A Model on a Bubbling Fluidized Bed Chemical Looping Combustor for Methane

최정호*, 전영욱[1], 김상돈[2], 류호정[3]
건국대학교; [1]SK Energy; [2]KAIST; [3]한국에너지기술연구원
(choijhoo@konkuk.ac.kr*)

Much attention is being paid to the chemical looping combustion method because it can separate produced CO_2 in the combustion system. A mathematical model has been developed to predict performance of a continuous bubbling-bubbling fluidized-beds (fuel reactor and air reactor) chemical looping combustor for methane. The model considered the particle population in both fluidized beds together with particle entrainment and attrition. The oxidation and reduction rate of oxygen carrier particles were obtained from the thermo-gravimetric analyzer (TGA) tests. The model takes utilization efficiency of oxygen carrier particles, residence time of particles in each reactor, and particle size into consideration for reaction rates. The model has been applied to a laboratory-scale bubbling-bubbling annular fluidized-bed process. It employed a type of Ni-base oxygen carrier particles. The present model could provide a useful way to predict parametric effects of process variables.