ABSTRACT

THE EFFECT OF VARIATION OF COMPOSITION, TYPE OF WATER, ACTIVATION CONDITIONS, AND MAKING CHARCOAL ADSORBENT ON ENGINE PERFORMANCE AND EXHAUST GAS EMISSIONS OF 4-STROKE CARBURETOR MOTORCYCLE

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The fuel crysis is one of problems faced by the world and Indonesia today. To reduce vehicles fuel consumption, it can be done by utilizing the abundant natural resources especially in the province of Lampung by using charcoal from rice husk pellets . This study aimed to examine the influence of variations in composition, type of water, the activation conditions, and type of husk charcoal making, on engine performance and exhaust emissions of 4- stroke petrol engine.

The research was carried out with several variations of the test. The road test constantly with 50 km/h for 5.7 km, the acceleration test from 0 km/h until 80 km/h (with gearshift), stationary at 1000, 3000 , and 5000 rpm, and the exhaust emissions at 1000 and 3000 rpm by using charcoal pellets and without charcoal pellets. Charcoal pellets used in this study were 10 mm in diameter and a thickness of 3 mm with mass of 32 gram. Charcoal pellets were packed in a frame and placed in the air filter of 110 cc motorcycle. The variation of compositions used in this study was divided into 3. They were A_{18} (18 % water, 11 % *tapioka* and 71 % charcoal), A_{28} (28 % water, 11 % *tapioka* and 61 % charcoal) and A_{38} (38 % water, 11 % *tapioka* and 51 % charcoal). The type of water in the mixture of making pellet was aquades and the best zeolite water immersion results. The variations of activation conditions were at temperature 150^0C and 175^0C and the activation times were 1 hour and 2 hour. The variations of making charcoal adsorbent divided into 2 way, the roasted and the drum kiln burning stirred.

In this study, the best composition mixture in making of charcoal pellet was A_{18} (18 % water, 11 % *tapioka* and 71 % charcoal), the efficient use of water in the mixture of pellet making charcoal is the best zeolite water immersion results ($H_{12}Z_{20}$) with immersion time of 6 hours and 20% of the mass of zeolite water volume, while the best activation conditions is at a temperature of 150^0C and the activation time of 2 hours. The best way of making charcoal is by using stirred

drum kiln burning. The charcoal pellets could save fuel by 15.72% on road test, 18,55% on a stationary test, and increase acceleration by 7.02%. The use of rice husk pellets are also proven to reduce vehicle exhaust emissions because it could reduce levels of CO and HC by 85,71% at 37,45% as well as increasing levels of CO_2 by 6,70%.

Key words :Engine performance, rice hulk charcoal pellets, charcoal adsorbent pellets, exhaust emissions.