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Flame Temperature Characteristics and Flue Gas Analysis of an Improvised Biogas Burner

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Abstract: *The flame temperature of a biogas burner vis-a- vis the methane content in the biogas and the flue gas analysis has been investigated. This study presents the results of an experimental investigation of a prototype and an improved burner to report the quality of biogas, which was produced from a mixture of cattle dung and poultry droppings operated as feedstock in the ratio of 1 part of dung and droppings to 2 parts of water at a retention time of 30 days. A liquefied natural gas burner was also used to do a comparative analysis. The flame temperature was carried out with the aid of a Kane – May (KM340) thermocouple. The ambient temperature of the flame produced was taken at three positions viz; the cone flame, the burning flame, and the flue gas. The results showed that the improvised burner had the lowest temperature at the three positions of measurement and provides room for subsequent improvement for household use in farmsteads and rural Nigeria. Also, flue gas analysis was carried out to establish the emissions of the stove. The combustion efficiency of the improved stove recorded by the flue gas analyser was 86.9%.*

Keywords: *Biogas, Temperature, Flame, Flue gas, Thermocouple*