MECHANICAL PROPERTIES OF TI ALLOYS AND AUTOMATED SYSTEM OF ANISOTROPY VISUALIZATION

ONANKO Anatoliy Petrovich, PRODAYVODA G.T., ONANKO Y.A., SHABATURA A.V., ONANKO G.G., ONISCHENKO A.N.

Kyiv National University, Physical department, Kyiv, Ukraine

Abstract

Ti alloys as biocompatible are widely used in prosthetics and in implantology. The Puasson coefficient μ is equal to ratio of relative transversal compression to relative longitudinal lengthening. Debye model sets the conditions existence stand waves in solid state. The quantum nature of elementary oscillators takes into consideration. Therefore waves, that elementary oscillators excite, can't carry the energy. There are stand waves. One oscillator produce 3 waves: 1 longitudinal and 2 transversal. Debye temperature was determined after the formula with Bol'cman constant, Plank constant, Avogadro number, middle gram-molecular mass, density, longitudinal US velocity, transversal US velocity. Temperature dependence of internal friction Q-1(T) and elastic module E(T) (directional of inelastic-elastic body) and 2D, 3D AFM microstructure of VT3 Ti alloy after mechanical and thermal treatment is represented.

Thus, the measuring of IF background Q-10 after different heat, mechanical, radiation treatments gives information about the changing of the thermoelastic strains fields σi in Ti alloys. The growth of heights IF maximums QM-1 testifies the growth of structural defects concentration, and the broadening of IF maximums ΔQM-1 here represents the relaxation process of structural defects new types in Ti alloys. The correlation between elastic module E, pressure P and temperature T may be presented az surface ("directional surface of elasticity body") before and after satiation.

Keywords: Elastic module, internal friction, mechanical, thermal treatment

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