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STRUCTURAL AND MICROSTRUCTURAL CHARACTERIZATION OF TI-10Mo-25Zr ALLOYS FOR BIOMEDICAL APPLICATIONS

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Metallic biomaterials are widely used in restorations and substitutions of hard tissues, as in orthopedic prostheses and dental implants. The challenge is to develop biomaterials with appropriate features and properties similar to those of bone tissue. Among the used metals, titanium and its alloys highlight, because by adding substitutional elements to titanium is possible to obtain a combination of properties more advantageous than those obtained with pure titanium. The alloys with body-centered cubic crystalline structure (beta phase), have the possibility of combining high mechanical strength with low elastic modulus. Molybdenum is an excellent beta stabilizer requiring a minimum of 10 wt% to stabilize this phase, and the zirconium can improve the stabilization of this phase in conjunction with other beta stabilizer element, improving the corrosion resistance and biocompatibility of the alloys. Thus, as objective of this work, the Ti-10Mo-25Zr was prepared by arc-melting and characterized by means of density, chemical microanalysis by energy dispersive spectroscopy (EDS) and mapping; x-ray diffraction combined with Rietveld refinement, optical and scanning electronic microscopy; microhardness and elastic modulus, in order to better understand the relationship between structure and properties of alloy, aiming biomedical applications.
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