

NON-OXIDE PASSIVATION OF CARBON STEEL, COATED HYDROCARBON FILM, IN NEUTRAL CHLORIDE SOLUTIONS

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The cathodic and anodic polarization of steel electrodes covered by thin films of compositions containing a 10 wt.% mixture of amines of hydrogenated acids of tall oil or individual $C_{16}H_{33}NH_2$ amine in $n-C_{15}H_{32}$ or $n-C_{10}H_{22}$ has been studied in 0.5 M NaCl solution. At the polarization from the cathodic region (from $E = -0,5$ B) to the anodic one, a potential range is observed where the electrode process rate does not depend on the potential ($i_j \neq f(E)$). This potential range spreads in both directions from the corrosion potential and is interpreted as the non-oxide passivity region. At cathode potentials, the electrode reaction is the reduction of dissolved O_2 , and at anodic potentials, the ionization of iron occurs. When a certain anodic potential is reached, the section with $i_j \neq f(E)$ goes into the region characteristic of the l_{gi} , E_a dependence, corresponding to the requirements of electrochemical kinetics. When polarized in the opposite direction, the section with $i_j \neq f(E)$ disappears or narrows considerably. If, while reaching a polarization potential of -0.5 V, the electrode is held for 30 minutes or 1 hour, then with subsequent polarization from the cathode to the anode region, the section with $i_j \neq f(E)$ is observed again.

The observed phenomena indicate the adsorption of amines on the active centers of the steel surface from the hydrocarbon film at $E = -0.5$ V, which, with subsequent polarization in the anodic direction, slows down the cathodic reaction of oxygen reduction and the anodic reaction of iron ionization.

The phenomenon under consideration is important for practice, since its presence in the cathode region, together with methods of cathode protection, will increase its effectiveness. In the anode region, it is possible to use such compositions together with the anodic protection of passivating metals and even in its place. In the anode region, it is possible to use such compounds together with the anodic protection of passivating metals and even in its place. This phenomenon is of particular interest in the presence of hydrogen sulfide and ammonia in the atmosphere. These substances dissolve in the surface film of moisture and penetrate into the hydrocarbon coating.

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