SYNTHESIS OF NANOPARTICLES

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ABSTRACT

The group of Applied Electrochemistry and Electrocatalysis of the University of Alicante has adquiered an important experience and know-how in synthesizing different types of nanoparticles. The synthesis of the nanoparticles can be carried out using different methods, thus allowing to produce nanoparticles with controlled size, shape and atomic composition. These nanoparticles have a wide number of applications including, fuel cells, heterogeneous catalysts, electrocatalysts, pigments, nanomedicine, etc. In addition, the different nanoparticles can be also dispersed in different supports (carbón based materials, titania, ceria, etc). Consequently, on-demand nanomaterials can be produced for the costumers.

ADVANTAGES AND INNOVATIVE ASPECTS

MAIN ADVANTAGES

- Customization of the process of synthesis, test, scale-up and technology transfer to the company.
- Use of decontaminated protocols for the cleaning of some particles.
- Techniques appropriated for metallic, bimetallic and multimetallic particles. Also applyable to other compounds as SiO_2, CdS, ZnS, ZrO_2, $CaCO_3$, $BaCO_3$, CdSe, TiO_2, etc.

INNOVATIVE ASPECTS

- Possibilities of developing synthesis processes under customer's requirements (sizes / shapes / composition).
- Electrocatalytic properties of nanoparticles are improved as a function of the size, and atomic composition of the nanoparticles.
- Synthesis of new catalyst and electrocatalyst by preferential surface structure / shapes (cubic, tetrahedral, spherical, octahedral, etc).

MARKET APPLICATIONS

The use of nanoparticles could be of interest to:

- Optical, magnetic, catalytic and electrocatalytic properties.
- Sensors.
- Catalysts (supported and unsupported) for batteries, fuel cells, gas diffusion electrodes, etc.
- Ceramic materials.
- Pigments.
- Biological and medical applications.

COLLABORATION SOUGHT

Manufacturers of optical, magnetic, sensors, medical devices, catalysts (for using in batteries, fuel cells, gas diffusion electrodes, etc.), ceramic materials and/or pigments are sought in order to achieve technical cooperation and/or commercial with technical assistance agreements.

In case of technical cooperation: adapting or developing the technology for the sector or market in which the company could be involved and under their requirements.

In case of commercial agreement with technical assistance: training/assisting in set up processes, consulting in new processes, technical training.