completion of the process and cooling of the products is impossible. The rates of chemical processes are determined by kinetic laws that depend on temperature and diffusion factors.

The processing efficiency is determined by the time parameters of the processing process and the thermophysical characteristics of the charge. It has been experimentally established that with increasing saturation temperature and increasing the duration of isothermal exposure, the thickness of the diffusion layer increases.

Conclusions. Tests of SHS coatings for corrosion resistance showed an increase of 1.6-1.8 times this indicator, compared with diffusion coatings obtained under isothermal conditions.

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FORMATION OF DOPED MOLYBDENUM COATINGS IN THE SHS

Introduction One of the main, widely known and most promising ways to strengthen the surface of steel products is chemical heat treatment (CHT). Currently, the technology of strengthening the surfaces of parts working in conditions of constant friction and high temperatures due to coatings of solid chromium, iron, nickel, copper, zinc and other metals and alloys, while the most promising method of increasing heat resistance and corrosion resistance of parts is molybdenum coatings. The introduction of molybdenum in the composition of steels significantly increases their corrosion resistance and, more importantly, resistance to the most dangerous local types of corrosion.

To obtain wear-resistant molybdenum coatings for parts which operating in aggressive environments with high temperatures and in conditions of self-propagating high-temperature synthesis (SHS) [1,2]. SHS is a high-intensity exothermic interaction of chemical elements in the condensed phase, capable of involuntary propagation in the form of a combustion wave.

The aim of this work The main purpose of the work is to obtain legovapnyh molybdenum coatings in the SHS.

Research materials.

For the application of molybdenum coatings used samples of iron of technical purity and steel for mass use (steel 20, steel 45, U8).

Chemical-thermal treatment of carbon steels was carried out in an open type reactor in the operating temperature range of 1100 – 1200 ºC with an isothermal exposure time of 30 – 60 minutes.

The thickness of the hardened layers was studied using a Neophot – 21 and Neophot – 32 light microscope with an increase of ×150 – ×500. The microstructure was detected by etching in a 3 % alcoholic solution of picric acid (TU 6-09-08-317-80). To identify the grain boundaries of ferrite, a 4% alcohol solution of nitric acid was used.

The elemental composition was studied by X-ray microanalysis using a JEOL Superprob-733 microanalyzer. To calculate the equilibrium composition of the system products, the applied software packages "ASTRA 4" and "TERRA" were used [3].

Research results and discussion. Molybdenosilication was performed in the combustion mode in the optimal SHS mixture containing Mo, cholesterol,, i2. Increasing the cooling rate of the reactor greater than Bi = 3 does not allow to obtain a protective layer, due to the low diffusion mobility of molybdenum and silicon, as well as the short period of time during which the surface is saturated with molybdenum and silicon.

The introduction into the mixture of more than 3% of the gas transport agent leads to a strong etching of the sample surface. The study of the microstructure of molybdenosilized coatings showed that a homogeneous layer is formed, which is a solid solution of molybdenum in iron. As a result of X-ray spectral microanalysis, it was found that the content of molybdenum on the surface is 56.4-57.9% and silicon 5.2-5.9%.

Obtaining chromo-titanium coatings under conditions of self-propagating high-temperature synthesis.

Conclusions. Analysis of coatings for corrosion resistance in 30% aqueous solutions of HNO3, H2SO4, HCl showed an increase in this indicator by 1.5-1.8 times compared to diffusion coatings obtained under isothermal conditions.

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OBTAINING DOPED MOLYBDENUM COATINGS UNDER CONDITIONS OF SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS

Introduction An effective method for increasing the durability of various parts, as a result of which the chemical composition, structure and properties of the surface layers of the metal change, is diffusion siliconizing. The production of siliconized coatings under conditions of self-propagating high-temperature synthesis (SHS) is not well understood. Siliconized coatings of steels and alloys obtained by the method of self-propagating high-temperature synthesis can significantly increase wear resistance, corrosion resistance, and heat resistance, and, often, obtain the required combinations. [1, 2].

The aim of this work The aim of this work is to obtain silicified diffusion coatings under conditions of self-propagating high-temperature synthesis

Research materials.

The thickness of the hardened layers was studied using a Neophot – 21 and Neophot – 32 light microscope with an increase of ×150 – ×500. The microstructure was detected by etching in a 3 % alcoholic solution of picric acid (TU 6-09-08-317-80). To identify the grain boundaries of ferrite, a 4% alcohol solution of nitric acid was used.

The elemental composition was studied by X-ray microanalysis using a JEOL Superprob-733 microanalyzer. To calculate the equilibrium composition of the system products, the applied software packages “ASTRA 4” and “TERRA” were used [3].

Research results and discussion. Titanochromoaluminosilication in the combustion mode was carried out in the optimal SHS - a mixture containing XC, Ti, Si, I2.An increase in the