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Abstract

Experment were carried out to receive the fundamental data on parameters that characterize the combustion of Bagasse in a fixed bed reactor that composed of flame propagation velocity, combustion rate.

The experiments were performed as batch and bagasse was used as fuel. The variables investigated are air to fuel ratio, input air speed and temperature of primary air. The varying conditions were operated as follows: total air supply in the rates of 200, 300 and 400 LPM having air primary speed of 188, 282 and 377 mm/s respectively. In addition to normal temperature of combustion air that supplied to the bottom of the bed, temperature of primary air input were also heated by air heater before entry to the furnace at the temperature of 100, 150 and 200 ^{O}C. Axial temperature along the bed height and continuous monitoring of gases emission were recorded. These results were conducted to calculate the parameters concerned as mentioned earlier. The results disclose that bagasses combustion at ambient temperature (non-preheat of primary air) is governed by volatile combustion with char combustion following instantaneously. The combustion rate varies from 0.044-0.338 g/s. and flame speed from 1.59-2.87 mm/s depending on speed and volume of air. Combustion rates are 0.076, 0.188 and 0.338 g/s and flame speed are 1.86, 1.71 and 1.69 mm/s for total air of 200, 300 and 400 LPM respectively. When primary air velocities reduced, Combustion rates reduced to be 0.044, 0.085 and 0.177 g/s whereas flame speeds increased to be 2.87, 1.94 and 1.59 mm/s for the velocity of 94, 141 and 188 mm/s. When increase primary air temperature, the range of combustion rate and flame speed changed to be 0.017-0.114 g/s and 2.46-5.55 mm/s respectively by which depending on only . Depending on volume of air and primary air of velocity with total air is 200, 300 and 400 LPM and primary air

of velocity is 188, 282 and 377 mm/s results combustion rate 0.036, 0.051 and 0.077 g/s and flame speeds 4.37, 3.72 and 3.50 mm/s. When primary airdrop is 0.094, 0.141 and 0.188 m/s results combustion rate lower is 0.028, 0.56 and 0.076 g/s and flame speeds increased is 5.43, 5.55 and 5.30 mm/s. However, In the increasing total air and primary air temperature non-combustion rate increase from bagass combustion at ambient temperature.

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_____Chairperson