

The effect of chemical composition of acidic activators contacting with carbon steel on development of layered double hydroxides on its surface. / O. M. Lavrynenko, B. G. Shabalin, Yu. S. Shchukin, O. Yu. Pavlenko. / Nano Studies. – 2015. – # 12. – pp. 119-132. – eng.

The effect of acidic activator solutions on the formation of Fe(II)–Fe(III) layered double hydroxides and their phase transformation on the carbon steel surface was studied applying a complex physical investigation including an X-ray diffraction method, thermal analytical measurements and scanning electron microscopy (SEM). According to experimental data the main product of the phase transformation process in H₂SO₄ system was magnetite with an insignificant admixture of ferric oxyhydroxides, but the usage of HCl, HNO₃, and CH₃COOH acids led to predominant obtaining of lepidocrocite with relatively small amount of magnetite. Whereas the hydroxysulfate Green Rust II was determined as a primary mineral phase in the first case (H₂SO₄), only hydroxycarbonate Green Rust I structures were present in SEM images in the second case (HCl, HNO₃, and CH₃COOH). For the purposeful obtaining of GR(Cl⁻), GR(NO₃⁻), GR(CH₃COO⁻) structures on the carbon steel surface the phase formation process must be carried out in an inert atmosphere. Fig. 3, Tab. 3, Ref. 50.

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