

The Study of Temperature Profile and Syngas Flare in Co-gasification of Biomass Feedstock in Throated Downdraft Gasifier

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ABSTRACT

Biomass gasification is a common technology, which converted solid biomass into gaseous fuel at high temperature reactions in the presence of gasification agent. In this paper, co-gasification of lignocellulosic biomass materials with oil palm fronds (OPF) in a downdraft gasifier is presented. The biomass feedstocks considered were sugar cane bagasse (SCB) and wood (*acacia mangium*). Only one material was co-gasified with OPF at a time, with blending ratios of 80:20, 50:50 and 20:80. The resulting temperature profiles in the reactor and the syngas flare duration were recorded. It was found that the blend of 80:20 wood and OPF gave the best result as it produced the longest steady flare duration (49.5 min). On the other hand, a significant bridging problem was observed in the co-gasification OPF and SCB, and thus implying the need for process improvement.

KEYWORDS: Co-gasification; Downdraft gasifier; Blending ratio; Temperature profile

DOI: [10.1007/978-981-287-505-1_24](https://doi.org/10.1007/978-981-287-505-1_24)