

Special Issue on
**Size/Shape-Tailored Multifunctional Noble Metal Based
Nanomaterials with Multiple Applications**

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In the field of catalysis, optical biosensing, and biomedical applications, the size/shape-tuning of the used metal micro/nanoparticles is a potent tool to manipulate the properties considering a given application (catalytic/photocatalytic H₂ production, optical biodetection/bioimaging, and targeted drug delivery). This can be done by directed growth of particles with exposed crystallographic planes which favors the desired reaction, optical/plasmonic properties, and surface chemistry. The knowledge concerning the growth of these entities and the relationship between the desired property, structure, morphology, and size is relatively vast, although there are several large knowledge gaps which should be covered. Therefore, we would like to invite scientific contributions in the form of research and review papers which are focusing on the previously mentioned applications.

Usually, these materials are applied in form of composites with semiconductors or support materials. Therefore, the chemical reactions, electron transfer processes, and adsorption/desorption of different compounds will be determined by the contacts' number and nature between the noble metal nanoparticles and the support. This contact is also dependent on the noble metal nanoparticles' size and geometry.

Optical biosensors based on plasmonic transducers are fast becoming the method of choice in bionanotechnology field owing to their high specificity and sensitivity. They are based on the exploitation of unique optical response of plasmonic nanomaterials, which are determined by their size, shape, and local dielectric environment. Therefore, there is still a growing need to develop novel, stable, reproducible, and improved multifunctional nanomaterial-based hybrid systems with appealing properties.

The noble metal nanoparticles have gained a lot of interest also for important biomedical applications, such as drug delivery and diagnostic and imaging materials. In order to apply these noble metal nanomaterials in clinical field it is necessary to understand how their size/shape influences the interaction with cells that lead to their therapeutic efficacy in appropriate disease model. Similarly, to their use in catalysis field in biomedical applications, these inorganic nanomaterials are mostly used in composites with bioceramics or/and polymers for hard and soft tissue regeneration.

Potential topics include but are not limited to the following:

- ▶ Strategies to obtain shape-tailored (noble) metals: the relationship between synthesis parameters and particle shape
- ▶ Applicability of the shape/size-tailored noble metals in catalytic and photocatalytic processes (H₂ production, etc.)
- ▶ Development of functional plasmonic nanomaterials with controlled optical properties for biomolecular detection
- ▶ Imaging technologies using hybrid and composite nanomaterials
- ▶ Applicability of the noble metals in the engineering and development of biomaterials

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/jnm/sstm/>.

Lead Guest Editor

Zsolt Pap, Institute of Environmental Science and Technology, Szeged, Hungary
pzsolt@chem.u-szeged.hu

Guest Editors

Monica Focsan, Babes-Bolyai University, Cluj-Napoca, Romania
monica.iosin@phys.ubbcluj.ro

Ana-Maria Craciun, Babes-Bolyai University, Cluj-Napoca, Romania
ana.gabudean@ubbcluj.ro

Adriana Vulpoi-Lazar, Babes-Bolyai University, Cluj-Napoca, Romania
adriana.vulpoi@phys.ubbcluj.ro

Klára Magyari, University of Szeged, Szeged, Hungary
klara.magyari@ubbcluj.ro

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