

The liquid-phase process of smelting reduction in an electric furnace with bottom electrodes in metallurgical DC furnaces

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Abstract: The paper devoted to the scientific bases of energy-efficient, environmentally friendly competitive smelting reduction processes, implemented in the electric furnace with two bottom electrodes. The furnace with bottom electrodes in laboratory experiments shows big industrial potential in comparison with well-known electrical furnaces such as DC arc furnaces and AC arc furnaces. The biggest advantages of such furnace are direct power supplied to the remelting materials, working without graphite electrodes, low energy losses, environmental friendly according to low dust production. The preliminary numerical simulation of this furnace and the first steps for numerical optimization and estimation of the industrial potential of such furnace are presented.

Keywords: Numerical simulation, Electro-vortex flow, DC metallurgical furnace

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