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Waste Biomass Management – A Holistic Approach

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Contents

Biomass Gasification

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Abstract This chapter discusses the state of the art in biomass gasification studies. It initially gives a brief account on the energy potential and characterization of different biomass fuels. A review of the mechanisms of biomass gasification process and influence of major operating conditions on syngas composition and heating value (HV) was presented. Consideration of syngas quality requirements for different downstream applications and the means of achieving the same through optimum operation were highlighted. The theoretical studies of gasification process mainly focused on prediction of syngas composition and investigating influence of various operating conditions on process output. The equilibrium modeling assumes conditions of the ideal, well-stirred reactor with sufficiently long residence time to allow the reactions to reach equilibrium. Kinetic models present detailed information on the residence time and kinetic limitations; however, equilibrium models were widely used as a valuable tool in predicting the thermodynamic limits of chemical processes.