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Wasteless Solid-Phase Method for Conversion of Iron Ores Contaminated with Silicon and Phosphorus Compounds

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Abstract : Based upon generalized analysis of modern know-how in the sphere of processing, concentration and purification of iron-ore raw materials (IORM), in particular, the most widespread ferrioxide-silicate materials (FOSM), containing impurities of phosphorus and other elements compounds, noted special role of nano technological initiatives in improvement of such processes. Considered ideas of role of nano particles in processes of FOSM carbonization with subsequent direct reduction of ferric oxides contained in them to metal phase, as well as in processes of alkali treatment and separation of powered iron from phosphorus compounds. Using the obtained results the wasteless solid-phase processing, concentration and purification of IORM and FOSM from compounds of phosphorus, silicon and other impurities excelling known methods of direct iron reduction from iron ores and metallurgical slimes.

Keywords : iron ores, solid-phase reduction, nanoparticles in reduction and purification of iron from silicon and phosphorus, wasteless method of ores processing
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