Special Issue

Silica Nanoparticles for Enzyme Immobilization and Biotechnological Applications

Message from the Guest Editors

Silica nanoparticles are valid supports for enzymatic immobilization. Enzymes have a number of advantages as catalysts, such as high selectivity and mild operating conditions, as well as providing a green synthetic route. The need to immobilize enzymes on solid matrices arises from their intrinsic instability. In fact, immobilization allows for the reuse of the heterogeneous catalyst and often stabilizes the conformation of the protein, which is essential for its catalytic function, even when it operates in conditions other than physiological ones. Porous silica allows for enzymes to be hosted within its structure, providing them with greater stability, without the need for covalent links. By modulating the size, morphology and interconnection of the pores, it is possible to obtain the most suitable support for each enzyme, which preserves its functionality and reduces the mass transport limitations of substrates and products.
This Special Issue aims to open a discussion on the possible applications of enzymes immobilized on silica nanoparticles in the industrial sector of biotechnology.

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Nanoscience and nanotechnology are exciting fields of research and development, with wide applications to electronic, optical, and magnetic devices, biology, medicine, energy, and defense. At the heart of these fields are the synthesis, characterization, modeling, and applications of new materials with lower nanometer-scale dimensions, which we call “nanomaterials”. These materials can exhibit unusual mesoscopic properties and include nanoparticles, coatings and thin films, metal–organic frameworks, membranes, nano-alloys, quantum dots, self-assemblies, 2D materials such as graphene, and nanotubes. Our journal, *Nanomaterials*, has the goal of publishing the highest quality papers on all aspects of nanomaterial science to an interdisciplinary scientific audience. All of our articles are published with rigorous refereeing and open access. We are proud of our increasing impact factor and ability to provide rapid decisions to authors.

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