



Journal of Nanomaterials

Special Issue on

Nanocrystalline Metals for Structural Applications

CALL FOR PAPERS

Nanocrystalline metals, with grain sizes falling in the nanometer range in at least one dimension, have emerged as a new class of materials and received worldwide attention. They are structurally characterized by a significant volume fraction of grain boundaries, which significantly alters their mechanical and physical properties in comparison with those of their conventional coarse-grained counterparts. For example, bulk nanocrystalline metals may possess strength several times higher than that of their coarse-grained counterparts, mainly owing to significant grain boundary strengthening. By tailoring the nanostructure, unique combinations of properties (e.g., high strength and good ductility) can be obtained in nanocrystalline metals that are not accessible by their coarse-grained counterparts. The drastically enhanced properties of nanocrystalline metals make them very promising candidates for many applications such as aerospace, automotive, and civil infrastructure.

There are many unaddressed issues in the field of nanocrystalline metals. For example, fabrication of bulk nanocrystalline metals (especially in large dimensions) still poses a challenge, the deformation mechanisms for nanocrystalline metals are not well understood, bulk nanocrystalline metals tend to have disappointing ductility, their thermal stability is a concern, and there is a lack of fundamental understanding of the relationship among processing, nanostructure, and mechanical behavior of nanocrystalline metals. These unaddressed issues have been attracting enormous amounts of research in the field.

The purpose of this special issue is to publish high-quality research papers as well as review articles providing fundamental insight, or finding solutions, to the important fundamental or technological problems associated with nanocrystalline metals.

Potential topics include, but are not limited to:

- Fabrication of nanocrystalline metals, including metal matrix composites
- Fundamental issues in severe plastic deformation processing
- Microstructure evolution during processing
- Deformation mechanisms
- Mechanical behavior
- Superplasticity
- Structural applications
- Stability of nanocrystalline metals
- Gradient and layered nanostructures
- Computational and analytical modeling

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First Round of Reviews

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