

ENHANCING THE RATE OF SLAG-METAL REACTIONS IN IRON AND STEELMAKING

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Experiments have been conducted to demonstrate that the slag-metal reaction between iron oxide and solute carbon is electrochemical, and that the rate of this reaction can be increased by applying a DC voltage across the slag layer. It is possible to use this approach to increase the rate and extent of other slag-metal reactions. Mathematical modeling is used to compare the extent of rate-enhancement by applied DC voltage, changing slag composition, increasing process temperature, and increasing agitation of the slag layer.