

Fire Resistant Geopolymers Role Of Fibres And Fillers To Enhance Thermal Properties Springerbriefs In Materials

This volume contains over 70 papers on advanced research and development of processing, mechanical properties and mechanics of ceramics and composites from the proceedings of the 30th International Conference on Advanced Ceramics and Composites, January 22-27, 2006, in Cocoa Beach, Florida. The conference was organized and sponsored by The American Ceramic Society and The American Ceramic Society’s Engineering Ceramics Division in conjunction with the Nuclear and Environmental Technology Division. It covers underlying fundamental links between microstructure and properties, and the ability to achieve desired multifunctional properties through innovative processing techniques.

Advances in Ceramic Matrix Composites, Second Edition, delivers an innovative approach to ceramic matrix composites, focusing on the latest advances and materials developments. As advanced ceramics and composite materials are increasingly utilized as components in batteries, fuel cells, sensors, high-temperature electronics, membranes and high-end biomedical devices, and in seals, valves, implants, and high-temperature engines, this book explores the substantial progress in new applications. Users will gain knowledge of the latest advances in CMCs, with an update on the role of ceramics in the fabrication of Solid Oxide Fuel Cells for energy generation, and on natural fiber-reinforced eco-friendly geopolymer and cement composites. The specialized information contained in this book will be highly valuable to researchers and graduate students in ceramic science, engineering and ceramic composites technology, and engineers and scientists in the aerospace, energy, building and construction, biomedical and automotive industries. Provides detailed coverage of parts and processing, properties and applications Includes new developments in the field, such as natural fiber-reinforced composites and the use of CMCs in Solid Oxide Fuel Cells (SOFCs) Presents state-of-the-art research, enabling the reader to understand the latest applications for CMCs

Collection of selected, peer reviewed papers from the 2014 Malaysia-Indonesia Geopolymer Symposium (MGS 2014), May 11-12, 2014, Kuala Lumpur, Malaysia. The 57 papers are grouped as follows: Chapter 1: Aggregate, Chapter 2: Geopolymer Technology, Chapter 3: Green Materials, Chapter 4: Coating

This book gathers papers from the International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD-2019), held on July 08-11, 2019 in Marrakech, Morocco, which address the environment, industry and economy, and the role of advanced intelligent systems and computing in connection with these three fields. The book includes a host of interesting studies and successful applications regarding the economy and industry, e.g. in Manufacturing, Digital Factories, Smart Supply Chain Management in Industry, Project Management in Industry, Digital Economy, Digital Business, M-commerce, Blockchain and Digital Currencies. In addition, the book highlights work that addresses the environmental aspect, covering topics such as Big Data Analysis & the Internet of Things for Environmental Management, Sensor Networks for Environmental Services, Network Interoperability in Environmental Ecosystems, Wireless Sensors and Cognitive Radio Networks, Environmental Management Computing Systems, Sustainable Mobility Solutions, Remote Sensing Applications, Geo-information & Geophysics. Addressing social, legislative and environmental aspects, the book is intended for all stakeholders in the industrial world. It will be of interest e.g. to customers, helping them improve their profits and economic profitability, and to professionals and fishermen working to evolve and optimize their supply chains, and to improve productivity, in the fiercely competitive I4.0 world. The authors of each chapter report on the state of the art and present the outcomes of their own research, laboratory experiments, and successful applications. The purpose of the book is to combine the idea of advanced intelligent systems with appropriate tools and techniques for modeling, management, and decision support in the fields of the environment, industry and economy.

Concrete Solutions

Advances in Ceramic Matrix Composites

1st International Conference on Advances in Mineral Resources Management and Environmental Geotechnology

Cotton and Flax Fibre-Reinforced Geopolymer Composites

ICSCFA 2021

Advanced Building Materials: Geopolymers

This book presents articles from the Second International Conference on Sustainable Civil Engineering and Architecture, held on 30 October 2021 in Ho Chi Minh City, Vietnam. The conference brings together international experts from both academia and industry to share their knowledge, expertise, to facilitate collaboration and improve cooperation in the field. The book highlights the latest advances in sustainable architecture and civil engineering, covering topics such as offshore structures, structural engineering, construction materials, and architecture.

Coal mining continues to make advances, especially in the areas of safety and environmental protection as a result of mining. This book contains nine peer-reviewed articles on green coal mining that address most of the important issues associated with improving coal mining. These issues include the protection of water above coal mines, both surface and ground water, and the subsidence that occurs during and after mining with methods to limit it and methods of rehabilitation. Additional issues include mine entry and production area support and methods to control gas emissions.

