EuroSciCon

October 04-06, 2018
Amsterdam, Netherlands

EuroSciCon Conference on
Nanotechnology & Smart Materials

Daria Setman, Nano Res Appl Volume:4
DOI: 10.21767/2471-9838-C6-024

BULK NANOSTRUCTURED MATERIALS PRODUCES BY SEVERE PLASTIC DEFORMATION: SCIENCE AND APPLICATIONS

Daria Setman
University of Vienna, Austria

Bulk nanostructured materials produced by severe plastic deformation (SPD) are materials with nanostructured features, such as nanograins, nonoclusters or nanotwins. These nonstructured materials are fully dense and contamination free and in many cases they have superior mechanical and functional properties. Due to the high hydrostatic pressure during plastic deformation, also very brittle materials can be deformed to infinite deformation degrees. These highly deformed materials have shown highlights in mechanical properties i.e. high strength paired with considerable ductility, as well as superplasticity at high deformation rates, recent research activities increasingly present outstanding SPD functional nanomaterials. Those exhibit advances in radiation damage resistance, electrical conductivity, hydrogen storage and especially thermo electricity where even world records in both p- and n-type semiconductors were broken. This review provides a summary of some of these recent developments. Special emphasis is placed on the use of SPD processing in achieving increased thermo electricity, an improved hydrogen storage capability, materials for use in biomedical applications, and the fabrication of high-strength metal-matrix nanocomposites.

Biography

Daria Setman has completed her PhD in Physics in 2010 at the University of Vienna, Austria. After finishing her own FWF (Austrian Science Fund), prestigious Hertha-Firnberg project, she became a Senior Lecturer at the Faculty of Physics at the University of Vienna. Her main expertise is deformation of materials with high pressure torsion and analysis by differential scanning calorimetry.

daria.setman@univie.ac.at