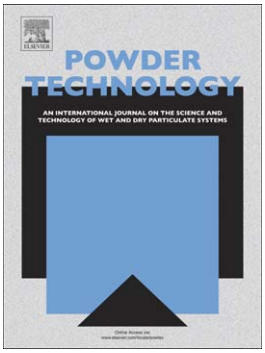

A two dimensional Euler-Lagrangian model of wood gasification in a charcoal bed — Part III: Parameter influence and comparison

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A two dimensional Euler-Lagrangian model of wood gasification in a charcoal bed – Part III: parameter influence and comparison

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Abstract

The efficient utilization of biomass in fluidized bed reactors depends on numerous operation conditions and parameters which can be investigated systematically with computational models. Based on a previous study [1] we compare a base scenario which mimics the experimental situation with different parameter settings for an Euler-Lagrangian simulation of wood gasification in a fluidized charcoal bed. For the varied parameters superficial velocity, reactor wall temperature, air inlet temperature, wood particle size, and the wood inlet temperature we analyse the simulation results based on data for temporal evolution of reactor outlet temperature, averaged particle temperature, overall wood mass, overall charcoal mass, concentrations of several gaseous species (N_2, CO, CO_2, H_2, H_2O, CH_4, C_2H_2, and three virtual tar components) and axial barycenter data of particles bed mass. Furthermore we show time averaged data for gaseous species and gas phase temperature at the reactor outlet. At the end we critically examine our findings under

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