

The isothermal section of diagram composition – $\lg P_{O_2}$ – temperature of the system Fe–Si–O at the temperature 1373 K

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Abstract

State diagram of composition – temperature – properties is the detailed description existence of substances. It allow you to determine how to synthesize the compounds of a given composition, to judge what transformations are possible in the system in certain conditions, what is the composition of the products at each stage of transformation and what properties these products has.

The iron silicate Fe_2SiO_4 – fayalite – is not often a naturally occurring mineral, but a component of a number of manmade products, such as slag smelting of sulphide copper concentrates. In the process of dressing of polymetallic copper and zinc ores in the blade takes the intermediate product, which is based on the mineral fayalite. The possibility of processing such raw materials are determine by the properties of its constituent compounds. It is important to know not only their chemical and mineralogical composition and behavior in terms of pyro - or hydrometallurgical processing. As a basis raw material is fayalite and possible it solutions, the interesting properties of this substance.

In this work, using the EMF method, were investigated phase equilibrium in the system of Fe– Fe_2O_3 – SiO_2 at the temperature 1373 K. The EMF was measured in a cell with a solid oxygen conducting electrolyte: – Pt, Fe, FeO | $ZrO_2 + Y_2O_3$ | $Fe_{1-c}Si_cO_y$, Pt⁺ with investigated samples, the gross composition of which is expressed by the formula $Fe_{1-c}Si_cO_y$. Standard electrode was equilibrium mixture iron and wustite. The pressure of oxygen was calculated from Nernst's equation. Given the temperature dependence of the EMF of these elements.

The isothermal section was plotted at temperature 1373 K, by extrapolation of experimental data.

References

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