

# **Performance Analysis of MEA in Anaerobic Co-digestion using Cow Dung, Poultry Droppings and Lawn Grass**

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## **ABSTRACT**

Biogas has an immense potential of energy, power and heat that can be used in places where energy is in high demand. However, the presence of contaminants such as carbon dioxide (CO<sub>2</sub>) and hydrogen sulphide (H<sub>2</sub>S) constitute hindering factors to its wide utilization. In this study, site visit was the first step employed. The purpose of the visit was to ensure that waste collected is viable for prospective experiments. After collection, waste was sorted in poultry, cattle, food and vegetation categories for preliminary analysis. Proximate and ultimate analysis, as well as X-ray fluorescence (XRF) analysis were conducted to identify the elemental composition of each substrate used particularly trace elements which are often inhibitory to biogas production processes. Raw biogas was purified through chemical absorption using monoethanolamine (MEA) at 1 M. MEA was used as organic solvent in three chemical absorption processes during each Bio-Methane Potential (BMP) test. Upon biogas upgrading, the generated biomethane was measured in the gas measuring device for 15 days. This investigation was conducted in accordance with the method described by APHA (2005) by means of the automatic methane potential test system II (AMPTS II). The AMPTS II enabled the measurement of accumulated volumes of biomethane of a 100 % purity in real-time during anaerobic co-digestion. This study aimed at assessing the behavioral patterns of MEA using different substrates under mesophilic conditions at the exact temperature of 37°C.

## **Keywords**

Absorption, biogas, carbon dioxide, monoethanolamine, substrates.