



nanomaterials



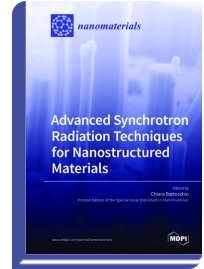
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Advanced Synchrotron Radiation Techniques for Nanostructured Materials

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Nanostructured materials exploit physical phenomena and mechanisms that cannot be derived by simply scaling down the associated bulk structures and phenomena; furthermore, new quantum effects come into play in nanosystems. The exploitation of these emerging nanoscale interactions prompts the innovative design of nanomaterials. Understanding the behavior of materials on all length scales—from the nanostructure up to the macroscopic response—is a critical challenge for materials science. Modern analytical technologies based on synchrotron radiation (SR) allow for the non-destructive investigation of the chemical, electronic, and magnetic structure of materials in any environment. SR facilities have developed revolutionary new ideas and experimental setups for characterizing nanomaterials, involving spectroscopy, diffraction, scatterings, microscopy, tomography, and all kinds of highly sophisticated combinations of such investigation techniques. This book is a collection of contributions addressing several aspects of synchrotron radiation as applied to the investigation of chemical, electronic, and magnetic structure of nanostructured materials. The results reported here provide not only an interesting and multidisciplinary overview of the chemico-physical investigations of nanostructured materials carried out by state-of-the-art SR-induced techniques, but also an exciting glance into the future perspectives of nanomaterial characterization methods.



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