

## ABSTRACT

**Practice report:** 75 pages, 27 figures, 13 tables, 35 literatures.

**The aim of the study:** to investigate the microstructure, phase composition and microhardness of the surface layers of steel mark-3 and mark-50 after the complex treatment – electric–spark alloying with chromium, titanium and nickel subsequent ion-plasma nitriding.

**The object of the study:** the formation of structure and phase composition of surface layers on alloys of iron after the electric-spark alloying (Cr, Ti, Ni) in the interelectrode environments and ion-plasma nitriding.

**The methods of the study:** gravimetric, microstructural, X- ray and microhardness analysis.

**Practical use:** the results are of practical importance for the development of new models of electric–spark alloying to enhance surface of steel products. Developed model of electric–spark alloying can improve physical and mechanical properties of steel mark-3 and mark-50, which allows its use in conditions of sliding friction.

ELECTRIC-SPARK ALLOYING, ION-PLASMA NITRIDING,  
CHROMIUM,TITANIUM, NICKEL, STEEL MARK-3, STEEL MARK-50,  
STRUCTURE, MICROHARDNESS, COATINGS, ALLOYED LAYER.