What can be done about the major concerns of our Global Economy on energy, global warming, sustainable development, user-friendly processes, and green chemistry? Here is an important contribution to the mastering of these phenomena today. Written by Joseph Davidovits, the inventor and founder of geopolymer science, it is an introduction to the subject for the newcomers, students, engineers and professionals. You will find science, chemistry, formulas and very practical information (including patents' excerpts) covering: – The mineral polymer concept: silicones and geopolymers, – Macromolecular structure of natural silicates and aluminosilicates, – Scientific Tools, X-rays, FTIR, NMR, – The synthesis of mineral geopolymers, Poly(silioxonate) and polysilicate, soluble silicate, Chemistry of (Na, K)oligo-sialates: hydrous aluminó-silicate gels and zeolites, Kaolinite / Hydrosodalite-based geopolymer, Metakaolin MK-750-based geopolymer, Calcium-based geopolymer, Rock-based geopolymer, Silica-based geopolymer, Fly ash-based geopolymer, Organic-mineral geopolymer, – Properties: physical, chemical and long-term durability, – Applications: Quality controls, Development of user-friendly systems, Castable geopolymer, industrial and decorative applications, Geopolymer / fiber composites, Foamed geopolymer, Geopolymers in ceramic processing, Manufacture of geopolymer cement, Geopolymer concrete, Geopolymers in toxic and radioactive waste management. It is a textbook, a reference book instead of being a collection of scientific papers. Each chapter is followed by a bibliography of the relevant published literature including 75 patents, 120 tables, 360 figures, 550references, 700 authors cited, representing the most up to date contributions of the scientific community. The industrial applications of geopolymers with engineering procedures and design of processes are also covered in this book.

New two-dimensional materials based on clays and clay minerals are attracting attention for their outstanding properties that make them useful as hosts or supporting matrices in applications such as pharmaceuticals, tissue engineering, environmental remediation, biosensors, filtration, wound dressings, drug delivery, and more. This book is a comprehensive overview of clay science and technology, focusing on synthesis, characterization, simulation, and applications. Chapters cover such topics as polymer-clay nanocomposites, the structure and properties of different clays, the use of clays for environmental remediation, and much more.

Geopolymers as Sustainable Surface Concrete Repair Materials

Proceedings of the 41st International Conference on Advanced Ceramics and Composites, Volume 38, Issue 3

Proceedings of ASMA-2021

Geopolymers

Proceedings of the World Congress Geopolymer 2005

Structures, Processing, Properties and Industrial Applications

Chemical and physical treatment of industrial waste materials into environmentally friendly materials. The vast list of applications includes thermal insulation, fire-resistant materials, construction materials, refractory linings, cements and concretes, encapsulation of radioactive and toxic waste etc. The book presents the technological processes involved, as well as the characterization and applications of the resulting ecomaterials. Keywords: Geopolymerization, Industrial Waste Materials, Green Materials, Thermal Insulation, Fire-resistant Materials, Construction Materials, Refractory Linings, Cements and Concretes, Encapsulation of Radioactive Waste, Encapsulation of Toxic Waste, Thermal Power Plant Ash, Aluminosilicates Recycling, Porous Geopolymers, Environmentally Friendly Concrete.

The Handbook of Sustainable Concrete and Industrial Waste Management summarizes key research trends in recycling and reusing concrete and industrial waste to reduce their environmental impact. This volume also includes important contributions in collaboration with the CRI-TEST Innovation Lab, Naples – Acerra. Part one discusses eco-friendly innovative cement and concrete and reviews key substitute materials. Part two analyzes the use of industrial waste as aggregates and the mechanical properties of concrete containing waste materials. Part three discusses differences between innovative binders, focusing on alkali-activated and geopolymer concrete. Part four provides a thorough overview of the life cycle assessment (LCA) of concrete containing industrial wastes and the impacts related to the logistics of wastes, the production of the concrete, and the management of industrial wastes. By providing research examples, case studies, and practical strategies, this book is a state-of-the-art reference for researchers working in construction materials, civil or structural engineering, and engineers working in the industry. Offers a systematic and comprehensive source of information on the latest developments in sustainable concrete; Analyzes different types of sustainable concrete and innovative binders from chemical, physical, and mechanical points of view; Includes real case studies showing application of the LCA methodology.

