Properties of cast Ti-Nb-Sn alloys

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ABSTRACT

This present work is a study of TNS alloy microstructure, mechanical properties and shape memory effect, and to compare them with TN alloy, which were cast using a good mechanical properties of titanium alloy with shape memory effect. A series of TNS to dental casting alloy melting and casting machine, followed by use of electron microscopy to observe the microstructure and X-ray diffraction analysis of its composition, using the universal testing instrument measure the mechanical properties and to study the shape memory effect after final heat treatment. The results showed that TN and TNS-A ~ TNS-C alloy composition of the phase α" phase, TNS-D ~ TNS-J Sn alloy phase composition of the β phase. In bending strength, TNS-A alloy increased by 7%, while the TNS-E alloy decreased by 50%；In hardness, TNS-J alloy increased 14%, while the TNS-E alloy decreased by 12%. In elastic modulus, TNS-J alloy increased by 32%, while the TNS-E alloy decreased by 42%. In the elastic recovery angle, a series of TNS alloy are lower, in which TNS-C alloy increased by 74%. In shape memory effect, TNS-G alloy increased by 90%, but TNS-B 、TNS-C、TNS-I and TNS-J alloy does not exhibit shape memory effect.

Keywords : Titanium alloy、Structure、Mechanical property、Shape memory effect、 α " phase、 β phase

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