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Modern Methods of Corrosion of Car Details and Their Protection

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ABSTRACT
This article is written about the corrosion of metals and non-metal contructions, the protection of Automobile details from corrosion, the reasons for their origin, the modern traditional ways of corrosion and erosion differences.

KEYWORDS: *corrosion, erosion, degradation, metal, steel, emall, texture, resistance, material, mechanical forces, gas corrosion, atmospheric corrosion*

INTRODUCTION

Metals and their alloys have high strength and elasticity, mechanical resistance, thermal and electrical conductivity. They have high molding properties, and also allows the use of payvandand for recycling by various methods and in the production of oversized products and structures. Therefore, today metals are the main materials and are widely used in various fields of Science and technology.

At the same time, materials that work under the influence of various physical and mechanical factors begin to disintegrate.

The main types of decomposition of structural materials are as follows:

Mechanical wear is a gloss as a result of the processes of elastic or plastic deformation of the metal. Such degradation breaks down the structure, but often allows to preserve the building material, for example, rusty steel alloys can be melted in Maarten furnaces**.**

Erosion of the material is the gradual destruction of the material by mechanical forces and resistances. An example of the erosion process is the destruction of the wheels of the railway transporti and railway transporti, the forces of the bearings and piston rings, the destruction of the Blades of the turboreactive motor.

Corrosion of material is a process of gradual physical and chemical destruction of metal under the influence of the environment. Unlike mechanical degradation, erosion and corrosion phenomena are damaged to the extent that the structure and oxides of the affected metal are often irreversible. Any building material can lead to corrosion or erosive process. For example, concrete, erosion and building stones, glass, etc.can be called corrosion.

Corrosion is the most common type of loss because it goes where metals are processed or where metal structures are exploited. Therefore, the study of corrosion processes and the development of effective and economic methods of protecting metal structures is one of the most important problems of the national economy.

The ability of metals to withstand the corrosive effects of the external environment is called corrosion resistance.

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By type of aggressive environment, the following types of corrosion are distinguished.

1. Gas corrosion is the corrosion of metals in the absence of condensation of moisture on the surface. As a rule, this species refers to corrosion of metals in gases at high temperatures (for example, oxidation of metals when heated).
2. Noelectrolyte corrosion-refers to cases of exposure to metal aggressive organic liquid substances that do not have significant electrical conductivity (for example, iron corrosion in sulfur-containing oil varieties in high temperatures, steel corrosion in gasoline).
3. Electrolyte corrosion is the corrosion of metals that conduct electric current in liquid environments (natural waters and various aqueous solutions). Depending on the chemical nature of the environment, it is divided into acidic, hydrochloric, salt, sea corrosion. Under the conditions of the influence of the active environment on the metal surface, this type of corrosion will have such additional properties: corrosion with complete deposition, corrosion with complete deposition or corrosion on the water surface, variable corrosion, corrosion on a quiet electrolyte, corrosion during spacing, etc.
4. Sand, soil or underground corrosion is the result of exposure to soil or soil metal. An example of such corrosion is corrosion of pipes laid on the ground or metal columns of high-voltage power lines.
5. Atmospheric corrosion is the corrosion of metals in the natural atmosphere, as well as corrosion that occurs in any wet gas conditions. This is the most common type of corrosion, since most metal structures work under atmospheric conditions.
6. Electrocorrosy is a corrosion of metals that occurs under the influence of electron currents. An example of such corrosion is the rusting of a pipe embedded in the soil.

7. Corrosion with external current - electrochemical corrosion of metals under the influence of a current from an external source (for example, the degradation of the Iron anodine soils of the cathode protection of the underground pipe).
8. Structural corrosion is a corrosion caused by structural heterogeneity of the metal (for example, acceleration of the corrosion process with cathode compounds in H2SO4 or HCl solutions: steel carbide, graphite in cast iron, etc.).
9. Contact corrosion-electrochemical corrosion is the corrosion of aluminum alloys seawater parts in contact with copper parts (for example, in relation to the potential of the base metal(usually more positive), which has other electrochemical potential, caused by contact with the metal, in the construction.
10. Ingrown corrosion-corrosion of metals with electrolytes in small gaps and cracks (for example, in threaded and flanged compounds of steel structures located in water).

RESULTS

Currently, non-metallic protective coatings are widely used in the practice of protecting against gas corrosion. The most promising types of these coatings are heat-resistant enamel and other ceramic compositions.

Glass enamels, glass coatings, porcelain enamels are types of silicate coatings that have different kengayish coefficients. Enamels with a low melting point (borax, soda, potassium, fluoride salts, etc.) – substances (sand, chalk, loy, feldspar, etc.).) is prepared on the basis of. In addition to glass-forming substances, chromium, titanium, zinc oxides are included in the composition, which imparts heat resistance, adhesion to metal, and the necessary decorative properties of enamel, first of all, dyeing.

These coatings provide high diffusion resistance and heat resistance of steel and increase the minimum amount of oxides of PbO, Na2O, CaO etc., their composition is achieved by introducing the maximum number of oxides of Cr2O3, A12O3, TiO2, ZnO, SiO2 and others and they have high protective properties against gas corrosion.

