عنوان مقاله:

Optimization of Blast Furnace through Reducing Coke Consumption and CO۲ Emission using HSC Software

محل انتشار:

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خلاصه مقاله:

In this paper, a comprehensive evaluation of the charged materials, energy consumption and CO۲ emissions of blast furnace (BF) is done by relating the operating data from the Esfahan steel company (ESCO) with the established static process models. The mass and energy balance calculations were performed using the HSC software. This model is capable of predicting ۱۶ independent variables of the ۱۵۰ total variables at the same time. The model was verified by comparing the results with the ESCO BF No. ۳ off gas, slag and dust composition and were found in ۸% deviation from the operating data. The model indicated that increasing the hot air blast temperature and CH۴ injection, reducing coke ash level and slag volume in the product improved the plant productivity. Compared with a convectional BF, the results of optimization showed that the energy consumption, CO۲ emission and coke consumption were reduced by ۳% (~۱۸۳ Gj/THM), ۱۶% (~۰.۵۶ kg/THM) and ۱۵% (~۷۹.۵ kg/THM), respectively. The energy efficiency was calculated at ۸۱.۸۴% and was increased by about ۵% in the optimizing conditions.

کلمات کلیدی:

blast furnace, Mass and Energy Balance, HSC Software, CO۲ emission, energy consumption