CENIM
Centro Nacional de Investigaciones Metalúrgicas

Current Challenges on Metals Science at CENIM

The purpose of the Young Scientist Meeting Program is to show CENIM research activities from the perspective and the work of our young researchers. In this edition, we have the participation of two invited speakers from the School of Civil Engineering (Technical University of Madrid), a young researcher that have enrolled CENIM as International Internship Visitor, and a member of our Non-Equilibrium Processing Group. They will show their ongoing work on metallic alloys, from the design, production and transformation to the analysis of their final use in different industrial sectors.

Young Scientist Meeting

June 24th, 2014. 09.30h Conference Room – CENIM
Avda. Gregorio del Amo, 8. 28040 Madrid

09.30h : 10.00h

On the use of W-TiC alloys for ITER divertor components

Elena Tejado
E.T.S.I. Caminos, Canales y Puertos, Universidad Politécnica de Madrid, Madrid, Spain
CENIM (CSIC), MANOEQ Research Group, Madrid, Spain

In this investigation, alloys with different content of TiC have been evaluated in a wide temperature range, by means of flexural strength, fracture toughness and hardness measurements. The microstructure and the fracture surfaces of the tested materials were analysed by Field Emission Scanning Electron Microscopy (FESEM). Thus it was possible to determine the relationship between the macroscopic mechanical properties (25 – 1200 ºC in air and vacuum) and the micro mechanisms of failure involved depending on the temperature and the oxides formed.

10.00h : 10.30h

Influence of Ca, Mn and Ce-Rich Mischmetal Additions on the Microstructure and Mechanical Properties of Mg-6Zn-1Y Alloy

Judit Medina Caballero
CENIM (CSIC), MANOEQ Research Group, Madrid, Spain

The effect of Ca, Mn and Ce-rich mischmetal additions on the microstructure and mechanical properties of the extruded Mg-6Zn-1Y (wt. %) alloy has been investigated. The nature and volume fraction of the second phases depended on the alloying element. The mechanical behaviour can be rationalized on the basis of microstructural changes induced by the different elements added to the ternary alloy.

10:30h : 11.00h

Recrystallization behaviour of W- and WVM-foils

Teresa Palacios
E.T.S.I. Caminos, Canales y Puertos, Universidad Politécnica de Madrid, Madrid, Spain

The target of this project is to study the evolution of the recrystallization on annealed foils of technically pure tungsten (W) and potassium doped tungsten (WVM) foils in the temperature range from 800 to 2400 ºC. The research includes three point bending tests, nanoindentation tests and measurement of the micro hardness. In addition, a study of the fracture surfaces via SEM and optical microscopy is performed.

11:00h : 11.30h

Development of super-hydrophobic nickel films by electrodeposition process

Shohreh Khorsand
Isfahan University of Technology, Isfahan, Iran.

A super-hydrophobic nickel film with micro-nano structure was successfully fabricated by electrodeposition process. By controlling electrodeposition parameters, nickel films of different wettability were obtained. The wettability of the nickel film varied from super-hydrophilicity to super-hydrophobicity by exposure the surface in air at room temperature. In the present investigation, the corrosion resistance of super-hydrophobic films is also studied.