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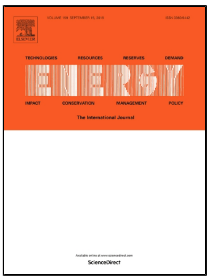

Co-gasification of Municipal Solid Waste and Biomass in a Commercial Scale Downdraft Gasifier

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Co-gasification of Municipal Solid Waste and Biomass in a Commercial Scale Downdraft Gasifier

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Abstract

In this study, municipal solid waste was gasified with switchgrass, i.e., co-gasification, using a commercial-scale downdraft gasifier to produce power. The experiments were performed using a commercial-scale 100 kg/h downdraft gasifier at co-gasification ratios of 0, 20 and 40%. The hot and cold gas efficiencies, syngas compositions, heating value and yield, gasifier temperatures and tar content were measured and analyzed. The results indicate that co-gasification of up to 40% MSW performed satisfactorily. The heating values of syngas were 6.2, 6.5 and 6.7 MJ/Nm^3 for co-gasification ratios of 0, 20 and 40%, respectively. The cold and hot gas efficiencies were 60.1, 51.1 and 60.0% and 65.0, 55.2 and 64.4% for co-gasification ratios of 0, 20 and 40%, respectively.

Keywords: Municipal solid waste (MSW), switchgrass, co-gasification, syngas, downdraft gasifier

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