

Efek penambahan dimethyl ether pada LPG terhadap emisi gas buang hasil proses pembakaran pada kompor = Effect of addition of dimethyl ether in LPG to emissions of combustion process on stove

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Abstrak

Dalam penelitian ini telah dilakukan pencampuran dimethyl ether (DME) dan liquefied petroleum gas (LPG) sebagai bahan bakar, kemudian menguji emisi gas buang serta nyala api dari hasil pembakaran bahan bakar tersebut pada kompor. DME yang ditambahkan pada LPG sebesar 10%, 20%, 30%, 35%, 40% dan 50% (v/v). Gas emisi yang di analisa adalah gas oksida-oksida sulfur (SO_x), oksida-oksida nitrogen (NO_x), dan karbon monoksida (CO). Pengambilan sampel gas emisi SO_x dan NO_x menggunakan alat Stack gas sampler (SGS), sedangkan gas CO menggunakan alat gas analyzer. Gas SO_x dianalisa menggunakan spektrofotometer dengan metode turbidimetri sedangkan gas NO_x dianalisa dengan metode phenol disulfonic acid . Efek penambahan DME pada LPG menurunkan emisi gas buang SO_x, NO_x dan CO. Pada LPG 100%, emisi gas SO_x yang dihasilkan sebesar 5,85 mg/m³, sedangkan pada campuran LPG 90%:DME 10%, LPG 80%:DME 20%, LPG 65%:DME 35%, dan LPG 50%:DME 50%, emisi SO_x yang dihasilkan masing-masing sebesar 5,187; 4,565; 4,190; dan 4,083 mg/m³. Emisi gas NO_x yang dihasilkan pada pembakaran LPG 100% sebesar 18 ppm, sedangkan pada campuran LPG 90%:DME 10%, LPG 80%:DME 20%, LPG 65%:DME 35%, dan LPG 50%:DME 50%, emisi yang dihasilkan masing-masing sebesar 10,425; 6,681; 6,870; dan 5,079 ppm. Emisi gas CO yang dihasilkan pada LPG 100% sebesar 9 ppm, sedangkan pada campuran LPG 90%:DME 10%, LPG 80%:DME 20%, LPG 70%:DME 30%, dan LPG 60%:DME 60%, emisi CO yang dihasilkan sebesar 7; 4; 3; dan 3 ppm. Masing-masing nyala yang dihasilkan pada campuran gas LPG-DME lebih biru dibandingkan gas LPG.

.....In this research has been done mixing dimethyl ether (DME) and LPG as fuel, then test the exhaust emissions and flames from the burning fuel on the stove. DME is added to LPG by 10%, 20%, 30%, 35%, 40% and 50% (v / v). Gas emissions in the analysis is the gas sulfur oxides (SO_x), nitrogen oxides (NO_x) and carbon monoxide (CO). The sampling of gas emissions of SO_x and NO_x using a Stack gas sampler (SGS), while the CO gas using a gas analyzer. SO_x gases were analyzed using a spectrophotometer by the turbidimetri method while NO_x gases were analyzed by the phenol disulfonic acid method. Effect the addition of DME to LPG is to lower emissions of SO_x, NO_x and CO. In the LPG 100%, SO_x gas emissions generated is 5.85 mg/m³, while the LPG mixture of 90%: 10% DME, LPG 80%: 20% DME, LPG 65%: 35% DME and LPG 50%: DME 50%, SO_x emissions are generated respectively are 5.187; 4.565; 4.190; and 4.083 mg/m³. NO_x emissions generated on combustion of LPG 100% is 18 ppm, while the LPG mixture of 90%: 10% DME, LPG 80%: 20% DME, LPG 65%: 35% DME and LPG 50%: 50% DME, emissions produced respectively are 10.425; 6.681; 6.870; and 5.079 ppm. Emissions of CO gas is produced on 100% LPG is 9 ppm, while the LPG mixture of 90%: 10% DME, LPG 80%: 20% DME, LPG 70%: 30% DME and LPG 60%: 60% DME, emissions CO produced are 7; 4; 3; dan 3 ppm. Each flame generated in LPG-DME gas mixture is more blue than the LPG gas.