Abstract.

Titanium alloys with β microstructure stand out for their good specific properties, corrosion resistance and its low elastic modulus, making them very suitable as biomaterial implants because they reduce unwanted phenomena known as stress shielding.

There are great difficulties to process this type of alloys but conventional powder metallurgy is listed as one of the best options. Attached to the elemental mixture of powders it takes advantage of the high reactivity titanium has to obtain homogeneous alloys despite the refractory nature of the main betagenous alloying of titanium. But this high reactivity drags out the processing that must take special care not to contaminate or oxidize the material.

This paper has developed a series of β-type titanium alloys processed by powder metallurgy and elemental powder blending. Niobium has been used as main β- stabilizing element alloying and small tin contents have been included to study the influence of this alloy as a third element.

Firstly the processing has been optimized achieving a level of homogeneity and high repeatability. The obtained microstructures have been studied to understand the mechanical behavior of them and their corrosion behavior simulating the stresses required as a biomaterial. It has been placed special emphasis on the determination of the elastic modulus by different methods so as to allow a better approach to the modification thereof by alloying, and all compared with the results obtained by other researchers. The results show that the alloys developed by adding 2 to 4% tin to Ti 30Nb based alloys, and the selected processing technique are an alternative, from the viewpoint of properties, and economically viable.