

DIAGNOSIS OF BIOCORROSION POROCESS BY A SENSOR-PROBE

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Economic and environmental damage from corrosion of metal products, equipment and structures is almost impossible to estimate. In the US the annual cost of corrosion amount to more than \$ 300 billion. An important role in the prevention of biocorrosion takes its monitoring methods.

One of the modern methods of local corrosion monitoring is based on the patent [1], to determine the effectiveness of the corrosion protection by monitoring the corrosion rate of the built-in sensor three steel indicators of different diameters. There is also an indicator DC-1C [2], based on a change of electrical resistance of a metallic conductor with decreasing cross section due to corrosion. The disadvantage of both methods is the necessity to manufacture sensors of the same material as the controlled structure. That is, if you need to control the number of close packed structures made of different materials, it is necessary to lay under each corresponding sensors.

In this paper the authors as corrosion sensor used electrodes of tantalum and the copper wire at the end of which the pellets were formed [3] with an oxide layer of varying thickness. Its advantage over analogs discussed above is the versatility in relation to the test material. Controlled no feedback corrosion, but one of the main criteria for the activity of bacteria. Such criteria of corrosion degree is the pH of the environment and the activity of the enzyme dehydrogenase. PH measurement region chosen in the vicinity of the corroding surface, since during the life of the bacteria causing biological corrosion, secrete acid among other metabolic products. Control dehydrogenase activity was also determined by staining agar environment with 2,3,5 - triphenyl tetrazolium chloride (TTC), as well as discoloration of methylene blue solution.

Dietary studies sensor probe and soil sampling for laboratory tests carried out in the field multiple excavation water mains in Odessa. Comparison of the results of measurements showed that the selected method of forming the geometry and composition of the surface of the probe allows to determine the degree of development of biological corrosion.

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3. Патент України 80681. «Спосіб формування шарика на кінці дроту» від 10.06.2013. Семенов К.І.