

الآية

{أَوَلَمْ يَرَوْا أَنَّا خَلَقْنَا لَهُمْ مِمَّا عَمِلَتْ أَيْدِينَا أَنْعَامًا فَهُمْ لَهَا مَالِكُونَ (71)
وَذَلَّلْنَاهَا لَهُمْ فَمِنْهَا رَكُوبُهُمْ وَمِنْهَا يَأْكُلُونَ (72) وَلَهُمْ فِيهَا مَنَافِعُ وَمَشَارِبُ
أَفَلَا يَشْكُرُونَ (73)}

سورة يس الآية (71-73)

DEDICATION

To our parents who educated us and enabled us to reach this level, To our families who supported us, To the people who paved our way toward the pursuit of science and knowledge.

ACKNOWLEDGMENT

This research would not have been possible without Allah, and then the help of many people.

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ABSTRACT

Biogas is produced by anaerobic digestion of various organic substances such as kitchen wastes, agricultural wastes, municipal solid wastes, and cow dung. Biogas has a good ability of forming homogeneous mixture with air, and clean combustion nature; in contrast of harmful emissions that result from using another fuels, In addition to abundance of organic substances. In this project raw biogas contains about 57% methane (CH_4), 43% carbon dioxide (CO_2), traces of hydrogen sulfide (H_2S) and fractions of water vapor, 20.52 MJ/m^3 calorific value was tested as fuel for diesel-generator set through modified the diesel engine of generator to operate with biogas-diesel dual fuel system for supplying constant load, the test was covered the consumption rate of biogas in m^3/kwh , the percentage saving in the consumption rate of diesel fuel, and the percentage of increase the amount of exhaust carbon dioxide (CO_2). And the results were 0.45 m^3/kwh , 45%, 18.52%, respectively.

المستخلص

الغاز الحيوي هو غاز ينتج من عملية التخمير الأهوائي للمركبات العضوية كمخلفات المطبخ, المخلفات الزراعية, المخلفات البلدية ومخلفات المواشي. يتميز الغاز الحيوي بخاصية تكوين خليط متجانس مع الهواء وطبيعة إحتراقه النظيفة, بالمقارنة بالإنبعاثات الضارة الناتجة من إستخدام أنواع الوقود الأخرى . بالإضافة الى وفرة المواد العضوية . في هذا المشروع تم إختبار غاز حيوي بمحتوى حراري 20.52 ميغاجول/متر³ ومكونات حوالي 57% ميثان و43% ثاني أكسيد الكربون ونسب ضئيلة جدا من من كبريتيد الهيدروجين وبخار الماء, كوقود في ماكينة الديزل لمولد كهربائي, من خلال تعديل تلك الماكينة لتعمل بنظام وقود ثنائي (ديزل+غاز حيوي) لتغذية حمل ثابت. شمل الإختبار حساب معدل إستهلاك الغاز, نسبة التوفير في إستهلاك الديزل, و نسبة الزيادة في كمية غاز ثاني أكسيد الكربون و كانت النتائج كالتالي 0.45 متر³ كيلو وات ساعة, 45%, 18.52% على التوالي.

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LIST OF ABBREVIATIONS

UN	United Nations
CBG	Compressed Biogas
CNG	Compressed Natural Gas
IC	Internal Combustion
AC	Alternating Current
DC	Direct Current
RPM	Revolution Per Minute
AD	Anaerobic Digestion
GHG	Green House Gas
MEA	Monoethanolamine
CO	Carbon monoxide
HC	Hydrocarbon
NO _x	Nitrogen oxides
CH ₄	Methane
CO ₂	Carbon dioxide
N ₂ O	Nitrous oxide
H ₂ S	Hydrogen sulfide
FE ₂ O ₃	Iron(iii)oxide
NAOH	Sodium hydroxide
NAHCO ₃	Sodium bicarbonate
K ₂ CO ₃	Potassium carbonate
KOH	Potassium hydroxide
ZNO	Zinc oxide
H ₂ O	Water vapor
CHP	Combined heat and power
SI	Spark ignition
CI	Compression ignition