An economic optimization model of an iron making process

권수형, 이인범*, 김현주, 안유찬, 빈영욱
POSTECH
(iblee@postech.ac.kr*)

The iron and steel making industry is the largest energy consuming manufacturing industry in the world, and has been under social pressure to reduce energy consumption and environmental load for increasing social awareness on environmental and resource problems. We provide an example for modeling of an iron making process, which consists of sintering, coke-oven, blast furnace and hot stoves, with an analysis on material and energy balances. The preheated air called hot blast is supplied to the blast furnace by the hot stove. The use of high blast temperature generally decreases the coke consumption in the blast furnace. We present that the high calorific value of COG could be saved using oxygen enrichment while maintaining the blast temperature and the saved COG could be utilized in several ways. We develop an input-output model for material and energy flow using spreadsheet program optimized the process by solving a mixed integer linear programming problem.