

## Nanodimensional metal manganates (Iv) in the protection coatings

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### Abstract

© 2018, International Multidisciplinary Scientific Geoconference. All rights reserved. A technical progress in various fields of the national economy is accompanied by escalating aggression of the environment that complicates the protection of different objects made from steel, which is the main modern constructional material. Because of the corrosion attack, 50 million tons of metal is oxidized and lost almost forever every year for a mankind. In industrialized countries, annually average losses from corrosion equal to 3-5% from the gross domestic product. The damage from corrosion comprises not only from the cost of materials, but also from costs of production of the decayed constructions, equipment, and various products. At the same time, there is a market competition, which requires paying special attention to an external esthetic design of products. The most effective solution of these and some other special tasks is an application of protective and decorative coatings on their surfaces. Important component of protective coatings, which role is played, as a rule, by anticorrosive primers are the inhibiting pigments. Their nature, characteristics and content in many respects define ability of a coating to suppress metal corrosion. The highest anticorrosive efficiency among currently used pigments of this type are the compounds containing chrome in the highest oxidation state. The drawback of the high inhibiting ability of the chrome containing pigments is their ecotoxicity connected to a long circulation in the environment. As a result, in many developed countries the use of pigments of this type is forbidden at the legislative level (The directive of the EU No. 2000/53/EU allows to cover vehicles only with two grams of hexavalent chrome). It makes a problem of replacement of the chrome containing pigments a priority in the field of paint and varnish technology, and its resolving is strongly recommended. The corrosion tests of coatings containing nanodimensional metal manganates (IV) are given in the work. Pathway of their receiving by a method of covalent assembly in the water environment in the presence of a stabilizing additive is described. Inhibition process of a steel surface in 3% water solution of sodium chloride is studied. The surface of steel is investigated according to the data from X-ray microscopy photos with a confirmation of the chemical composition of protective films in the metal surface. The efficiency of protective properties of polymeric compositions based on a styrene-acrylic copolymer filled with synthesized manganate nanoparticles is presented.

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### Keywords

Anticorrosive pigments, Electrochemical tests, Nanodimensional metal manganates (IV)

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