ASSESSMENT OF BIOGAS PRODUCTION FROM LEMON GRASS AND CHICKEN DROPPINGS

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A DISSERTATION SUBMITTED TO THE DEPARTMENT OF CHEMISTRY, COLLEGE OF SCIENCE AND TECHNOLOGY, IN PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN INDUSTRIAL CHEMISTRY OF COVENANT UNIVERSITY, OTA, NIGERIA.

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CERTIFICATION

This is to certify that this project was carried out by ADEKOYA Olaoluwa Funmi (16PCC01406) under the supervision of Prof. Akan B. Williams. This report has been read, approved and accepted as meeting the partial fulfilment of the requirements for the award of the degree of Master of Science in Industrial Chemistry, Covenant University, Ota, Nigeria.

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DEDICATION

This research work is dedicated to God Almighty, my help. He truly rules in the affairs of men.

DECLARATION

I, ADEKOYA Olaoluwa Funmi, hereby declare that this project report is based on the study undertaken by me in the Department of Chemistry, College of Science and Technology, Covenant University, under the supervision of Prof. Akan. B. Williams. This project report has not been submitted anywhere else for a degree award. The ideas and reviews are products of the research conducted by me. All sources of data and scholarly information of other researchers have been duly acknowledged.

ADEKOYA Olaoluwa Funmi ……

Signature & Date

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ABSTRACT

An assessment of biogas production from chicken droppings by anaerobic co-digestion with *Cymbopogon citratus* (lemon grass) was carried out. The composite pre-fermented substrates were mixed with water and the formed slurry was digested separately in five batch anaerobic plastic digesters for a period of 30 days. The pressure on the digester by the produced biogas was determined using a tri-axial quarter-bridge strain gauge rectangular rosette, carefully fixed to the external surface of the plastic digester. Hourly readings of corresponding gas pressures and digestion temperatures were recorded electronically. It was observed that the highest biogas yield was from lemon grass digested alone while the single digestion of chicken waste gave the lowest yield. Results showed that 100% chicken droppings produced 12.89 kP of biogas whereas *C. citratus* alone produced 42.00 kP. Co-digestion of 70% chicken droppings with 30% *C. citratus* was the optimum mixture as it enhanced and almost doubled the gas production of chicken droppings from 12.89 kP to 21.00 kP. The study has shown that the biogas production from chicken droppings could be enhanced by co-digestion with lemon grass.

Keywords: Biogas, strain gauge, anaerobic co-digestion, digester

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