Indoor air quality: comparison study on pollutant gases emitted from gas burners using different gas fuels

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Abstrak

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This study is intended to compare the performance of LPG fuel and CNG fuel under consideration from residential cooking fuel aspect as well as from its pollutant emission aspect. Fuel combustion using laboratory bumer (Bunsen bumer) was carried out. Emission of pollutant gases especially CO and NOx were observed and measured. Pollutant gas concentration in ambient air around the flame as pollution source produce by LPG combustion was compare to that producted by CNG combustion. Their flame characteristics especially their flame length and their flame color were maintained to be the same, so their heat losses and their temperature could be predicted (by calculation). The magnitude of flame temperature were used to conclude weather pollutant gases generated from combustion was caused by gas dissociation or by incomplete combustion. The result of experiment shows that LPG combustion emit more pollutants gases than CNG combustion does, and gases are caused by incomplete combustion.

ABSTRACT
Penelitian ini bertujuan untuk membandingkan kinerja bahan bakar LPG dan bahan bakar CNG ditinjau dari aspek bahan bakar memasak perumahan serta dari aspek emisi polutannya. Pembakaran bahan bakar menggunakan bumer laboratorium (Bunsen bumer) dilakukan. Emisi gas pencemar terutama CO dan NOx diamati dan diukur. Konsentrasi gas pencemar di udara ambien sekitar nyala api sebagai sumber pencemaran yang dihasilkan dari pembakaran LPG dibandingkan dengan yang dihasilkan oleh pembakaran CNG. Karakteristik nyala api terutama panjang nyala api dan warna nyala api dijaga agar tetap sama, sehingga kehilangan panas dan suhunya dapat diprediksi (dengan perhitungan). Besarnya temperatur nyala digunakan untuk menyimpulkan gas pencemar cuaca yang dihasilkan dari pembakaran disebabkan oleh disosiasi gas atau oleh pembakaran yang tidak sempurna. Hasil percobaan menunjukkan bahwa pembakaran LPG mengeluarkan lebih banyak gas pencemar daripada pembakaran CNG, dan gas disebabkan oleh pembakaran yang tidak sempurna.