Hydrodynamics of Dual Fluidized Bed Gasifier in Cold-bed

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Gas and particle hydrodynamic behaviors of the riser and the bubbling fluidized bed (BFB) gasifier are investigated for a pilot-scale dual fluidized bed (DFB) gasification process, using a CFD code (Fluent, USA). Silica sand (solid phase) and air (gas phase) are used in the DFB gasifier of cold-bed.

A two-dimensional and isothermal flow is taken into account for both continuous and dispersed phases in which a multifluid Eulerian model incorporating kinetic theory of solid particles is applied to solve the unsteady-state behavior of the gas-solid flow. The interaction between gas and particles is considered in terms of the drag forces. Conservation equations of mass and momentum for each phase are solved using the finite volume method. The simulation results are compared to experimental data obtained from the cold DFB gasifier.