ABSTRAK

FABRIKASI KATALIK KONVERTER MODEL SANDWICH DENGAN METODE *SCREEN-PRINTING* UNTUK PENINGKATAN PERFORMA KENDARAAN BERMOTOR

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Tujuan dari penelitian ini adalah pembuatan katalitik konverter berbahan dasar sekam padi untuk meningkatkan performansi kendaraan. Sekam padi memiliki kandungan selulosa dan lignin yang tinggi sehingga baik digunakan sebagai karbon aktif. Keunggulan dari karbon aktif memiliki sifat penyerapan yang baik karena memiliki luas permukaan yang luas dan memiliki pori yang besar setelah diaktivasi. Pembuatan karbon aktif dari sekam padi dilakukan mulai dari pre-karbonisasi, dengan suhu 400°C selama 2 jam setelah itu karbon yang dihasilkan kemudian diaktivasi dan diukur dengan aktivator campuran HCl, H_3PO_4, NaOH dan diendapkan selama 48 jam lalu dilakukan proses karbonisasi dengan *furnice* pada suhu 650°C selama 12 jam. Karakteristik karbon aktif sekam padi akan di uji menggunakan *X-Ray Diffractions* (XRD), *fourires transform infrared* (FTIR), dan *Scaning electron micro – energy dispersive X-Ray spectroscopy (*SEM-EDS). Dilakukan pencetakan dan penambahan lapisan tembaga pada permukaan katalitik konverter dengan metode *screen-printing*. Berdasarkan hasil pengujian didapatkan dengan penambahan katalitik konverter berhasil menurunkan emisi gas buang dan meningkatkan performansi kendaraan. Penurunan emisi gas buang HC didapatkan tanpa katalitik sebesar 674 ppm dan dengan katalitik sebesar 173 ppm, dan emisi CO tanpa katalitik sebesar 2.84 % dengan katalitik sebesar 1,68%. Peningkatan torsi tertinggi sebesar 7,5% pada putaran 6000 rpm dan peningkatan daya sebesar 9% pada putaran 6000 rpm, dan penurunan kebisingan terjadi pada katalitik konverter sebesar 4,7% dalam kondisi mesin idle.

Kata kunci: Karbon aktif, Katalitik konverter, *Screen-printing*, performansi kendaraan bermotor.

ABSTRACK

FABRICATION OF A SANDWICH MODEL CATALYTIC CONVERTER UTILIZING THE SCREEN-PRINTING METHOD FOR THE ENHANCEMENT OF MOTOR VEHICLE PERFORMANCE

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The purpose of this research is to create a catalytic converter from rice husk, with the objective of enhancing the performance of vehicles. Rice husk has been found to contain a high percentage of cellulose and lignin, thus rendering it a suitable material for use as activated carbon. The merits of activated carbon are attributable to its capacity for absorption, which is enhanced by its substantial surface area and large pores, a consequence of the activation process. The process of preparing activated carbon from rice husk commences with pre-carbonisation at a temperature of 400 °C for a duration of two hours. Subsequently, the resulting carbon is activated and measured using an activator mixture comprising HCl, H_3PO_4, NaOH. The activated carbon is then deposited for a period of 48 hours. Thereafter, the carbonisation process is carried out in a furnace at a temperature of 650 °C for a duration of 12 hours. The characteristics of rice husk-derived activated carbon will be investigated through a range of analytical methods, including X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), and scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM-EDS). The process of printing and adding a copper layer to the surface of the catalytic converter was carried out by means of the screen-printing method. A study of the test results revealed that the addition of the catalytic converter led to a reduction in exhaust emissions and an enhancement in vehicle performance. The decrease in HC exhaust emissions obtained without catalytic is 674 ppm, and with catalytic is 173 ppm, and CO emissions without catalytic is 2.84%, with catalytic is 1.68%. The highest recorded increase in torque was 7.5% at 6000 rpm, with a concomitant increase in power of 9% at the same point. In addition, a decrease in noise was observed in the catalytic converter by 4.7% in idle engine conditions.

Keywords: *activated carbon, catalytic converter, -, motor vehicle performance.*