INFLUENCE OF MAXIMUM TEMPERATURE, HOLDING TIME AND COOLING RATE ON THE STRENGTH OF SINTER ANALOGUES

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Content

Typically a large proportion of the ferrous burden charged to the ironmaking blast furnace is iron ore sinter. The quality of iron ore sinter has a strong influence on the productivity and fuel efficiency of the furnace, therefore high quality sinter is desirable. Individual pieces of sinter product from industrial sinter strands and sinter pot test are variable in composition and structure. This is caused by heterogeneous distribution of raw materials and spatial differences sintering conditions (temperature profile and pO2), and complicates analysis of sintering mechanisms. To reduce the variability in sinter samples an infra-red rapid heating furnace was used to produce laboratory scale analogue sinter tablets under tightly controlled conditions. The tablets were made from nuclear ore particles (1.0-0.71 mm) and fluxed ore ultra-fines (-0.25 mm). The mechanisms driving changes in sinter structure and mineralogy, and the subsequent impact on sinter quality, were investigated using scanning electron microscopy (SEM), optical microscopy, BET and high resolution X-ray CT. The quality of the laboratory scale sinters was measured using an axial compression strength test and a modified reducibility test.

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