

제철고로공정의 열유동 반응해석

진홍종[†](KAIST) · 최상민^{*}(KAIST)**Mathematical modeling analysis of thermo-fluid reaction in the blast furnace process**

Hongjong Jin, Sangmin Choi

Key Words: Modeling(모델링), Blast furnace(고로), Solid bed(고체층), Combustion(연소)

Abstract : Analysis of the internal state of the blast furnace is needed to predict and control the operating condition. There are many phases of material, such as iron ore, coke, reduced iron oxide, molten metal, gas and pulverized coal in the blast furnace process which is classified into counter-current moving bed reactor. Especially, heat and mass transfer, various chemical reactions and phase changes occur simultaneously. These complex phenomena in the furnace must be incorporated in the mathematical modeling.

In this paper, generalized concept of solid fuel combustion is introduced to analyse the blast furnace process because the reduction process of ore is viewed by solid fuel bed combustion. Through this approach, solid flow, heat and mass transfer, chemical reaction and phase change in the furnace would be modeled in 2D axi-symmetry using commercial computational analysis tool.

실내 모멘텀 소스 변화에 따른 환기성능 비교

노광철[†](서울시립대 원) · 오명도^{*}(서울시립대)**Comparison of Ventilation Performance With Variations of Indoor Momentum Source**

Kwang-Chul Noh and Myung-Do Oh

Key Words: Carbon Dioxide(이산화탄소), Room Air Diffusion System(실내환기시스템), Ventilation Performance(환기성능)

Abstract : The numerical study was performed for the comparison of ventilation performance with variations of indoor momentum source. CO₂ concentration and local mean air-age of the room were calculated with respect to the intensity and the location of momentum source, occupancy and methods of room air diffusion. The numerical results showed that ventilation performance of the room was strongly affected by methods of room air diffusion. Their maximum difference of CO₂ concentration between a mixing system and a displacement one was about 300ppm in the occupied zone of the same-sized room. And we found out that ventilation performance is getting better or worse with variations of the intensity and the location of momentum source. It is due to that the intensity and the location of momentum let the residence time of air be longer or shorter in the room.