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# Removal of Tar Contents in Syngas by Using Different Fuel from Downdraft Biomass Gasification System

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**Abstract :** Biomass gasification is a process of converting solid biomass ingredients into a combustible gas which can be used in electricity generation. Regardless of their applications in many fields, biomass gasification technology is still facing many cleaning issues of syngas. Tar production in biomass gasification process is one of the biggest challenges for this technology. The aimed of this study is to evaluate the tar contents in syngas produced from wood chips, corn cobs, coconut shells and mixture of corn cobs and wood chips as biomass fuel and tar removal efficiency of different cleaning units integrated with gassifier. Performance of different cleaning units, i.e., cyclone separator, wet scrubber, biomass filter, and auxiliary filter was tested under two biomass fuels. Results of this study indicate that wood chips produced less tar of 1736 mg/Nm$^3$ as compared to corn cobs which produced tor 2489 mg/Nm$^3$. It is also observed that coconut shells produced a high amount of tar. It was observed that when wood chips were used as a fuel, syngas tar contents were reduced from 6600 to 112 mg/Nm$^3$ while in case of corn cob, they were reduced from 7500 mg/Nm$^3$ to 220 mg/Nm$^3$. Overall tar removal efficiencies of cyclone separator, wet scrubber, biomass filter, and auxiliary filter was 72%, 63%, 74%, 35% respectively.

**Keywords :** biomass, gasification, tar, cleaning system, biomass filter
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