# CORROSION RESISTANCE OF COATINGS PRODUCED UNDER SHS CONDITIONS

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Among the technological processes an important place is occupied by technologies of saturation of the surface layer of steels with aluminum, chromium and silicon. However, it should be noted that this technology has a number of significant disadvantages, which include energy consumption, high duration of processing and in some cases the inability to obtain coatings with a high content of several saturating elements in the surface layer. high-temperature synthesis, largely devoid of these disadvantages and allows to obtain coatings with limited or minimal time of their formation. To increase corrosion resistance requires a coating containing elements that form passive films [1]. When tested in 15 % aqueous hydrochloric acid, the best resistance is shown by allylated coatings doped with chromium and titanium, having the following weight loss: 22.4 and 20.5 g/m$^2$.

The obtained dependences) of the corrosion rate on the test time prove that in acids there is a passivation of coatings in contrast to unprotected carbon steel. The most aggressive medium of these acids is nitric acid. The protective effect of the experimental coatings reaches 95.19÷97.05 % in sulfuric acid, 92.72÷94.34 % in nitric acid and 93.12÷95.26 % in hydrochloric acid.

Comparative analysis of the corrosion resistance of protective SHS coatings and obtained in the isothermal conditions of HTO, shows that they have a weight loss of 1.9÷2.2 times less environments. It is also possible to assume the effect of electrochemical inhibition of anodic dissolution of metals at higher concentrations of alloying elements of doped AP in comparison with coatings obtained in isothermal conditions, which indicates the absence of microcracking.

It is known that mechanical stresses (in this case compressive residual stresses affect the corrosion behavior of metals due to the production of additional energy by the structural material due to the fact that the level of residual stresses in coatings obtained under thermal self-ignition SHS-charge is higher. The probability of microcracking of passive oxide films, which leads to increased corrosion resistance.

A comparative analysis of the corrosion resistance of protective SHS coatings and those obtained under isothermal conditions of chemical-thermal treatment shows that they have a weight loss of 1.9÷2.2 times less.

**References**

1. Sereda I.V., Kruglyak I.V., Gaidaenko A.S., Nesterenko S.V., Bannikov S.V., Sereda D.B. Investigation. Collection of scientific works of DDTU. 2019. – № 1 (34). – P. 54–59.