OPEN ACCESS Freely available online

Natural products chemistry and research

Commentary

The Use of Organic Wastes for the Production of Biomethane

Topwe Milongwe*

Department of Chemistry, University of Lubumbashi, Congo

INTRODUCTION

Organic reactions catalysed by enzymes are known as enzymatic reactions. The goal of this review is to add to the literature on enzymatic reactions that occur during the anaerobic breakdown of leftover organic molecules, with a focus on organic compound structures and reaction mechanisms. This enables researchers to comprehend how electrons are displaced between electron-rich and electron-poor entities to form new connections in products. The scientific literature has yet to analyse the exact mechanisms of enzymatic processes related to the generation of biomethane.

As a result, this review is unique and timely in that it analyses the chemical behaviour or reactivity of various functional groups, allowing for a better understanding of enzyme catalysis in the transformation of leftover proteins, carbohydrates, and lipids into biomethane and fertilisers. As a result of this knowledge, the total efficiency of biomethanation in industrial applications can be improved.

Biomethanation is a well-established process that uses microorganism enzymes to transform organic waste into biomethane and digestate fertiliser products. Biomethanation improves cleanliness, decreases foul odours, and minimises the usage of synthetic fertilisers and pesticides by valorizing organic waste. It also helps to minimise incineration and landfill dumping of organic waste, lowering greenhouse gas emissions like carbon dioxide and nitrous oxide. Biogas energy is particularly essential in areas where energy infrastructure is inadequate, such as Africa, because it decreases the consumption of fossil fuels, minimises deforestation, and improves people's livelihoods.

The purpose of this paper is to add to the existing documentation on the various enzymatic reactions that occur during anaerobic degradation (biomethanation) of residual organic substances, with a focus on organic compound structures and reaction mechanisms to explain the formation of various products. The scientific literature has yet to analyse the exact processes of enzymatic reactions related to the formation of biomethane and biofertilizer. The structures of organic substances, on the other hand, exhibit several functional groups at which chemical reactions can occur. It's crucial to know which functional groups of enzymes and substrates react with each other in order to better comprehend the production of the various products (biomethane and biofertilizer) in the reaction media.

Furthermore, the mechanisms of electron displacement and link formation in anaerobic degradation must be comprehended. All of this, in turn, can help direct future research into biomethanation optimization, such as increasing biomethane production or improving biofertilizer quality. In particular, this overview briefly covers the role of enzymes before presenting a selection of organic events catalysed by enzymes that occur during anaerobic digestion, such as hydrolysis, acidification, acetate synthesis, and methane production. Specific enzymes metabolise or degrade various substrates (proteins, carbohydrates, and lipids) in anaerobic fashion, whereas intermediate metabolites serve as starting materials for future enzymatic conversion to create methane and fertilisers. Examples of contemporary industrial applications including the use of enzymes to improve biomethanation efficiency

This study reviews the many processes of enzymatic reactions involved in the generation of methane and fertiliser from residual organic compounds in a clear and intelligible manner. This permits future research efforts in biomethanation to be guided in terms of optimising biomethane production and biofertilizer quality, for example. Knowledge of the enzymatic systems involved in biomethanation can aid in the accurate definition of pretreatment techniques that will strengthen the methane generation process.

ACKNOWLEDGEMENT

The author is very thankful to all the associated personnel in any reference that contributed in/for the purpose of this research.

CONFLICT OF INTEREST

The author has declared that no competing interests exist.

Correspondence to: Topwe Milongwe, Department of Chemistry, University of Lubumbashi, Congo; E-mail: topwe.mwenem@unilu.ac.cd

Received: December 08, 2021**; Accepted:** December 22, 2021**; Published:** December 29, 2021

Citation: Topwe M (2021) The Use of Organic Wastes for the Production of Biomethane. Nat Prod Chem Res. 9:422.