CHARACTERIZATION OF CASTOR BIODIESEL BLENDED WITH CONVENTIONAL DIESEL FUELS

Rasheed Amao Busari[1*], Joshua Olanrewaju Olaoye[2], Adeshina Fadeyibi[1], Timothy Denen Akpenpuun[2,] Murtala Olayode Iyanda[2] and Segun Emmanuel Adebayo[3]
[1]Department of Food and Agricultural Engineering, Kwara State University Malete, Kwara State, Nigeria.
[2]Department of Agricultural and Biosystems Engineering, University of Ilorin, Ilorin, Nigeria
[3]Department of Agricultural and Bioresources Engineering, Federal University of Technology, Minna, Niger State.

*Corresponding Author's email address: rasheed.busari@kwasu.edu.ng

ABSTRACT

Compression Ignition Engines have proved its usefulness in agriculture, transportation, and power sector. In this research, the physicochemical properties of different blends of castor biodiesel were compared with conventional diesel fuel. Samples of the castor biodiesel prepared using transesterification processwere blended with the conventional biodiesel in different mixed ratios, namely B5, B10, B15, B20, B25,B50 to B100. The physicochemical properties, including density, flash point and kinematic viscosity were determined following standard and international procedures (ASTM). Results show that the B100 has higher density, kinematic viscosity and flash point compared to the conventional diesel at 280 °C. But the calorific value was lower in comparison. A gradual decrease in the density, flash point and kinetic viscosity were observed with a decrease in the biodiesel blends from B100 to B5. This implies that the castor biodiesel can be used as a close substitute for the conventional diesel fuel and has substantial advantages, especially in area of greenhouse control and energy security.

Keywords: Castor biodiesel, Diesel fuel, Analysis, Diesel engine and Physico-chemical.

1. INTRODUCTION

Fossil fuels are energy sourced from non-renewable and environmental unfriendly resulting from the combustion of fuels either from heavy duty machines, transport vehicles, industrial machines, or residential homes. Alternative fuels from non-edible or domestic sources are emerging as a solution to the declining reserves of convectional fuels. Biodiesel is becoming more popular in developed nations, a renewable mono-alkyl ester that is produced from vegetable oils, by a transesterification reaction. Serrano *et al.* (2012) reported that the use of biodiesel in Europe