

Numerical Study on Steam Gasification in a Dual Fluidized Bed Biomass Gasification System

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A numerical model for biomass steam gasification in dual fluidized bed (DFB) is studied based on mass and energy balances. Gasification in the bubbling fluidized bed (BFB) gasifier is calculated by using a thermodynamic equilibrium model. Complete combustion of both unconverted char and additional fuel is assumed in the combustion reactor (riser). The heat required for gasification reaction is provided by the circulating bed material (silica sand). Experimental data collected from the literature is compared to the numerical prediction. Effects of reaction temperature and steam/fuel ratio on the heating value of the product gas and the overall performance of DFB gasification are evaluated.