MATHEMATICAL MODEL FOR COAL GASIFICATION IN CIRCULATING FLUIDIZED BED REACTOR

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A mathematical model and a numerical algorithm of coal gasification in a circulating fluidized bed reactor has been developed. It is the steady state model based on bed hydrodynamics, global reactions kinetic of coal devolatilization and coal char gasification. The simulated results of product gas and char yield, temperature and compositions have been compared with the obtained experimental data from a pilot-scale 300 kg/h circulating fluidized bed gasifier. The results of predictions of the simulations have been found to be in good agreement with the experimental results. The model can be used to study and optimize the operation of the circulating fluidized bed gasifier changing several parameters, such as coal type and reactor geometry.

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