

A Complete Exploration of the Latest Research and Cutting-Edge Technologies

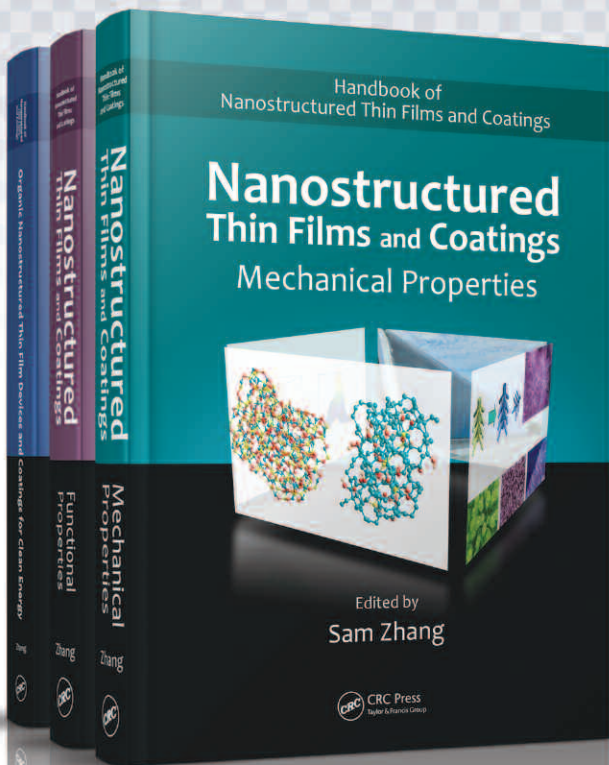
Handbook of Nanostructured Thin Films and Coatings

Three-Volume Set

Edited by a leading expert with contributions from pioneers, the three-volume **Handbook of Nanostructured Thin Films and Coatings** gives scientific researchers and product engineers a resource as dynamic and flexible as the field itself. This set employs a format that provides an introduction for newcomers and a comprehensive reference for experts. It explores developments in films and coatings and their indispensable role in research and development within nanotechnology as well as in engineering for product manufacturing.

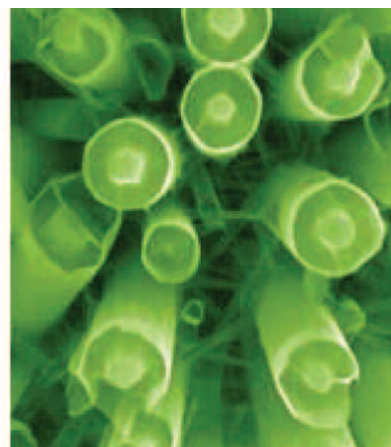
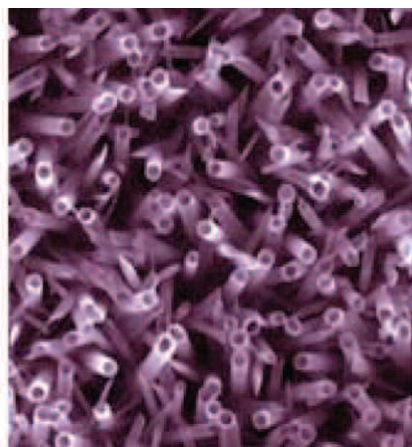
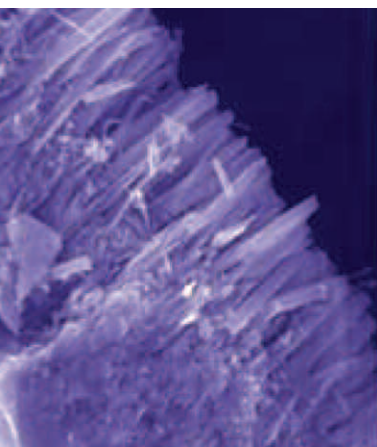
- Provides the latest research and applications of the mechanical and functional properties of thin films and coatings
- Explores cutting-edge organic nanostructured devices used to produce clean energy
- Presents figures, tables, and images that will aid research and help professionals acquire and maintain a solid grasp of this burgeoning field

Catalog no. 94351, June 2010, 1232 pp.
ISBN: 978-1-4200-9435-5, \$279.95 / £178.00

