Previous studies have shown that the addition of Fe in Ti alloys produces an increase in the mechanical properties of the alloy while maintaining low modulus of elasticity as well as it has been reported as a strong stabilizer of the ? phase. In the present work was developed an investigation about a Ti alloy designed for biomedical application. The aim of the investigation was study the effect of addition like dopant element of Fe to understand the existent relation between the structure and mechanical properties of the alloy. The alloys Ti-19Nb-10Zr-1Fe, Ti-18Nb-10Zr-2Fe, Ti-17Nb-10Zr-3Fe, Ti-16Nb-10Zr-4Fe and Ti-15Nb-10Zr-5Fe %at were synthesized using high-purity (99.9%) elemental sources by the arc-melting method under high-purity argón atmosphere. The microstructure and phase of alloys were characterized at room temperature using optical microscopy and X-ray diffraction. The mechanical behavior was evaluated using hardness test. Experimental results indicate that the phase stability and mechanical properties of the alloy can be changed by adding small amounts of Fe. The alloys exhibit a combination of ?+? phase, which can be explained due to the high content of ? stabilizer elements that can retain ? phase to room temperature. The increase of Fe content resulted in increase of the mechanical properties of the alloy.

Keywords: Ti-Nb-Zr-Fe Alloys, Structure, Mechanical Properties

References:


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