SEAE 45P STRUCTURAL CHANGES IN THE SURFACE LAYERS TITANIUM, ELECTRO-SPARK ALLOYING ELECTRODES MADE OF GRAPHITE

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The phase-structural transformations have been investigated in titanium surface layers after electro-spark alloying (ESA) by graphite electrode. Titanium samples measuring 15x15x4 mm have been made of commercially clean titanium sheet. Its brand is BT1-0. The graphite rod of brand C-3 of 6 × 200 TU 16-538-019-69, being 40 mm at length and 6.0 mm in its diameter have been used as an anode (machining electrode). ESA process has been carried out in the energy range of W values of electrical discharges varying from 0.3 up to 3.0 J.

X-Ray diffractometric examination of samples after the electro-spark alloying by titanium carbon within the discharge energy modes of 0.3 J and 3.0 J have been performed at λCuKα - radiation. It has been stated that the phase processes on the surface with TiC formation occur faster at ~ 1/3 under identical conditions of shooting and under the energy discharge of 3.0 J (fig. 1). In both cases, TiC is the dominant phase on the electric-formed hardening surface. In the sample, after discharge electro-spark energy when W = 0.3 J, Ti phase has been represented substantially on the surface diffractometry spectrum as a satellite phase. Phase Ti is less pronounced in the sample after ESA with W = 3.0 J, because of the fact that the proportion of the titanium carbide has increased on the surface. But in this case α - C- graphite is presented in the surface layer, which indicates on more intensive transfer of anodic material (graphite) at ESA.

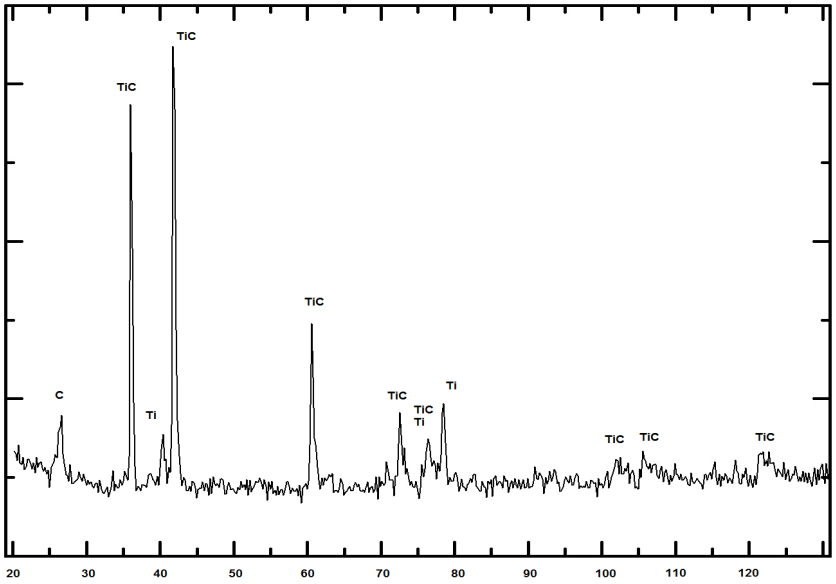

Fig. 1. Phase composition of the sample surface after electro-spark alloying with graphite electrode at an energy level 3.0 J

The results showed the possibility of obtaining the carbide phases in electro-spark alloying, therefore the effectiveness of the method of electro-spark alloying to modify the structural alloys surface.

Acknowledgments: This study was founded from Moldavian national project CSSDT 15.817.02.05A “Physico-chemical methods and engineering aspects of new materials and surfaces obtaining for multiscale technologies”