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Doctoral Grant from the Spanish Ministry of Research (MICINN)

<http://www.micinn.es/portal/site/MICINN/menuitem.dbc68b34d11ccb5d52ffeb801432ea0/?vgnnextoid=2d161e84ed136210VgnVCM1000001d04140aRCRD>

to carry out and obtaining a European Ph.D. at the
University of the Basque Country in Bilbao, Spain

Synthesis y Characterization of Shape Memory Alloys at Micro and Nano scale

Introduction

Multifunctional materials are one of the driving motors of the modern technologic development. Among them, Shape Memory Alloys (SMA) exhibit a reversible martensitic transformation conferring them a series of specific thermo-mechanical properties such as superelasticity and shape memory.

Objectives

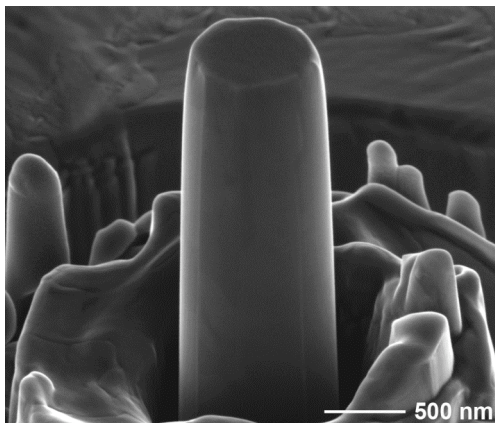
In the frame of the offered Grant to carry out a PhD Doctoral Thesis, the objective is to study the behaviour of the martensitic transformation at micro and nano scale, analysing the influence of the dimensional size. Alloys and micro-nano devices will be produced by thin film techniques and micro-nano lithography, as well as trough milling by focussed ion beam (FIB). Then the microstructure will be characterized by SEM, TEM and AFM. Finally the thermo-mechanical properties of superelasticity and shape memory will be studied by micro and nano compression testing.

Working frame

Our research Group has been pioneer on the study of SMA at Micro and Nano scale [1-2], so the PhD Student will be integrated in a multidisciplinary research group with very large experience on SMA, Electron Microscopy and Mechanical Properties. Some of the experimental studies will be carried out in collaboration with the Massachusetts Institute of Technology (MIT), Cambridge, USA. This way, several stays will be scheduled and financed to temporary do specific research works at the MIT, as well as in other international laboratories.

[1] J. San Juan, M.L. Nó, C.A. Schuh. Superelasticity and Shape Memory in Micro and Nanometer-scale Pillars. *Advanced Materials*, 20 (2008) 272-278.

[2] J. San Juan, M.L. Nó, C.A. Schuh. Nanoscale shape-memory alloys for ultrahigh mechanical damping. *Nature Nanotechnology*, 4 (2009) 415-419.



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Call will be open soon on the Ministry Web:

<http://www.micinn.es>

Reference: Project **MAT2009-1249**

** For their official FPI application, candidates from outside Spain will have to provide a Spanish Ministry approved undergraduate degree or the corresponding receipt of application*