

1. Record Nr.	UNINA9910763590903321
Titolo	Advanced Ceramics // edited by Shadia Jamil Ikhmayies
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	3-031-43918-X
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (308 pages)
Collana	Advances in Material Research and Technology, , 2662-477X
Disciplina	666
Soggetti	Perovskite (Mineral) Ceramic materials Nanotechnology Nanoelectromechanical systems Biophysics Nanoscience Perovskites Ceramics Nanoscale Design, Synthesis and Processing Nanoscale Devices Nanoscale Biophysics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Historical background of ceramics -- 2. Introductory remarks on ceramics -- 3. Classification of ceramics -- 4. Ceramics Processing -- 5. Novel processing ceramic techniques -- 6. Properties of Ceramics.
Sommario/riassunto	This book presents the fundamentals of advanced ceramics, their stages of development, types and classifications, advanced processing techniques, properties, sintering, and new forms of applications. It highlights specific examples such as alumina, zirconia, Mg-Al-spinels, silicon carbide, silicon nitride, ceramic composites, and thin films with their specific applications. The book reviews progress in perovskite ceramics, in which the synthesis, processing, characterization, and advanced applications of perovskite ceramics are all thoroughly discussed. In addition, developments of perovskite solar cells, the main factors affecting their stability, current problems, development

prospects in the research, and application of perovskite solar cells are all highlighted. This book also includes a review of a particular class of rare-earth-based mixed-metal oxides, namely  $\text{Ln}_2\text{B}_2\text{O}_7$  nanostructures ( $\text{B} = \text{Zr}, \text{Sn}, \text{and Ce}$ ), where advantages and disadvantages of each production technique are addressed along with the properties of as-produced nanostructures. The solar photocatalytic uses of  $\text{Ln}_2\text{B}_2\text{O}_7$  nanostructures such as photodegradation of contaminants are also discussed. Yttria-based transparent ceramics for photonic applications are reviewed, along with a discussion of powder synthesis, green body preparation, sintering, and optical properties. In addition, the fundamentals of electrophoretic deposition of hydroxyapatite incorporated composite coatings on metallic substrates are presented and discussed. The different types of ceramics-based self-healing coatings and their fabrication processes have also been reported and discussed in this book. These include titania, zirconia, titanium-alumina, and zirconia-alumina incorporated with Benzotriazole (BTA) as an inhibitor. Advanced ceramic materials that have been used for the purpose of wastewater treatment including ceramic sorbents, resins, aerosols, and ceramic membranes that have been widely used for wastewater treatment purposes are also discussed in depth. Moreover, the book presents the preparation of geopolymers by microwave treatments and explains how their properties can be tuned using microwaves. Furthermore, the future and perspective of these advanced ceramic materials and their modifications to ensure better efficacy toward environmental remediation purposes are highlighted in this book.

---