Heat Transfer Characteristics in SBCR in View of Design

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Characteristics of heat transfer were investigated in a pressurized slurry bubble column reactors whose diameter were 0.051, 0.076, 0.102, 0.152 m (ID) and 1.0 m in height respectively. Effects of gas velocity(UG), solid contents(SC), pressure(P) and column diameter(D) on the heat transfer coefficient between the immersed vertical heater and the bed have been determined. The heat transfer coefficient was well analyzed and correlated by means of energy dissipation rate in the bed based on the surface renewal concept at the heater surface. In addition, the heat transfer coefficient was well correlated in terms of dimensionless groups based on the isotropic turbulence theory.