

Mechanical Properties and Microstructure of High Porosity Ti-6Al-4V by Powder Sintering Process for Biomedical Applications

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Abstract

Due to their excellent mechanical properties, superior biocompatibility, corrosion resistance titanium and its alloys are currently considered as the most important metallic materials for biomedical applications. In the present study, the production of highly porous Ti-6Al-4V parts by powder metallurgical technology is described. A space-holder method used carbamide with different particle size to produce samples with porosities between 30% and 85%. Spherical and angular pores in the range of 50 μm and 400 μm were obtained depending on the shape and size distribution of the space holder. The compressive strength and elastic modulus of porous Ti-6Al-4V were determined. The microstructure of porous materials is given, aiming preferentially at biomedical applications. The porous parts are characterized by using scanning electron microscopy. The results show that this process is promise to fabricate biomaterials for bone implants.