ISGC 2022

N°898 / OC
TOPIC(s) : Biomass conversion / Energy

# Lipase-Catalyzed Biodiesel Production ? A Laboratory Experience

## AUTHORS

Lawrence DARKWAH / KWAME NKRUMAH UNIVERSITY OF SCIENCE & TECHNOLOGY (, CHEMICAL ENGINEERING DEPARTMENT, PETROLEUM BUILDING,, KUMASI

## PURPOSE OF THE ABSTRACT

The need for adoption of alternative fuels that are biodegradable and environmentally friendly is much more needed now for both climate change and economic reasons. There are large quantities of palm kernel oil in Ghana and it is a low-cost feedstock for ethyl ester production. The high cost of lipase has hindered the commercialization of lipase-catalysed transesterification hence seeking for cheaper ones. This study sought to produce ethyl ester using Porcine pancreas lipase as catalyst and palm kernel oil as feedstock. This experimental procedure contributed to optimizing ethyl ester conversion rate and aided in a reduction of the reaction time and lipase concentration. Moisture content of 5% v/v of oil, lipase concentration of 3% w/w of oil and a 24-hour reaction time are some of the conditions that produced optimum ethyl ester conversion. An ethyl ester conversion of 85% was achieved in a 24-hour reaction time and onetime acyl acceptor addition. Since more ethyl esters can be produced within relatively shorter periods with less lipase using this procedure, further studies can be conducted to justify its commercial viability followed by potential feasibility studies.

## FIGURES

FIGURE 1

FIGURE 2


## KEYWORDS

Lipase | palm kernel | Porcine pancreas | ethyl ester


## BIBLIOGRAPHY