

Characterisation of Sawdust Combustion in an Experimental Model Bubbling Fluidized Bed Combustor (BFBC)

- Iseru, Ebike
- Ufuoma, Emifoniye Early

Abstract:

The need to explore alternative energy sources in meeting global energy demands is becoming more significant as a result of the twin problems of fossil fuel depletion and global warming. Biomass constitutes a readily available alternative source of energy. However, there are inherent difficulties in burning biomass due to its high moisture content. Among the available technologies that can be used for biomass combustion, the fluidized bed combustor is emerging as one of the best due to its flexibility and high efficiency. This study investigates the combustion characteristics of sawdust in a bubbling fluidized bed combustor. The experimentation was carried out in the locally fabricated BFBC under two biomass feed rates of 2.6kg/h and 3.5kg/h, and varying excess air (EA) values. The effects of fuel feed rate and excess air on the concentration of major gaseous emissions (CO and CO₂) in flue gas, combustion efficiency, and the thermal profile along the combustor height were studied. The combustion efficiency of the fluidized bed combustor was calculated for the sawdust fired under different operating conditions, based on the CO concentration in the flue gas. A maximum efficiency of about 99 % was obtained with acceptable CO emission.

Research areas:

- [International Journal of Engineering Emerging and Scientific Discovery](#)

Year:

2017

Type of Publication:

Article

Keywords:

[Biomass](#); [Combustion efficiency](#); [Feed rate](#); [Excess air](#); [Temperature](#)

Journal:

International Journal of Engineering and Emerging Scientific Discovery

Volume:

2

Number:

4

Pages:

49-60

Month:

December

ISSN:

2536-7269