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# Modelling and simulation of banana (*Musa spp.*) waste pyrolysis for bio-oil production

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## Abstract

Banana (*Musa Spp.*) is a widely cultivated fruit in tropical West Africa and it generates a lot of waste due to its single fruit production per lifecycle and relatively large plant size. The recovery of energy from biomass is achievable through different thermochemical process among which pyrolysis is a key technique. In this study, ASPEN Plus v8.8 was used to develop a steady state simulation model for the predicting of pyrolysis product yields for different banana (*Musa Spp.*) wastes. The results obtained revealed bio-oil yields of 26.7%, 39.9% and 35% from the pseudo-stem, peel and leaves respectively. The pseudo-stem gave the highest char yield while gas yields were similar for all samples pyrolysed. The results showed that the peel will give more oil yield than the other banana wastes. Consequently, all banana (*Musa Spp.*) wastes has been shown to be inherently more suitable for char optimised production processes due to their compositional characteristics.

Keywords: Pyrolysis, Biomass, Banana waste, Simulation, Bio-oil, ASPEN Plus

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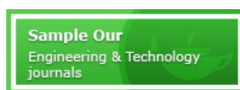
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