

Title: Physical Separation Technology with Fluidized Bed for Recycling Used Refractory

Name: Yuki TAKAKI[1)], Masato SASAKI[1)], Yoshiaki NISHINA[1)], Kyohei ISHIDA[1)], Yukinori IIZUKA[1)], Tatsuya ZUSHI[2)] and Yasuo KUBO[2)]

1) JFE Steel, 1-1, Minamiwatarida-cho, Kawasaki-ku, Kawasaki 210-0855, Japan
2) MM Nagata Coal Tech, 10-1, Kitaminato-cho, Wakamatsu-ku, Kitakyushu 808-0027, Japan

In iron-making and steel-making processes, many kinds of refractory are used. They are discharged as by-product after used and contain many recyclable valuable materials. However there are problems with recycle of these materials because there are impurity contaminations. Among many types of refractory, we focused on refractories used in blast furnace trough in this study.

The refractories of blast furnace trough consist of silicon carbide and alumina which are valuable materials. About 40% of the construction amont is discharged as used refractories after use. The used refractories contain 5 ~ 10% of slag which adheres to surface of refractories during use. Calcium oxide, the main component of slag, causes a decrease in the performance of recycled refractories. For performance of recycled refractories, it is necessary to reduce the slag content to 2.0%.

We focused on difference of density of the slag and the used refractory, and developed a new method using floating and sinking phenomenon in fluidized bed. This method uses only powder with adjusted density and air blowing from the bottom. Therefore, the environmental load of this method is lower than the conventional wet density separation method.

We made continuous processing equipment and performed continuous separation test using the fluidized bed which density is adjusted to the density between slag and refractory. As a result, we succeeded in reducing the slag content to 0.4% and achieved the target value.

Biography

Mr. Yuki Takaki recieved the master’s degree in mechanical engineering from The University of Tokyo in 2013. After completing his master's degree, he joined JFE Steel Corporation, a Japanese steel manufacturer. He has been engaged in development of the equipments in the steel works.

Presenting author details

Full name: Yuki Takaki
Contact number: +81-44-322-6218
Session name/ number: Track 7:Industrial Waste Recycling
Category: Oral presentation