

## ABSTRACT

*One of the factors that causing pollution is the exhaust gas which produced by vehicles. Exhaust gas emissions produced by vehicles, especially gasoline engine is getting higher over time. Therefore, the authors took the initiative to conduct research about gasoline engine exhaust system modification in order to reduce levels of exhaust gas emissions. The research was conducted by adding activated carbon to the gasoline engine exhaust system (muffler). Then the exhaust gas emission testing is carried out before the activated carbon is mounted on muffler and after the activated carbon is mounted on muffler. Each exhaust gas emission testing uses 5 variations of engine speed, namely 1,500 rpm, 2,000 rpm, 3,000 rpm, 4,000 rpm and 5,000 rpm. The parameters measured in the exhaust gas emission testing are CO, CO<sub>2</sub>, HC, and NO<sub>x</sub> levels. After testing the exhaust gas emissions, data obtained showed that the level of exhaust gas emissions is decreased, where the average CO levels decreased by 0.18% vol, the average CO<sub>2</sub> levels decreased by 0.168% vol, the average HC levels decreased by 9.3 ppmv, and the average NO<sub>x</sub> level decreased by 17.2 ppmv. This shows that the addition of activated carbon in the gasoline engine muffler affects the decreasing levels of exhaust gas emissions.*

**Keywords:** *exhaust gas emissions, activated carbon, muffler, gasoline engine*

## INTISARI

Salah satu faktor penyebab polusi adalah gas buang yang dihasilkan oleh kendaraan bermotor. Emisi gas buang yang dihasilkan kendaraan bermotor, khususnya motor bensin semakin tinggi seiring berjalannya waktu. Oleh karena itu, penulis berinisiatif untuk melakukan penelitian mengenai modifikasi sistem pembuangan motor bensin dalam rangka mengurangi kadar emisi gas buang. Penelitian tersebut dilakukan dengan cara menambahkan karbon aktif pada knalpot motor bensin. Kemudian dilakukan pengujian emisi gas buang sebelum knalpot di pasang karbon aktif dan sesudah knalpot dipasang karbon aktif. Pengujian emisi gas buang masing-masing menggunakan 5 variasi putaran mesin, yaitu 1.500 rpm, 2.000 rpm, 3.000 rpm, 4.000 rpm, dan 5.000 rpm. Parameter yang di ukur pada pengujian emisi gas buang adalah kadar CO, CO<sub>2</sub>, HC, dan NO<sub>x</sub>. Setelah dilakukan pengujian emisi gas buang, diperoleh data yang menunjukkan penurunan kadar emisi gas buang, yang mana rata-rata kadar CO turun sebesar 0,18 %vol, rata-rata kadar CO<sub>2</sub> turun sebesar 0,168 %vol, rata-rata kadar HC turun sebesar 9,3 ppmv, dan rata-rata kadar NO<sub>x</sub> turun sebesar 17,2 ppmv. Hal tersebut menunjukkan bahwa penambahan karbon aktif pada knalpot motor bensin berpengaruh terhadap menurunnya kadar emisi gas buang.

**Kata kunci:** emisi gas buang, karbon aktif, knalpot, motor bensin