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Algae-Based Biofuel: An Oxidation and Primary Examination

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Introduction

The growing demand for sustainable and renewable energy sources has led to the emergence of the bio-based economy. One of the key components of this economy is the use of algae as a source of biofuels, particularly algae oil. Algae oil is an attractive alternative to conventional fossil fuels due to its renewable nature, low carbon footprint, and potential for high yields. In this paper, we will conduct an oxidation and structural analysis of bio-based algae oil to understand its chemical composition, properties, and potential applications Bio-based algae oil is composed primarily of triglycerides, which are esters of fatty acids and glycerol. The fatty acid composition of algae oil is highly variable and depends on several factors, including the species of algae, the growing conditions, and the harvesting method. The most common fatty acids found in algae oil include palmitic acid, stearic acid, oleic acid, and linoleic acid.

Description

In addition to triglycerides, algae oil also contains other minor components, including phospholipids, sterols, and carotenoids. Phospholipids are essential components of cell membranes and are important for maintaining membrane integrity and fluidity. Sterols, such as cholesterol, are important structural components of cell membranes and are involved in many cellular processes. Carotenoids, such as beta-carotene, are important antioxidants that protect cells from oxidative damage Bio-based algae oil has several unique properties that make it an attractive alternative to conventional fossil fuels. One of the key properties of algae oil is its high lipid content, which can range from 20% to 80% depending on the species of algae and the growing conditions. This high lipid content makes algae oil an attractive source of biofuels, particularly biodiesel. Another important property of algae oil is its low viscosity, which makes it an attractive option for use in diesel engines without the need for significant modifications to the engine. Algae oil also has a high flash point, which reduces the risk of combustion and increases safety during storage and transportation [1].

Algae oil has a low carbon footprint compared to conventional fossil fuels. Algae absorb carbon dioxide from the atmosphere during photosynthesis, which reduces the net amount of carbon dioxide released during combustion of the fuel. Algae also do not require arable land for cultivation and can be grown in non-arable land, such as deserts or waste land. One of the major challenges associated with the use of bio-based algae oil as a fuel is its susceptibility to oxidation. Oxidation is a chemical process that involves the loss of electrons by a molecule, resulting in the formation of free radicals. Free radicals can react with other molecules in a chain reaction, leading to the degradation of the oil and the formation of harmful byproducts. Several factors can contribute to the oxidation of algae oil, including exposure to light, heat, and air. Light and heat can accelerate the oxidation process by providing energy to break chemical bonds and initiate the formation of free radicals. Exposure to air can also accelerate the oxidation process by providing oxygen, which reacts with the free radicals to form harmful byproducts [2-5].

Conclusion

To understand the oxidation process of bio-based algae oil, several analytical techniques can be used, including Fourier transform infrared (FTIR) spectroscopy, gas chromatography-mass spectrometry (GC-MS), and differential scanning calorimetry (DSC). FTIR spectroscopy is a technique that can be used to identify functional groups in a molecule and monitor changes in these groups during oxidation. FTIR spectroscopy works by measuring the absorption of infrared radiation by the sample. Changes in the absorption spectrum can provide information about the functional groups present in the sample.

References

1. Youn, Su Hyun, Taeyong Sim, Ahnryul Choi and Jinsung Song, et al. "Multi-class biological tissue classification based on a multi-classifier: Preliminary study of an automatic output power control for ultrasonic surgical units." *Comput Bio Med COM* 61 (2015): 92-100.
2. Nagendran, Monica and Daniel Riordan."Automated cell-type classification in intact tissues by single-cell molecular profiling." *Elife* 7 (2018).
3. Gálvez, Juan Manuel, Daniel Castillo, Luis Javier Herrera and Belén San Román, et al. "Multiclass classification for skin cancer profiling based on the integration of heterogeneous gene expression series." *PloS one* 13 (2018): e0196836.
4. Hoover, Brian G and J. Scott Tyo. "Polarization components analysis for invariant discrimination." *Applied optics* 46 (2007): 8364-8373.
5. Van Manen, Labrinus, Jouke Dijkstra, Claude Boccara and Emilie Benoit, et al. "The clinical usefulness of optical coherence tomography during cancer interventions." *J Cancer Res Clin Oncol* 144 (2018): 1967-1990.

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