

**PENGARUH PEMBERSIHAN BIOGAS DENGAN LARUTAN NaOH
TERHADAP RPM, TORSI, SUHU GAS BUANG, DAN EMISI
PADA MOTOR BENSIN**

KURNIA ARIF OKTOVIANTO

11/318948/TP/10193

INTISARI

Biogas merupakan sumber energi terbarukan yang bersumber dari biomassa. Dalam biogas terkandung gas CH_4 yang dapat digunakan sebagai bahan bakar motor bensin. Dalam biogas terkandung juga gas-gas lain seperti H_2O , H_2S , dan CO_2 yang merupakan gas pengotor. Presentase gas CO_2 cukup besar yaitu 25% - 45%. Pembersihan gas CO_2 diperlukan untuk meningkatkan efektifitas penggunaan biogas pada motor bensin. Salah satu cara pembersihan gas CO_2 dapat dilakukan dengan metode absorpsi dengan melewati dua zat yang berbeda fase yaitu biogas dan absorben berlawanan arah sehingga terjadi transfer massa. Tujuan penelitian adalah mengetahui pengaruh dari pembersihan biogas menggunakan larutan NaOH terhadap Rpm, torsi, suhu gas buang, dan emisi CO pada motor. Konsentrasi larutan NaOH yang digunakan yaitu 0% (tanpa pembersihan), 10%, 20%, dan 30%. Bukaannya gas motor bensin divariasikan pada bukaan 30%, 70% dan 100%. Hasil penelitian menunjukkan penambahan konsentrasi NaOH meningkatkan Rpm, Torsi, emisi CO pada motor bensin dan menurunkan konsumsi bahan bakar tetapi tidak pada suhu gas buang. Rpm terbesar pada bukaan gas 100% dan variasi NaOH 30% yaitu sebesar 3261 Rpm. Torsi terbesar ditunjukkan pada bukaan gas 100% dan konsentrasi NaOH 10% yaitu sebesar 1,48 Nm. Konsumsi bahan bakar paling hemat adalah pada bukaan gas 30% dan konsentrasi NaOH 30% yaitu sebesar 294,846 liter per 10 menit. Kadar emisi CO terendah ditunjukkan pada variasi bukaan gas 30% dan konsentrasi NaOH 0% sebesar 0,018%. Suhu gas buang terendah ditunjukkan pada variasi bukaan gas 70% dan konsentrasi NaOH 10% yaitu 122,10 °C

Kata kunci : Biogas, Absorpsi, NaOH, motor bensin

***EFFECT OF BIOGAS CLEANING WITH NaOH SOLUTION
TO RPM, TORQUE, EXHAUST GAS TEMPERATURE AND EMISSIONS
IN PETROL ENGINE***

KURNIA ARIF OKTOVIANTO
11/318948/TP/10193

ABSTRACT

Biogas is a renewable energy derived from biomass. Biogas contain CH₄ gas which can be used as a petrol engine fuel. Biogas also contained other gases such as CO₂, H₂O, and H₂S, gas which are polluter gas that are not useful. Percentage of CO₂ alone is large enough that 25% - 45%. CO₂ gas cleaning is needed to improve the effectiveness of biogas use in the petrol engine. One method to conduct CO₂ gas cleaning is absorption method performed by passing two substances with different phases, namely biogas and absorbent in opposite direction resulting in mass transfer. The research objective was to determine the effect of biogas cleaning using NaOH solution on rpm, torque, exhaust gas temperature and CO emissions on the motor. NaOH solutions used had several concentrations; 0% (no cleaning), 10%, 20%, and 30%. There were variations on the testing of petrol engine; 30%, 70% and 100% throttle opening. The results showed that the biogas cleaning could increase the rpm, torque, emissions of CO of the petrol engine, could reduce fuel consumption, and exhaust gas temperature was not affected by NaOH variations. The biggest Rpm produced at 100% throttle opening and NaOH concentration of 30% in the amount of 3261. The largest torque showed at 100% throttle opening and the NaOH concentration of 10% in the amount of 1,48 Nm. The most economical fuel consumption was on the 30% throttle opening and the concentration of NaOH 30% in the amount of 294.846 liters per 10 minutes. Lowest CO emission levels showed at the variation of 30% throttle opening and NaOH concentration of 0% in the amount of 0.018%. Lowest exhaust gas temperature was shown at the variation 70% throttle opening and 10% NaOH in the level of 122.10 °C.

Keyword: Biogas, Absorption, NaOH, Petrol Engine