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Solid state decarburization of high carbon ferrochromium

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A high carbon ferrochromium alloy containing 6.8% C was subjected to solid state decarburization process conducted under a gaseous mixture of CO and CO₂ at temperatures between 800°C and 1100°C. The carbide phases present in the initial alloy was identified in the form of (FeCr)₇C₃. The degree of decarburisation increased with increasing temperature and decreasing particle size. A maximum of 58% decarburization was achieved with (-1.00+0.50) μm size fraction group reacted at 1100°C under pure CO₂ which yielded 2.82% C content in the final decarburized alloy. The carbide phases present in the final alloy was identified by XRD analysis in the form of Fe₃C and Cr₂₃C₆. The carbon analysis were based on the SEM-EDS results and verified according to the mass balance calculations. The final carbon content which depends upon temperature and particle size is in the range of carbon content of a medium carbon ferrochromium alloy.

Biography

A Bhalla is currently pursuing his PhD from the University of Witwatersrand under the supervision of Prof. R Hurman Eric.

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