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Editors: A. Dlouhý, L. Kunz



Institute of Physics of Materials,
Academy of Sciences of the Czech Republic

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Intensive formation of intermetallic phases under ions implantation by aluminum of titanium target

A. V. Niconenko¹, N. A. Popova², I. A. Kurzina¹, E. L. Niconenko²,
E. V. Kozlov²

1: Tomsk State University, Russia

2: Tomsk State University of Architecture and Building, Russia

The results of investigation of the microstructure and phase composition of titanium samples with different grain size (0.3 μm , 1.5 μm , 17 μm) implanted by aluminum ions (dose is 1×10^{18} ions cm^{-2}) using Mevva - V source (RU). It is established that polyphase implanted layers on the basis of α -titanium grains is formed as a result of ion irradiation. The size, shape and localization of the secondary phases (TiO_2 , Ti_2O , TiC , Ti_3Al , Al_3Ti) depends on the grain size of the titanium matrix. It was found that the separation of nanoscale TiO_2 grains was observed mainly at dislocations in the bulk of the matrix grains. Formation of Ti_2O was observed by a big regions on titan surface with mezo polycrystalline grains (17 μm). It was established that the ordered Ti_3Al phase was formed at a depth more than 200 nm of the implanted layer on the grain boundaries of a titanium target.