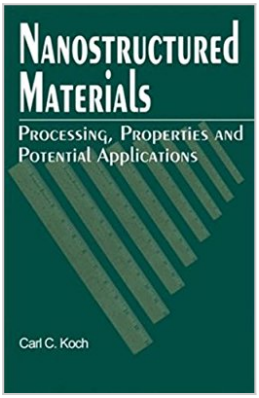

Nanostructured Materials: Processing Properties, and Potential Applications

By C. Koch

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Nanostructure science and technology has become an identifiable, if very broad and multidisciplinary, field of research and emerging application in recent years. It is one of the most visible and growing research areas in materials science in its broadest sense. Nanostructured materials include atomic clusters, layered (lamellar) films, filamentary structures, and bulk nanostructured materials. The common thread to these materials is the nanoscale dimensionality, i.e. at least one dimension less than 100 nm, more typically less than 50 nm. In some cases, the physics of such nanoscale materials can be very different form the macroscale properties of the same substance, offering often superior properties that warrant much interest in these materials.

Including contributions from twenty-one international contributors, Nanostructured Materials focuses on the synthesis, characterization, and properties relevant to nanostructured materials applications that require bulk and mainly inorganic materials. Topics include synthesis and processing of powders and films, thermal spray processing of nanocrystalline materials, solid state processing, nanocrystalline powder consolidation methods, electrodeposited nanocrystalline materials, computer simulation of nanomaterials, diffusion, gas reactive applications, magnetic properties, mechanical behavior, structure formation, mechanical behavior of two-phase materials, and more.

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Editorial Review

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Carl C. Koch is a Professor of Materials Science and Engineering at North Carolina State University. He received his Ph.D. in 1964 from Case Institute of Technology (now Case Western Reserve). Dr. Koch is the major researcher behind the discovery that metallic glasses could be produced through mechanical alloying. His research focuses on nanocrystalline materials, amorphization by mechanical attrition, mechanical alloying, rapid solidification, high temperature intermetallics, and oxide superconductors. He has published more than 230 papers and journal articles.

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