Co-combustion Characteristics of Coal and Sludge in an Internally Circulating Fluidized Bed Reactor

전진희, 김상돈*, 김승재[1], 강 용[2]
한국과학기술원; [1]전남대학교; [2]충남대학교
(kimsd@kaist.ac.kr*)

Co-firing of coal and sludge has been considered as an environmentally sound and economic approach. Co-firing of solid wastes in a FBC is one of the most promising technologies due to high heat and mass transfer rates of FBC. Therefore, in the present study, a square shaped internally circulating fluidized bed has been developed for easy modulation for scale-up purpose. The effects of bed temperature (700 - 900 ℃), coal feed rate (1 - 4 kg/hr), excess air ratio (1.0 - 1.3), gas velocity to the draft tube (3 - 6 U_{mf}) and gas velocity to the annulus tube (1 - 1.3 U_{mf}) on the overall combustion efficiency have been determined in the square internally circulating fluidized bed combustor (0.28 m-width, 2.6 m-height) with an orifice-type square draft tube (0.1 m-width, 0.9 m-height). The overall combustion efficiency increases with increasing excess air ratio, but decreases with increasing gas velocity to the draft tube. The obtained overall combustion efficiency in the internally circulating fluidized bed is somewhat higher than that in a bubbling fluidized bed combustor. Therefore, the present square internally circulating fluidized bed is an effective tool for co-firing of coal and sludge.