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The study of the slags viscosity of high-carbon ferrochromium

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Abstract

The supplied chrome-ore materials of different deposits in Russian ferro alloys plant is analyzed. It is shown that modern ore materials are characterized by significant difference im composition of the waste material in addition to the lower content of the leading elements. The main reason in ambiguous behavior of materials in the production chromium alloys are wide the production chromium alloys Wide variations in the content of Al_2O_3, MgO and SiO_2 in charge materials are the main reason for their ambiguous behavior in the smelting of chromium ferroalloys.The chemical and phase composition of the raw materials changes, when changing to new types of chromic ore. Hence the composition and properties of the smelting products, both metallic and oxide change. A new slag composition is formed, which has new physico-chemical characteristics.

The compositions of multicomponent oxide melts corresponding to industrial slags of the smelting of high-carbon ferrochromium from various types of chrome ore raw materials, both domestic (Saranov, Ray-Iz, Alapaevskoye, Verblyuzhegorskoe), and foreign deposits (Kazakhstan, India, Turkey, Albania) were modeled.

In the paper the six-component oxide system $MgO-Al_2O_3-SiO_2-CaO-FeO-Cr_2O_3$ were consider, which is the basic for the production of high-carbon grades of chromium-containing ferroalloys. It is shown that the resulting slag melts contain, by mass. %: 10-30 SiO_2; 40-60 MgO; 10-45 Al_2O_3; 0.4-6.0 CaO; 2-8 Cr_2O_3; 1-4 FeO. Currently supplied for processing by Russian ferroalloy enterprises chromium ore can divided into MgO/Al_2O_3 (aluminous and high-magnesian)

The dependence viscosity of oxide melts on additions SiO_2 and the ratio MgO/Al_2O_3 was studied. It is shown that oxide melts containing 23-30% SiO_2 with an MgO/Al_2O_3 ratio of 1.5-2.5 are characterized by rational values of the viscosity (0.3-0.7 Pa·s).

It is established that in modern conditions choice ratio of magnesian and aluminous chrome ore from various deposites was most suitable way to regulate the composition of slags high-carbon ferrochromium, and when required addition silicon-containing flux materials This way ensuring ratio MgO/Al_2O_3 = 1.5-2.5.

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