

Effect of small additions of beta-stabilizing elements on the phase formation, microstructure and mechanical properties of Ti-25Nb-1X (X = Ta, Mo e Zr) alloys

R. L. Batalha^{1,*,#}, P. Gargarella¹, C. Bolfarini¹, W. J. Botta¹, C. S. Kiminami¹

¹Universidade Federal de São Carlos (UFSCar), Departamento de Engenharia de Materiais (DEMa), Rodovia Washington Luis, km 235, CEP:13565-905, São Carlos, SP, Brasil

#Corresponding author: rodolfo.batalha@ppgcem.ufscar.br

Recent studies have shown the potential of Ti- β alloys with pseudoelastic properties replacing Ni-Ti alloys^[1]. The aim of the present work is to investigate the effect of small additions of beta-stabilizing elements on the phase formation, microstructure and mechanical properties of Ti-25Nb-1X (X = Ta, Mo e Zr, at.%) alloys. These alloys were selected based mainly on best pseudoelastic Ti-Nb alloys and biocompatibility. Pure elements were melted in an arc melter and suction cast in order to produce 3 mm diameter rods and wedge-shaped samples. Microstructural and thermal characterization of ingot, rods and wedge-shaped samples were performed by X-ray diffraction, differential scanning calorimetry, optical microscopy and scanning electron microscopy. Test specimen were cut from the 3 mm diameter rods for compression tests in order to evaluate the mechanical and pseudoelastic properties of these alloys. The phase formation and microstructure, thermal stability and mechanical properties of the three alloys will be compared and discussed during the presentation.

^[1] H. Y. Kim, S. Miyazaki, Mater. Trans.. **56-5**, (2015) 625.