The high chemical resistance of enamels is due to the presence of burrs and silicates, heat resistance is ensured by the proximity of temperature coefficients of the linear kengay of the coating and metal.

Enamel coating is sprinkled with metal surface. The powder-shaped plaster is applied to the prepared metal surface, and then it is softened and tightly adhered to the surface.

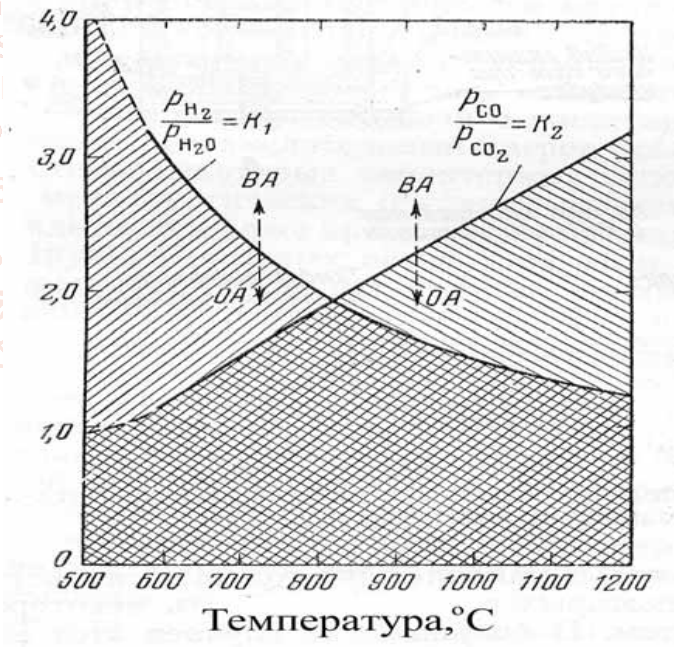
For example, Ukrainimximmash (G. Consider the technology of coating from the heat-resistant enamel EJ-1000, developed by Kharkov).

(16,0 kg quartz sand, 4,5 kg N3VO3, 22,6 kg N3VO3, 2,8 kg Saso3, 1,2 kg TiO2, 2,0 kg ZnO), melt in a gas oven at 2°C for 1400 hours, then grind the frozen glass mass in a ball mill. If 70% parts of this mass are grinding 30% parts Sg2o3, 5% parts (or 2,5 part of bentonite), 50% parts of water are added. The resulting water suspension (shliker) is applied to the previously cleaned steel pieces to the spray parts, mixed with the fixture. The enamel scale applied to the metal is dried and then burned for a few minutes at 1020-1040 °C. the resulting enamel is designed to protect the iron parts from oxidation in the gas environment at a temperature of up to 1000 °C.

DISCUSSIONS

It is very effective in thermal processing of steel products from the protective atmosphere. In the Prevention of corrosion from harmful slag for labor and work operations, a large saving of metal is achieved, reducing costs and increasing the quality of production (for example, the strength and durability of the parts increased by 15 – 30%). Protective atmosphere for steel parts does not cause oxidation, carbonization and flooding of the surface of the product. The composition of such an atmosphere can be considered either from the equilibrium states of gas atmospheres with steel, or from curved lines.

As a result of the interaction of iron with uglerod oxide, a balance of Fe(t) + CO2(g) and FeO(t) + CO(g) is established. At a temperature of 900 0C, the equilibrium equation of this reaction is K = RSO/RSO2 = 2,2. equal to. Usually equilibrium constants determine the dependence of equilibrium states of corresponding reactions from temperature. In our case, the partial pressure of the gas phase, which disappears as a result of a constant oxidation reaction, is expressed in the ratio of the partial pressure of the gas phase to the partial pressure. Proceeding from this, RSO / RSO2 > 2,2. with the ratio of initial concentrations, the equilibrium in the system is silenced to the chap, and the recovery of iron oxide and not iron oxidation. With the initial concentrations ratio of CO and CO2, the RSO/RSO2 < 2,2 reaction balance is silenced to the right and the iron is oxidized.



1-picture. Effect of temperature reactions on equilibrium constant

Fe + H2O = FeO + H2 and Fe + CO2 = FeO + CO:

OA - oxidative environment; and-reducing environment.

CONCLUSION

The importance of corrosion research is determined in three ways.

The first aspect is economic. It is designed to reduce material losses resulting from corrosion of pipes, tanklar (boiler), machine parts, ships, bridges, marine structures, equipment Hydro-, heat and nuclear stations, etc.

Secondly, to increase the reliability of equipment, which as a result of corrosion can lead to negative consequences for production processes, workers and the environment. Examples of such equipment are high-pressure vessels, metal containers for toxic materials, turbine blades and rotors, bridges, aircraft and rocket parts, Energy Devices and reactors. Reliability is an important condition in the development of nuclear power plant (AES) equipment and radioactive waste disposal systems.

The third aspect is the safety of the metal fund. The World Resources of metals are limited, so the production of new metals to replace what is lost as a result of corrosion leads, first of all, to a decrease in the reserves of metal ruda and to additional energy and water costs.

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