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CATALYTIC COMBUSTION OF SOOT -- Abstract -- 1. The Origination and Formation Mechanism of Soot -- 2. The Adverse and Emission Regulations of Soot -- 3. The Structure and Chemical Characterization of Soot -- 4. DPF and Oxidation Catalyst -- 5. Catalysts of the Catalytic Combustion of Soot -- 5.1. Low-Melting Point Catalyst -- 5.2. Noble Metal Catalysts.
5.3. Complex Oxide Catalysts -- 5.4. Macroporous-Based Catalysts -- 5.5. The Simultaneous Removal of Soot and NOx under Rich Oxygen Condition -- Conclusions and Prospects -- Acknowledgment -- References -- Chapter 3 CATALYTIC COMBUSTION OVER CHEAPER METAL OXIDES -- Abstract -- 1. General Introduction -- 1.1. Conventional Combustion -- 1.2. Impact of Nitrogen Oxides -- 1.3. Paths of NOx Formation -- 2. Important NOx Controlling Technologies -- 2.1. Catalytic Combustion -- 2.2. Characteristics of Catalytic Combustion -- 3. Catalytic Combustion Applications -- 3.1. Volatile Organic Compounds (VOCs) -- 3.1.1. VOC Abatement Technologies -- 3.1.2. Catalytic Oxidation versus Thermal Oxidation -- 3.2. Gas Turbines -- 4. Catalytic Materials for Combustion Applications -- 5. Catalytic Materials for VOC Oxidation -- 5.1. Metal Oxides -- 5.1.1. Chromium Oxide -- 5.1.2. Manganese Oxides -- 5.1.3. Copper Oxide and Cobalt Oxide -- 5.1.4. Cerium Oxide -- 5.2. Mixed Metal Oxides -- 5.2.1. Doped Metal Oxides -- 5.2.2. Perovskites -- 5.3. Supports for VOCs Oxidation -- 6. Catalytic Materials for Gas Turbine Applications -- 6.1. Active Component -- 6.2. Substrate -- 6.3. Wash Coat or Support -- 6.3.1. Alumina -- 6.3.2. Zirconia -- 6.3.3. Crystal Structure and Sintering Behavior of Hexa-aluminate -- 6.4. The Commonly Used Hexa-Aluminate Materials -- 6.4.1. Barium Hexa-aluminate (BHA) -- 6.4.2. Lanthanum Hexa-Aluminate (LHA) -- Conclusion -- Acknowledgments -- References -- Chapter 4 CATALYTIC COMBUSTION: KINETICS AND REACTOR DESIGN -- Abstract -- 1. Introduction -- 2. Catalytic Combustion Technologies -- 2.1. Power Generation Systems -- 2.2. Abatement of Volatile Organic Compounds (VOCs) -- 3. Kinetic Aspects of Catalytic Combustion -- 4. Reactor Design -- Conclusions -- References -- Chapter 5 CATALYTIC COMBUSTION OF METHANE OVER CERIA-ZIRCONIA CATALYSTS -- Abstract.
1. Introduction -- 2. The CeO2-ZrO2 System -- 2.1. Synthesis, Morphological Aspects and Structural Characterization -- 2.2. Oxygen Storage Capacity and Redox Properties -- 3. Methane Combustion over CeO2-ZrO2Catalysts -- Conclusions -- References -- Index.

Sommario/riassunto

Catalytic combustion has been developed as a method of promoting efficient combustion over a wide range of air-to-fuel ratios with a minimum pollutant formation at low temperatures as compared to conventional flame combustion. In this book, the authors present current research in the study of catalytic combustion including commercial and industrial research in combustion and fluidization engineering; the catalytic combustion of soot; using metal oxides to improve catalytic efficiency; catalytic combustion in the removal of pollutants from exhaust gases and in the energy conversion field and the catalytic combustion of methane using ceria-zirconia.

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Nota di contenuto	Using geospatial technologies and machine learning to map and mitigate urban heat islands and improve urban livability -- Urban expansion and thermal environment in a medium size city role of urban green and blue spaces in mitigating surface urban heat island intensity -- Identification of on road and roadside objects using random forest-based prediction model -- Analyzing the role of geospatial technologies and al in urban infrastructure planning and the development of smart cities, including transportation systems utilities, and public services -- Assessing the impact of night time light as proxy for climate change a geospatial approach in himachal pradesh -- Decadal study on supraglacial debris cover of kaer glacier eastern himalayas -- Sessing the impact of climate change on glaciers through region wise mass balance and ai tools contributing to our understanding of environmental changes in high mountain asia -- Climate change impacts on various ecosystems a geospatial and ai perspective -- Early identification and pathogenesis of leaf diseases in magnifera indica using transfer learning -- Examining the role of geospatial data and ai in conducting comprehensive forestry

inventories and mapping to support sustainable forest management -- Prioritization of erosion prone watersheds of the song river basin using morphometric indices coupled with ahp-topsis and geospatial technology -- Application of geospatial technologies and ai to detect and analyze the shoreline change of Visakhapatnam a coastal district -- A systematic and structured review on groundwater contamination sources prevalence health risk and mitigation strategies in relation with land use land cover in bihar state of india -- A systematic and structured review on groundwater contamination, sources, prevalence health risk and mitigation strategies in relation with land use land cover in bihar state of india -- Examining the role of geospatial technologies and ai in disaster risk management and response including hazard mapping vulnerability assessment and real-time monitoring -- Gis based landslide susceptibility assessment for coonoor taluk nilgiris district south india tamil nadu using machine learning algorithm -- Forecasting drought from satellite imagery comparing stochastic classical machine learning and deep learning approaches -- Smart geospatial intelligence and ai for a resilient environment a review -- Uncovering air pollution risks in indian scenario with explainable ai a case study perspective.

Sommario/riassunto

This edited volume brings together leading experts and researchers from diverse disciplines to provide insights into how geospatial data and AI technologies can be leveraged to tackle pressing environmental issues, ranging from climate change mitigation to natural resource management. By combining geospatial analysis with AI algorithms such as machine learning and deep learning, the book showcases innovative approaches for monitoring, modelling, and managing environmental systems at various scales. The chapters in this book bridge the gap between theory and practice, offering practical guidance and real-world case studies to readers interested in harnessing the potential of geospatial and AI technologies for sustainability and resilience initiatives. Through a series of chapters covering topics such as remote sensing, spatial data analysis, environmental modelling, and decision support systems, the book equips readers with the knowledge and tools necessary to address complex environmental challenges in an increasingly interconnected world. The book fills an important gap by providing a timely and authoritative resource that not only explores the theoretical foundations of geospatial and AI applications but also offers practical insights into their implementation and potential impact. Ultimately this volume seeks to empower readers with the knowledge and tools needed to address environmental challenges effectively and promote sustainable resilience in an ever-changing world. The contents here offer valuable insights and guidance for leveraging the transformative power of geospatial and AI technologies to create a more sustainable future. .