308-033

MICROSTRUCTURE, PROPERTIES AND CORROSION RESISTANCE OF HOT SWAGED AND HEAT TREATED Ti-12Mo-8Nb ALLOY FOR ORTHOPEDIC APPLICATIONS

Nunes, A.R.V.(1); Gabriel, S.B.(2); Dos Santos, I.D.(3); Araújo, L.S.(4); Nunes, C.A.(5); De Almeida, L.H.(1);
UFRJ(1); UERJ(2); CENTRO DE PESQUISA DA VALE(3); COPPE/Universidade Federal do Rio de Janeiro(4); Universidade de São Paulo(5); UFRJ(6);

Different beta titanium alloys were developed for biomedical applications, such as orthopedic implants. These alloys combine a low elasticity modulus with high strength, fatigue resistance, good ductility and excellent corrosion resistance, crucial for these applications. Under this perspective, a new metastable beta titanium Ti-12Mo-8Nb alloy was developed by replacing both vanadium and aluminum for molybdenum and niobium from the traditional alloy Ti-6Al-4V. This study therefore analyzes the microstructure, corrosion resistance and mechanical properties of the Ti-12Mo-8Nb alloy after hot forging and heat treatment at 950ºC for 1h and water quenching. The material was characterized by X-ray diffraction and scanning electron microscopy, tensile tests were also carried out at room temperature. Corrosion tests using Ringer's solution to simulate the body fluid, were performed to obtain potentiodynamic polarization curves. The results showed that the new Ti-12Mo-8Nb alloy presented a Beta phase microstructure, good mechanical properties and exhibited a passive layer being therefore potential candidates for orthopedic implants.