Geopolymer is an amorphous aluminosilicate binder which is produced by hydrothermal synthesis of aluminosilicates in the presence of concentrated alkaline or alkaline silicate solutions. It is an emerging construction material purported to provide an environmentally-friendly alternative to ordinary Portland cement (OPC) based concrete. Owing to its ceramic-like properties, geopolymer has been touted to be a highly fire resistant material. This claim is further supported by results from investigations of residual strength after thermal exposure. Some studies have found that geopolymers increase in strength after exposure to temperatures of 800°C. In contrast, several recent studies have shown a decrease in residual strength of geopolymers after a similar exposure. These contradictory observations are explored here. The study shows that two opposing processes are occurring simultaneously in geopolymers at elevated temperatures. Process (1) is further geopolymerization, and has the effect of increasing the strength. Process (2) is the damage due to thermal incompatibility which arises because of (i) the temperature gradient and (ii) different movements between matrix and inclusions. Process (2) is also a function of the brittleness level of the material. Whether the strength increases or decreases is dependent on which of the two processes is dominant in the specimen and the test conditions.The detailed examination of process (2) reveals a strong correlation between the degree of strength loss and the brittleness of geopolymers. This correlation suggests that geopolymers are quite brittle. For the first time, the brittleness of geopolymer concrete has been quantitatively determined and compared with OPC concrete. The comparatively high brittleness of geopolymer concrete is important for its fire resistance properties. The high brittleness will also require special structural design measures, similar to the design requirements for high strength concrete. With regard to the fire resistance of geopolymers, most research to date has investigated only residual strength, but the properties of geopolymer while hot have received less attention. Therefore, a number of tests to determine stress-strain curve, ultimate strength, elastic modulus and creep were undertaken in steady and transient heating conditions. In these tests, several critical features of the material’s performance were observed: (1) geopolymers exhibit glass transition behaviour at elevated temperatures; (2) glass transition temperature is improved by the substitution of a sodium-based activator for the potassium-based activator; (3) below glass transition temperature there is a significant increase in hot strength and hot elastic modulus; (4) in the range of 250-550°C thermal transitional creep is absent as compared to OPC concrete. Data obtained from these measurements can serve as input for the development of constitutive models which are essential to predict the response of geopolymer concrete elements in fire. In addition to its deteriorating properties at high temperatures, concrete can also be damaged in fire by a phenomenon called spalling which occurs in high strength concrete. Since geopolymer is comparatively more brittle than high strength concrete, the issue of spalling in fire is further explored in the last part of this study. It was found that the spalling resistance of geopolymer concrete increases as maximum aggregate size increases. The increasing aggregate size results in an increase in fracture zone length (lp); this in turn reduces the flux of kinetic energy (due to pore pressure) that is released into the fracture front and thereby improves spalling resistance. This theory is further validated by the observation of a good correlation between lp and spalling resistance in this thesis. This study is the first to propose such a hypothesis on the effect of aggregate size on the spalling of concrete. Both OPC and geopolymer, and contributes to a better understanding of spalling of concrete in fire.

This proceedings contains a collection of 24 papers from The American Ceramic Society’s 41st International Conference on Advanced Ceramics and Composites, held in Daytona Beach, Florida, January 22-27, 2017. This issue includes papers presented in the following symposia: • Symposium 3 14th International Symposium on Solid Oxide Fuel Cells (SOFC) • Symposium 8 11th International Symposium on Advanced Processing & Manufacturing Technologies for Structural & Multifunctional Materials and Systems • Symposium 11 Advanced Materials and Innovative Processing ideas for the Production Root Technology • Symposium 12 Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nano-laminated Ternary Carbides and Nitrides (MAX Phases) • Symposium 13 Advanced Materials for Sustainable Nuclear Fission and Fusion Energy • Symposium 14 Crystalline Materials for Electrical, Optical and Medical Applications • Symposium 15 Additive Manufacturing and 3D Printing Technologies • Focused Session 1 Geopolymers, Chemically Bonded Ceramics, Eco-friendly and Sustainable Materials

Characteristics, Properties, Performance, and Applications

Fire-Resistant Geopolymers

Role of Fibres and Fillers to Enhance Thermal Properties

Proceedings of the 106th Annual Meeting of The American Ceramic Society, Indianapolis, Indiana, USA 2004

Geopolymer, Green Chemistry and Sustainable Development Solutions

Concrete Solutions 2011

The Concrete Solutions series of International Conferences on Concrete Repair began in 2003, with a conference held in St. Malo, France in association with INSA Rennes, followed by the second conference in 2006 (with INSA again, at St. Malo, France), and the third conference in 2009 (in Padova and Venice, in association with the University of Padova). Now in 2011, the event is being held in Dresden in Germany and has brought together some 112 papers from 33 countries. Whereas electrochemical repair tended to dominate the papers in earlier years, new developments in structural strengthening with composites have been an increasingly important topic, with a quarter of the papers now focusing on this area. New techniques involving Near Surface Mounted (NSM) carbon fibre rods, strain hardening composites, and new techniques involving the well established carbon fibre and polyimide wrapping and strengthening systems are presented. Seventeen papers concentrate on case studies which are all-important in such conferences, to learn about what works (and what doesn’t work) on real structures. Thirteen papers are devoted to new developments in Non-Destructive Testing (NDT). Other topics include service life modelling, fire damage, surface protection methods and coatings, patch repair, general repair techniques and whole life costing. This book is essential reading for anyone engaged in the concrete repair field, from engineers, to academics and students and also to clients, who, as the end user, are ultimately responsible for funding these projects and making those difficult decisions about which system or method to use.

This issue contains 27 papers from The American Ceramic Society’s 40th International Conference on Advanced Ceramics and Composites, held in Daytona Beach, Florida, January 24-29, 2016. This issue includes papers presented in the following Symposia and Focused Sessions: Symposium 2 – Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications; Symposium 10 – Virtual Materials (Computational) Design and Ceramic Genome; Symposium 11 – Advanced Materials and Innovative Processing Ideas for the Industrial Root Technology; Symposium 12 – Materials for Extreme Environments: Ultrahigh Temperature Ceramics; and Emerging Technologies Symposium–Carbon Nanostructures; and Focused Session 1 - Geopolymers and Chemically Bonded Ceramics.

A geopolymer is a solid aluminosilicate material usually formed by alkali hydroxide or alkali silicate activation of a solid precursor such as coal fly ash, calcined clay and/or metallurgical slag. Today the primary application of geopolymer technology is in the development of reduced-CO2 construction materials as an alternative to Portland-based cements. Geopolymers: structure, processing, properties and industrial applications reviews the latest research on and applications of these highly important materials. Part one discusses the synthesis and characterisation of geopolymers with chapters on topics such as fly ash chemistry and inorganic polymer cements, geopolymer precursor design, nanostructure/microstructure of metakaolin and fly ash geopolymers, and geopolymer synthesis kinetics. Part two reviews the manufacture and properties of geopolymers including accelerated ageing of geopolymers, chemical durability, engineering properties of geopolymer concrete, producing fire and heat-resistant geopolymers, utilisation of mining wastes, thermal properties of geopolymers. Part three covers applications of geopolymers with coverage of topics such as commercialisation of geopolymers for construction, as well as applications in waste management. With its distinguished editors and international team of contributors, Geopolymers: structure, processing, properties and industrial applications is a standard reference for scientists and engineers in industry and the academic sector, including practitioners in the cement and concrete industry as well as those involved in waste reduction and disposal. Discusses the synthesis and characterisation of geopolymers with chapters covering fly ash chemistry and inorganic polymer cements Assesses the application and commercialisation of geopolymers with particular focus on applications in waste management Reviews the latest research on and applications of these highly important materials

Increasingly stringent environmental regulations and industry adoption of waste minimization guidelines have thus, stimulated the need for the development of recycling and reuse options for metal related waste. This book, therefore, gives an overview of the waste generation, recycle and reuse along the mining, beneficiation, extraction, manufacturing and post-consumer value chain. This book reviews current status and future trends in the recycling and reuse of mineral and metal waste and also details the policy and legislation regarding the waste management, health and environmental impacts in the mining, beneficiation, metal extraction and manufacturing processes. This book is a useful reference for engineers and researchers in industry, policymakers and legislators in governance, and academics on the current status and future trends in the recycling and reuse of mineral and metal waste. Some of the key features of the book are as follows: Holistic approach to waste generation, recycling and reuse along the minerals and metals extraction. Detailed overview of metallurgical waste generation. Practical examples with complete flow sheets, techniques and interventions on waste management. Integrates the technical issues related to efficient resources utilization with the policy and regulatory framework. Novel approach to addressing future commodity shortages.

Developments in Porous, Biological and Geopolymer Ceramics, Volume 28, Issue 9

Ceramic Engineering and Science Proceedings, Volume 34

Non-Conventional Materials and Technologies

Design, Properties and Durability

Geopolymer Chemistry and Applications

Advances in Structural Mechanics and Applications

The book covers the topic of geopolymers, in particular it highlights the relationship between structural differences as a result of variations during the geopolymer synthesis and its physical and chemical properties. In particular, the book describes the optimization of the thermal properties of geopolymers by adding micro-structural modifiers such as fibres and/or fillers into the geopolymer matrix. The range of fibres and fillers used in geopolymers, their impact on the microstructure and thermal properties is described in great detail. The book content will appeal to researchers, scientists, or engineers who are interested in geopolymer science and technology and its industrial applications.

This book highlights the current research, conceptual and practical utilization of waste in building materials. It examines the production of industrial and agricultural wastes that have been generated worldwide and have significant environmental impact. The book discusses how to incorporate these wastes effectively with greener technology and how to address its environmental impact in order to produce environmentally friendly and sustainable green products. This book also will capitalize on its practical application, properties, performance and economic advantages. The topics covered include the physical, mechanical and environmental properties, leaching behaviour, gas emissions and performance of sustainable construction materials. This book offers a valuable reference for researchers, industries and interested stakeholders in sustainable construction or any allied fields.

This book provides an updated state-of-the-art review on new developments in alkali-activation. The main binder of concrete, Portland cement, represents almost 80% of the total CO2 emissions of concrete which are about 6 to 7% of the Planet’s total CO2 emissions. This is particularly serious in the current context of climate change and it could get even worse because the demand for Portland cement is expected to increase by almost 200% by 2050 from 2010 levels, reaching 6000 million tons/year. Alkali-activated binders represent an alternative to Portland cement having higher durability and a lower CO2 footprint. Reviews the chemistry, mix design, manufacture and properties of alkali-activated cement-based concrete binders Considers performance in adverse environmental conditions. Offers equal emphasis on the science behind the technology and its use in civil engineering.

Concrete Solutions contains the contributions from some 30 countries to Concrete Solutions, the 6th International Conference on Concrete Repair (Thessaloniki, Greece, 20-23 June 2016). Strengthening and retrofitting are major themes in this volume, with NDT and electrochemical repair following closely, discussing the latest advances and technologies in concrete repair. The book brings together some interesting and challenging theoretical approaches and questions if we really understand and approach such topics as corrosion monitoring correctly. Concrete Solutions is an essential reference work for those working in the concrete repair field, from engineers to architects and from students to clients. The Concrete Solutions Series of international conferences on concrete repair began in 2003 with a conference held in St. Malo, France in association with INSA Rennes. Subsequent conferences have seen the Series partnering with the University of Padua (Italy) in 2009, with TU Dresden (Germany) in 2011 and with Queen’s University Belfast (Northern Ireland) in 2014. In 2016 Thessaloniki (Greece) hosted the conference, partnering with both Aristotle University of Thessaloniki (AUTH) and Democritus University of Thrace (DUTH). The next conference in the series will be held in 2019 in Istanbul.

Proceedings of the Second International Conference on Sustainable Civil Engineering and Architecture

Green Materials Obtained by Geopolymerization For a Sustainable Future

Developments in Strategic Materials and Computational Design IV

Handbook of Alkali-Activated Cements, Mortars and Concretes

Synthesis, Properties and Applications

Handbook of advances in Alkali-activated Concrete

Masonry walls constitute the interface between the buildings interior and the outdoor environment. Masonry walls are traditionally composed of fired-clay bricks (solid or perforated) or blocks (concrete or earth-based), but in the past (and even in the present) they were often associated as needing an extra special thermal and acoustical insulation layer. However, over more recent years investigations on thermal and acoustical features has led to the development of new improved bricks and blocks that no longer rely on concrete or earth-based blocks) that don’t offer improved performance in terms of thermal and acoustical insulation are a symbol of a low-technology past, that are far removed from the demands of sustainable construction. This book provides an up-to-date state-of-the-art review on the eco-efficiency of masonry units, particular emphasis is placed on the design, properties, performance, durability and LCA of these materials. Since masonry units are also an excellent way to reuse bulk industrial waste the book will cover 2008/98/EC which states that the minimum reuse and recycling targets for construction and demolition waste (CDW) should be at least 70% by 2020. On the 9th of March 2011 the European Union approved the Regulation (EU) 305/2011, known as the Construction Products Regulation (CPR) and it will be enforced after the 1st of July 2013. The future commercialization of construction materials in Europe makes their environmental assessment mandatory meaning that more information related to the environmental authoritative guide to the eco-efficiency of masonry units Examines the reuse of waste materials Covers a range of materials including, clay, cement, earth and pumice

Advances on Alkali-activated Concrete, provides comprehensive information on materials, structural properties and realistic potential for the application of alkali-activated concretes and cements. Divided over seven key parts, including the design of alkali-activated concrete, their fabrication and curing, rheology, properties of alkali-activated concrete, durability, dynamic performance and LCA, the book will be an essential reference resource for academic and industrial researchers, materials scientists, chemists, manufac and concrete structures. Provides an essential guide on the latest developments in alkali-activated concrete Comprehensively examines alkali-activated concrete performance under cyclic loading including concrete systems containing coarser aggregates Presents several important cases studies of application

Ceramic Engineering and Science Proceedings, Volume 34, Issue 9: Developments in Strategic Materials and Computational Design IV A collection of 25 papers from The American Ceramic Society’s 37th International Conference on Advanced Ceramics and Composites, held in Daytona Beach, Florida, January 27-February 1, 2013. This issue includes papers presented in the Geopolymers and Chemically Bonded Ceramics (Focused Session 1); Thermal Management Materials and Technologies (Focused Session 2); and Materials for Extreme Environments: Ultrahigh Temperature Ceramics and Composites (MAX Phases) (Symposium 12)

This book provides an overview on the latest advances in the synthesis, properties and applications of geopolymers reinforced with natural fibres such as pulp fibre, cotton, sisal, flax and hemp. The influence of adding various natural fibres and nanofillers on the mechanical properties of these composites is discussed. Potential challenges and future directions of these composites are highlighted and addressed. The content of this book caters to students, researchers and academics who are interested in the synthesis of fibre-reinforced composites.

Advances in Structural Technologies

Handbook of Sustainable Concrete and Industrial Waste Management

Geopolymers: The route to eliminate waste and emissions in ceramic and cement manufacturing

Volume 3 - Advanced Intelligent Systems for Sustainable Development Applied to Environment, Industry and Economy

Advances in Materials Science for Environmental and Energy Technologies VI

The growing presence of biomass and waste has caused significant changes to the environment. With the ubiquity of these materials, there is an increasing need for proper disposal and reuse of these resources. Applied Environmental Materials Science for Sustainability is a key resource on the latest advancements in environmental materials, including the utilization of biomass and waste for advanced materials. Highlighting innovative studies on renewable resources, green technology, and chemical modification, this book is an ideal reference source for academics, researchers, professionals, and graduate students in the field of environmental and materials sciences and technologies.

The progressive deterioration of concrete surface structures is a major concern in construction engineering that requires precise repairing. While a number of repair materials have been developed, geopolymer mortars have been identified as potentially superior and environmentally friendly high-performance construction materials, as they are synthesized by selectively combining waste materials containing alumina and silica compounds which are further activated by a strong alkaline solution. Geopolymers as Sustainable Surface Concrete Repair Materials offers readers insights into the synthesis, properties, benefits and applications of geopolymer-based materials for concrete repair. • Discusses manufacturing and design methods of geopolymer-based materials Assesses mechanical strength and durability of geopolymer-based materials under different aggressive environmental conditions • Characterizes the microstructure of these materials using XRD, SEM, EDX, TGA, DTG and FTIR measurements • Describes application of geopolymer-based materials as surface repair materials • Compares environmental and cost benefits against those of traditional OPC and cement mortars
This book contains the keynotes, invited presentations, and professional engineers working with concrete materials, including civil and materials engineers.

High-Performance Materials from Bio-based Feedstocks The latest advancements in the production, properties, and performance of bio-based feedstock materials In High-Performance Materials from Bio-based Feedstocks, an accomplished team of researchers delivers a comprehensive exploration of recent developments in the research, manufacture, and application of advanced materials from bio-based feedstocks. With coverage of bio-based polymers, the inorganic components of biomass, and the conversion of biomass to advanced materials, the book illustrates the research and commercial potential of new technologies in the area. Real-life applications in areas as diverse as medicine, construction, synthesis, energy storage, agriculture, packaging, and food are discussed in the context of the structural properties of the materials used. The authors offer deep insights into materials production, properties, and performance. Perfect for chemists, environmental scientists, engineers, and materials scientists, High-Performance Materials from Bio-based Feedstocks will also earn a place in the libraries of academics, industrial researchers, and graduate students with an interest in biomass conversion, green chemistry, and sustainability. A thorough introduction to the latest developments in advanced bio-based feedstock materials research Comprehensive explorations of a vast range of real-world applications. From tissue scaffolds and drug delivery to batteries, sorbents, and controlled release fertilizers Practical discussions of the organic and inorganic components of biomass and the conversion of biomass to advanced materials In-depth examinations of the structural properties of commercially and academically significant biomass materials For more information on the Wiley Series in Renewable Resources, visit www.wiley.com/go/rms

This book contains the keynote presentations, invited speeches, and general session papers presented at the 2nd International Symposium on Asia Urban GeoEngineering, which will be held from 24 November to 27 November 2017 in Changsha, China. The contents will cover the topics of (i) Environmental behavior and constitutive model of geomaterials, (ii) Excavation and slope engineering, (iii) Tunnel and underground engineering, (iv) Foundation and foundation treatment, (v) Environmental geotechnical engineering, (vi) Numerical methods in geotechnical engineering. It will provide an opportunity to share knowledge and experiences of the analysis, design, construction, and maintenance of urban geoeengineering among engineers, researchers, and professors in Asian countries. It will improve our knowledge of requirements of geoeengineering for a long-term sustainable urban development and the need to protect and preserve our environment.

Advances in Ceramic Matrix Composites X

Select Proceedings of CoAST 2019

Proceedings of Concrete Solutions, 6th International Conference on Concrete Repair, Thessaloniki, Greece, 20-23 June 2016

Handbook of Research on Supply Chain Management for Sustainable Development

Geopolymer and Green Technology Materials

Advanced Composites in Aerospace Engineering Applications

The proceedings of the conference is going to benefit the researchers, academicians, students and professionals in getting enlightened on latest technologies on structural mechanics, structure and infrastructure engineering. Further, work on practical applications of developed scientific methodologies to civil structural engineering will make the proceedings more interesting and useful to practicing engineers and structural designers.

The purpose of this writing this book is to express the properties of Rise Husk Ash (RHA) based geopolymer incorporate with, (GGBS) at ambient curing conditions, which can be treated as a substitute to the (OPC). The work constructs with subsidizes for fabrication of innovative eco-friendly binders in concrete. Even though, present several research that evaluate the performance of geopolymer. using numerous kinds of source material, much of this research has concentrated on rice husk ash as primary source material. Only inadequate studies till conducted in large-volume mortars of RHA-based geopolymer, using sensible compressive strength and no further studies with GGBS have been combined.

Ceramic matrix composites are likely candidates for high-temperature structural applications in industries such as aerospace, utilities, and transportation. This volume includes papers on advances in basic science and technology of ceramic matrix composites and how these advances can be used to address technological issues faced by industry.

This book presents an authoritative account of the potential of advanced composites such as composites, biocomposites, composites geopolymer, hybrid composites and hybrid biocomposites in aerospace application. It documents how in recent years, composite materials have grown in strength, stature, and significance to become a key material of enhanced scientific interest and resultant research into understanding their behavior for selection and safe use in a wide spectrum of technology-related applications. This collection highlights how their unique combination of superior properties such as low density, high strength, high elastic modulus, high hardness, high temperature capability, and excellent chemical and environmental stability are optimized in technologies within these field.

NOCMAT for the XXI Century

Mechanical Properties and Performance of Engineering Ceramics II

Clay and Clay Minerals

Sustainable Waste Utilization in Bricks, Concrete, and Cementitious Materials

High-Performance Materials from Bio-based Feedstocks

Advanced Intelligent Systems for Sustainable Development (AI2SD'2019)

An excellent one-volume resource for understanding the most important current issues in the research and advances in materials science for environmental and energy technologies This proceedings volume contains a collection of 20 papers from the 2016 Materials Science and Technology (MS&T'16) meeting held in Salt Lake City, UT, from October 24-27 of that year. These conference symposia provided a forum for scientists, engineers, and technologists to discuss and exchange state-of-the-art ideas, information, and technology on advanced methods and approaches for processing, synthesis, characterization, and applications of ceramics, glasses, and composites. Topics covered include: the 8th International Symposium on Green and Sustainable Technologies for Materials Manufacturing Processing; Materials Issues in Nuclear Waste Management in the 21st Century; Construction and Building Materials for a Better Environment; Materials for Nuclear Applications and Extreme Environments; Nanotechnology for Energy, Healthcare, and Industry; and Materials for Processes for CO2 Capture, Conversion and Sequestration. Logically organized and carefully selected articles give insight into advances in materials science for environmental and energy technologies. Incorporates the latest developments related to advances in materials science for environmental and energy technologies Advances in Materials Science for Environmental and Energy Technologies VI: Ceramic Transactions Volume 262 is ideal for academics in mechanical and chemical engineering, materials and or ceramics, chemistry departments and for those working in government laboratories.

Papers from The American Ceramic Society's 31st International Conference on Advanced Ceramics and Composites, held in Daytona Beach, Florida, January 21-26, 2007. Includes papers on porous ceramics ranging from nanoporous to macroporous systems, including foams, honeycombs, 3D scaffolds, interconnected fibers, sintered hollow spheres, and aerogels; ceramics in medical applications; and geopolymers, a new class of totally inorganic, aluminosilicate-based ceramics that are charge balanced by group I oxides (i.e., Na, K, and Cs)

This book comprises select proceedings of the National Conference on Advances in Structural Technology (CoAST 2019). It brings together different applied and technological aspects of structural engineering. The main topics covered in this book include solid mechanics, composite structures, fluid-structure interaction, soil-structure interaction, structural safety, and structural health monitoring. The book also focuses on emerging structural materials and the different behavior of civil, mechanical, and aerospace structural systems. Given its contents, this book will be a useful reference for researchers and practitioners working in structural safety and engineering.

The issue of sustainability has become a vital discussion in many industries within the public and private sectors. In the business realm, incorporating such practices allows organizations to redesign their operations more effectively. The Handbook of Research on Supply Chain Management for Sustainable Development is a critical scholarly resource that examines academic and corporate interest in sustainability in all facets of business management. Featuring coverage on a wide range of topics such as green supply chains, environmental standards, and production planning, this book is geared toward professionals, researchers, and managers seeking current and relevant research on optimizing supply chains to ensure fair labor practices, lower emissions, and a cleaner environment.

Applied Environmental Materials Science for Sustainability

Recycled and Artificial Aggregate, Innovative Eco-friendly Binders, and Life Cycle Assessment

Eco-efficient Masonry Bricks and Blocks

Green Coal Mining Techniques 2020

A Collection of Papers Presented at the 40th International Conference on Advanced Ceramics and Composites, January 24-29, 2016, Daytona Beach, Florida

Developments in Strategic Ceramic Materials II

The book presents new research in the area of biobased “green composites”. Biobased materials involve renewable agricultural and forestry feedstocks, including wood, agricultural waste, grasses and natural plant fibers. These lignocellulosic materials are composed mainly of carbohydrates such as sugar and lignin, cellulose, vegetable oils and proteins. Much research is concerned with renewable materials such as bamboo, vegetable fibers, soil composites and recycled materials such as rice husk ash and sugar cane ash. The general aim here is to use renewable and non-polluting materials in ways that offer a high degree of sustainability and preserve the remaining natural resources for future generations. Keywords: Biobased Materials, Renewable Materials, Non-polluting Materials, Sustainability, Wood, Agricultural Waste, Grasses, Natural Plant Fibers, Lignocellulosic Materials, Carbohydrates, Sugars, Lignin, Cellulose, Vegetable Oils, Proteins, Bamboo, Vegetable Fibers, Soil Composites, Recycled Materials, Rice Husk Ash, Sugar Cane Ash, Fiber-reinforced Concrete, Post-disaster Reconstruction, Guadua Fibers, Prefabricated Bamboo Guadua Panels, Multi-Level Bamboo Structures, Alkaline Activated Cements, Polymer Residues Reinforced with Glass Fiber, Composites Reinforced with Vegetal Fibers, Sisal Fibers, Bamboo Arch Structure, Adobe Reinforced with Wheat Fibers, Fiber Reinforced Microconcrete, Cements with High Coal Waste Contents, Natural Composites, Geopolymer Concretes.

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Mechanical Properties of Geopolymeric Materials at Elevated Temperatures