Patent Search

Invention Title	NANOFIBER-REINFORCED GLASS CERAMIC MATRIX COMPOSITES FOR ADVANCED APPLICATIONS
Publication Number	40/2023
Publication Date	06/10/2023
Publication Type	INA
Application Number	202341060896
Application Filing Date	11/09/2023
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	METALLURGY
Classification (IPC)	C03C0014000000, C03C0010000000, A61P0035000000, A61P0029000000, C04B0035800000

Inventor

Name	Address	Country	Nationality
Dr. Y. Anantha Lakshmi	Assistant Professor, H & S Department, Marri Laxman Reddy Institute of Technology, Dundigal, Hyderabad, Telangana, India, Pincode: 500043	India	India
Dr. Ganesh B. Akat	Assistant Professor in Chemistry, Department of Chemistry, Kohinoor Arts, Commerce & Science College, Khultabad, Aurangabad, Maharashtra, India, Pincode: 431101	India	India
Dr. Nellore Manoj Kumar	Independent Researcher, Founder & CEO, Infinite-Research Organization, B.O, 15-225, Gollapalem, Venkatagiri, Tirupati, Andhra Pradesh, India, Pincode: 524132	India	India
Dr. Seema Habib Isa	Assistant Professor, Department of Chemistry, G. M. Momin Women's College, Bhiwandi, Thane, Maharashtra, India, Pincode: 421302	India	India
Dr. M. A. Baseer	Professor, Department of Chemistry, Yeshwant College, Nanded, Maharashtra, India, Pincode: 431602	India	India
Dr. C. Sankar	Associate Professor and Head, Department of Chemistry, Velammal College of Engineering and Technology, Madurai, Tamil Nadu, India, Pincode: 625009	India	India
Dr. Selva Ganapathy M	Research Co-Ordinator, Centre for Scientific Research & Advanced Learning, Mount Carmel College (Autonomous), Bengaluru, Karnataka, India, Pincode: 560052	India	India
Dr. Renuka C	Assistant Professor, Department of Physics, K.S. Institute of Technology, 41, Raghuvanahalli, Kanakapura Main Road, Bengaluru, Karnataka, India, Pincode: 560109	India	India
Dr. M.S.N.A. Prasad	Assistant Professor, Department of Chemistry, Institute of Aeronautical Engineering (IARE), Dundigal, Hyderabad, Telangana, India, Pincode: 500043	India	India
Dr. D.A. Shahakar	Assistant Professor, Electrical Engineering Department, P.R. Pote (Patil) College of Engineering & Management, Amravati, Maharashtra, India, Pincode: 444602	India	India

Applicant

Name	Address	Country	Nationality
Dr. Y. Anantha Lakshmi	Assistant Professor, H & S Department, Marri Laxman Reddy Institute of Technology, Dundigal, Hyderabad, Telangana, India, Pincode: 500043	India	India
Dr. Ganesh B. Akat	Assistant Professor in Chemistry, Department of Chemistry, Kohinoor Arts, Commerce & Science College, Khultabad, Aurangabad, Maharashtra, India, Pincode: 431101	India	India
Dr. Nellore Manoj Kumar	Independent Researcher, Founder & CEO, Infinite-Research Organization, B.O, 15-225, Gollapalem, Venkatagiri, Tirupati, Andhra Pradesh, India, Pincode: 524132	India	India
Dr. Seema Habib Isa	Assistant Professor, Department of Chemistry, G. M. Momin Women's College, Bhiwandi, Thane, Maharashtra, India, Pincode: 421302	India	India
Dr. M. A. Baseer	Professor, Department of Chemistry, Yeshwant College, Nanded, Maharashtra, India, Pincode: 431602	India	India
Dr. C. Sankar	Associate Professor and Head, Department of Chemistry, Velammal College of Engineering and Technology, Madurai, Tamil Nadu, India, Pincode: 625009	India	India
Dr. Selva Ganapathy M	Research Co-Ordinator, