Transport Disengaging Height of Iron Particles in a Fluidized Bed

고창국, 최정후[1], 김상돈*
한국과학기술원; [1]건국대학교
(kimsd@kaist.ac.kr*)

Research and development of smelting reduction processes and direct reduction processes without any pretreatment have been conducted as alternatives to blast furnace. Since fluidized bed reactor is appropriate one for gaseous reduction with many advantages, to develop a new iron making process employing a fluidized bed reactor is an important research topic. In the present study, transport disengaging height (TDH) of iron particle has been determined to provide fundamental data to develop a fluidized bed reduction system. The effects of particle size distributions and gas velocity on TDH were determined. Experiments were carried out in a fluidized bed made of transparent acrylic column (0.11 m-i.d. x 2 m-high). The fluidizing bed material was hematite with a density of 3.98 g/cm3 and the size range of 0.125 - 4.75 mm. The axial solid holdup distribution was measured by a sampling probe to determine TDH in the bed with variation of gas velocity. The effect of particle size is more pronounced than gas velocity on TDH and an empirical equation is derived to determine TDH as a function of Froude and Archimedes numbers.