Special Issue

Superhard Materials with Nanostructures

Message from the Guest Editors

The problem of creating materials that exceed the mechanical properties of diamond is widely discussed. The high values of strength and hardness of superhard materials formed by covalent bonds are due to the peculiarities of the mechanisms of plastic deformation at temperatures below the Debye temperature and are determined by their elastic modules. At the same time, in materials based on nanocluster structures, a decrease in the size of nanoclusters leads to an increase in elastic modules. This Special Issue of Nanomaterials is not restricted by the fundamental problem of the increase in elastic modules with a decrease in the size of covalent nanoclusters. The main target is properties and applications of superhard materials with nanostructures. Generalization and systematization of existing and obtaining new experimental and theoretical results will lead to an understanding of the nature of their high mechanical strength and will allow significant progress in the field of their search and synthesis.

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Message from the Editor-in-Chief

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.

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