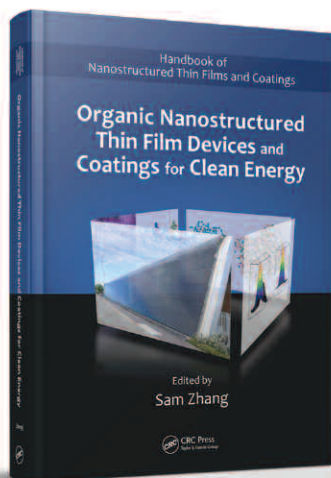


ABOUT THE EDITOR

Sam Zhang is a full professor at the School of Mechanical and Aerospace Engineering, Nanyang Technological University (Singapore) and has been involved in the fields of processing and characterization of thin films and coatings for the past 20 years. He is a fellow at the Institute of Materials, Minerals and Mining (U.K.), an honorary professor at the Institute of Solid State Physics, Chinese Academy of Sciences, and a guest professor at Zhejiang University and at Harbin Institute of Technology. This is his sixth book to date.



Handbook of Nanostructured Thin Films and Coatings



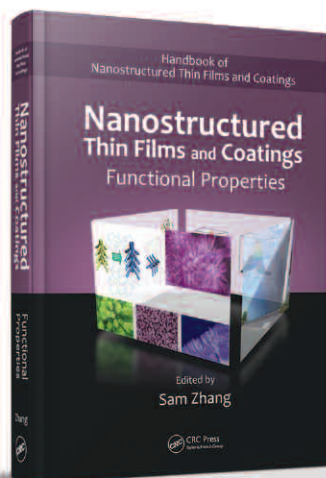
Volume 1:

Nanostructured Thin Films and Coatings Mechanical Properties

This first volume concentrates on the mechanical properties (hardness, toughness, adhesion, etc.), including processing, properties, and performance. It also offers a detailed analysis of theories and size effect, in addition to topics such as:

- Fundamentals of hard and superhard nanocomposites and heterostructures
- Determination of hardness and modulus of thin films
- Fracture toughness and interfacial adhesion strength of thin films: Indentation and scratch experiments and analysis
- Toughness and toughening of hard nanocomposite coatings
- Processing and mechanical properties of hybrid sol-gel-derived nanocomposite coatings
- Use of nanomechanics to optimize coatings for cutting tools
- Electrolytic deposition of nanocomposite coatings: Processing, properties, and applications

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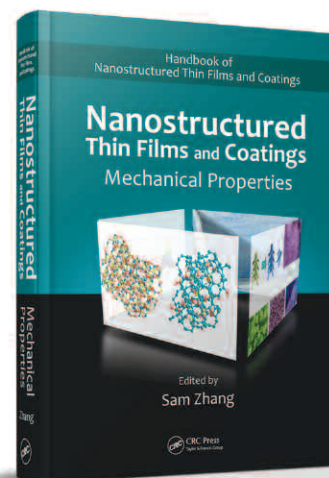
Volume 2:

Nanostructured Thin Films and Coatings Functional Properties

This second volume focuses on functional properties (i.e., optical, electronic, and electrical) and related devices and applications. It also addresses topics such as:

- Large-scale fabrication of functional thin films using nanoarchitecture via chemical routes
- Fabrication and characterization of SiC nanostructured/nanocomposite films
- Low-dimensional nanocomposite fabrication and its applications
- Optical and optoelectronic properties of silicon nanocrystals embedded in SiO₂ matrix
- Electrical properties of silicon nanocrystals embedded in amorphous SiO₂ matrix
- Optical aspects of properties and applications of sol-gel-derived nanostructured thin films
- Controllably micro/nanostructured films and devices
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Volume 3:

Organic Nanostructured Thin Film Devices and Coatings for Clean Energy

This third volume, **Organic Nanostructured Thin Film Devices and Coatings for Clean Energy**, addresses various aspects of the processing and properties of organic thin films, devices, and coatings for clean energy applications. Topics covered include:

- Thin-film solar cells based on the use of polycrystalline thin film materials
- Anodized titania nanotube array and its application in dye-sensitized solar cells
- Progress and challenges associated with photovoltaic applications of silicon nanocrystalline materials
- Semiconductive nanocomposite films for clean environment
- Thin-coating technologies and applications in high-temperature solid oxide fuel cells
- Nanoscale organic molecular thin films for information memory applications

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