



Symposium L : Nano-scaled metal-oxides, processes, characterization and applications

Scope of the Symposium

The ever-increasing demand for enhanced material performance and reduction of the use of the same materials demands the exploitation of outstanding materials at a nanoscale, which also requires the exploiting different process technologies. Moreover, a refined microstructure provides improvements in mechanical, chemical, optical, and electrical properties. Due to the outstanding performance of metal-oxides at a nano-scale, they have been attracting a growing exponential interest mainly in novel innovative devices, products and systems cross cutting different application areas, highly challenges for the sustainability of our planet such as energy, water and air pollutant control, health, food industry and electronics interfaces for communication and data transmission. As far as devices and products are concerned, we would highlight its use in transistors, solar cells, diodes, sensors, biosensors, energy converters and storage, photocatalysis, among others. Moreover, nanostructured metal oxides have been also growing its application in controlling the photodegradation of pollutants, reducing dramatically the final cost of wastewater purification. Another aspect is its suitable characterization that is imperative for the development and upgrading of such advanced nanomaterials and devices to access their precise intrinsic assets. However, the characterization of materials is as diverse as the variety of existing nano-scaled metal-oxides and its further applications. Moreover the proper selection of the technology to be used, going from physic methods to chemical methods, impacts on the final properties of the nanostructures obtained, besides being relevant to turn them affordable and green. This symposium is aimed to give an overview on nanostructured metal-oxides and devices with nanoscale or atomic resolution, processing methods to obtain the same as well as to present the recent material characterization techniques used to analyse such nanomaterials. Furthermore, highlight the competences and novelties of the material characterization techniques in order to access and understand the principal material properties and their behaviour. Metal oxide-based nanostructures such as diverse nanoparticles, nanowires, nanorods, nanorings, nanocages will be the main focus of this symposium, together with their wide field of applications.

Abstracts will be solicited in (but not limited to) the following areas

- *Nanostructured metal-oxide materials (TiO₂, ZnO, WO₃, CuXO, SnOX, VOX, Fe₂O₃, and NiO);*
- *Structural, optical and electrical characterization techniques;*
- *Advanced materials for photocatalytic and photoelectrochemical applications, as well as energy production and storage;*
- *The application of photocatalysis for water treatment, disinfection, and air depollution;*
- *CO₂ photoreduction and conversion;*
- *Innovative synthesis techniques;*
- *Upscaling of nanomaterials technologies for energy applications;*
- *New technology trends and applications.*

List of invited speakers

Prof Patricia Carvalho (*Sintef*) **Prof Rita Branquinho** (*Universidade Nova de Lisboa da Faculdade de Cincias e Tecnologia*) **Prof Rodrigo Martins** (*Universidade Nova de Lisboa da Faculdade de Cincias e Tecnologia*) .

Symposium Organizers

Prof. Dra. Daniela Gomes (*CENIMAT/i3N - Universidade Nova de Lisboa da Faculdade de Cincias e Tecnologia*) **Dra. Ana Pimentel** (*CENIMAT/i3N - Universidade Nova de Lisboa da Faculdade de Cincias e Tecnologia*) **Prof. Dra. Patricia Carvalho** (*Sintef*) **Prof. Dr. Sidney Loureno** (*Universidade Tecnolgia Federal do Paran*) .

XIX Brazil MRS Meeting