

The spatially separated process of the formation of nanosized iron–oxygen structures on the steel surface contacting with water dispersion medium. / O. M. Lavrynenko. / Nano Studies. – 2015. – # 11. – pp. 177-190. – eng.

The study of the process of the iron–oxygen nanoparticle formation on the steel surface alternately contacting with water dispersion medium and air has been significantly expanded with complex usage of the scanning electron microscopy data together with the analysis of the electrochemical processes in the local anodal and cathodal areas. The acidic local pH value in the anodal areas and the presence of ferrous iron that is catalytically active with respect to iron–oxygen mineral phases lead to the formation of the well ordered needle- or rod-like goethite particles via dissolution-re-precipitation process. The alkaline medium in the cathodal areas and oxygen depolarization causes the formation and solid-state oxidation of Green Rust particles accompanied by the obtaining of randomly oriented plate-like Fe(III)–Green Rust and lepidocrocite particles. Fig. 7, Ref. 36.

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