly ash pellets with some variations for fuel economy and reduce exhaust emissions. This study is aimed to determine the effect of variations in composition, type of water, and activation conditions on engine performance and exhaust gas emissions of 4-stroke carburator engine.

This research was done with some tests. It was with and without the use of fly ash pellets. The Tests conducted were road test, acceleration, stationary and emission testing. Road Test conducted with a constant velocity of 50 km/h for 5.7 km and testing the acceleration test from 0 km/h until 80 km/h (with gearshift). Tests performed on stationary were in 1000, 3000 and 5000 rpm while the emissions test were done at 1000 and 3000 rpm. It used 10 mm diameter and 3 mm thick pellet. Fly Ash pellets packed in a frame and put on the air filter. So before the air into the vehicle, it wil be firsting contacted with the pelletized fly ash.

In this study, the best composition mixture is the A_{32} (32 ml of water, 4 grams of starch and 71 grams of Fly Ash) and the most efficient types of water used is $H_{12}Z_{20}$ and the best conditions was on the temperature 150^{o}C and activation time of 1 hour with fuel savings in road test reached 12.69%, and fuel economy at a stationary test up to 22.65% and the reduction of travel time (0-80 km / h) of 6.86%. Fly Ash pellets were able to reduce the levels of CO by 76,92 %, 19,57 % for HC levels and raise their levels of CO_2 by 4,36 % .

Keywords : Rice husk fly ash, pelletized fly ash adsorbent, exhaust gas emissions, engine performance