

It is thus concluded that the polyaniline-cinnamon oil composite material act as a strong corrosion inhibitor of mild steel in aqueous HCl medium.

**Keywords:**

Mild steel, Polyaniline-cinnamon oil composite, Corrosion inhibition, Tafel plot, Electrochemical Impedance Spectroscopy (EIS), Scanning Electron Microscopy (SEM)

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## Production of biodiesel using waste cooking oil and loose copra oil

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This study focuses on producing biodiesel from waste cooking oil (WCO) and loose copra oil (LCO). The aim is to reduce energy consumption by using low-cost raw materials and energy-saving methods. With the global energy crisis, it is essential to find a sustainable alternative fuel source that is economical, easily transportable and environmentally friendly. Biodiesel has become a popular alternative to fossil fuels, but its production has drawbacks, including high energy consumption, longer production times, and high raw material costs. This study aims to address these drawbacks by using low-cost raw materials and energy-saving methods. Isopropanol (10% w/w) was used as a co-solvent to reduce energy consumption during the transesterification process and NaOH (1 wt%) was used as the catalyst. The quality of the biodiesel produced was determined by examining the fatty acid profile and specific fuel properties. The study

found that both WCO and LCO can be used to produce biodiesel. Under the best conditions (oil: CH<sub>3</sub>OH- 1:6 molar ratio, reaction temperature- 60 °C, stirring rate- 750 rpm, reaction time- 90 minutes), the maximum biodiesel yields obtained for WCO and LCO were 88.50% w/w and 90.60% w/w, respectively under addition of 10% w/w isopropanol. The specific fuel properties such as density, kinematic viscosity, and flash point of both WCO and LCO were comparable to ASTM limits, indicating their potential as alternative fuels. This study provides a potential solution to the energy crisis by producing biodiesel from low-cost raw materials and energy-saving methods, which has the potential to be a more sustainable and environmentally friendly alternative to fossil fuels.

**Keywords:**

Energy crisis, Biodiesel, Trans-esterification, Waste cooking oil, Catalyst

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## A Computational Approach to Determine the Potential Inhibition of the Gomesin Peptide as an AKT1 Inhibitor in Breast Cancer

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Animal trials and *in vitro* drug screening can improve drug discovery. However, such pre-clinical screenings are often costly and time-consuming. Due to this, a more effective technique is developed using *in silico* method for the same. Drug repositioning using multi-omics data represents a more effective approach over traditional drug development for new cancer-fighting therapies. In this study peptide-based drugs are identified

as an excellent candidate due to their properties, such as different amino acid charges, various sizes, polarity, and non-polarity characteristics, producing a composition against microbes and tumor cells. The peptides with anticancer activity, known as anticancer peptides (ACP), are biocompatible and provide a higher degree of specificity and selectivity between cancer and cancer-free cells. Gomesin is a natural antimicrobial peptide (AMP)