

Process modeling of CO₂ capture process using dry sorbents in twin fluidized bed reactors

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Process modeling of CO₂ capture emitted from the coal-fired power plant using twin fluidized bed reactors was carried out. The process is composed of inter-connected absorber and regenerator. The solid sorbent assumed as Potassium carbonate circulates with the given mass flow rate obtained from rigorous model. For describing the reaction, the homogeneous model was used with the assumption of reaction rate limiting process. The process modeling is developed for 2000 Nm³/hr flue gas that is corresponding to the flue gas from 0.5MW plant. Bubbling fluidized bed (BFB) and fast fluidized bed (FFB) were considered as gas-solid reaction and for each cases, mass and heat balance were calculated. Results include the comparison of process performance for BFB and FFB and parameter studies.