

Factors governing slag cleaning in an electric furnace

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Slags from the El Teniente Converter have high copper and magnetite contents. The reduction and copper impoverishment of these slags in an electric furnace were simulated in the laboratory as part of a conceptual study for the Las Ventanas Smelter of ENAMI. The effects of power input, electrode immersion, slag temperature and coke and solid revert additions on the rate of magnetite reduction and copper recovery were investigated. It was found that the rate of slag reduction is strongly dependent on electrode power density. The addition of solid reverts containing copper matte enhanced the recovery of copper. Magnetite stratification and a corresponding gradient in copper content occurred in the slag. The experimental results, combined with an analysis of the phenomena taking place in an electric furnace, led to an improved understanding of the slag cleaning mechanism and contributed to the successful start up of the slag cleaning electric furnace at the Las Ventanas Smelter.