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Effect of the degree of deformation on the microstructure and properties of Ti10Mo20Nb alloy

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The Beta titanium alloys have been designed for biomedical purposes due to their combination mechanical attributes such as low elastic modulus, superior strength, fatigue resistance, good ductility and excellent corrosion resistance. With this known, the metastable beta titanium Ti-10Mo-20Nb alloy was produced, replacing the already known and traditional Ti-6Al-6V alloy with vanadium due to its biotoxicity that causes cell mortality and Aluminum due to the degeneration of neural cells that causes acceleration of the Alzheimer's process. In this context, the objective of this work was the microstructural and mechanical characterization of Ti-10Mo-20Nb alloy treated at 1000°C for 24 hours followed by cold forging (50% and 80% in area reduction). The Ti-10Mo-20Nb alloy in different conditions was characterized by X-ray diffraction (XRD), optical microscopy (OM) and hardness. The results of the microstructural characterization showed only the presence of monophasic ? metastable in all condition. It was not observed a significant variation in the hardness with the increase of degree the deformation.