

ABSTRACT

Thesis: 71 pages, 25 figures, 11 tables, 43 literatures.

The aim of the study: to investigate the microstructure, phase composition and microhardness of the surface layers of steel 45 after the gradual electric-spark alloying with titanium and zirconium in the interelectrode environments argon, nitrogen and air.

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

Subject of the study: strengthened surface layers of iron alloys after electro-spark alloying in the gradual interelectrode environments argon, nitrogen and air alloying titanium and zirconium anode using various alloying schemes.

Scientific novelty: first found that the deposition sequence of titanium and zirconium to electric-spark alloying of Steel 45 under an argon, nitrogen and air atmosphere leads to the formation of coatings increased to 7,7-27 GPa microhardness due to the presence of complex carbide layer doped TiZrC_2 , formed by the interaction metal anodes with carbon steel.

Practical use: doped layers received in the serial electric-spark alloying Ti- and Zr-anodes using new technological methods of processing have sufficient thickness and high microhardness, which provides the ability to use them for processing parts operating under contact stresses.

ELECTRIC-SPARK ALLOYING, TITANIUM, ZIRCONIUM, ARGON, NITROGEN, STEEL 45, STRUCTURE, MICROHARDNESS, COATINGS, ALLOYED LAYER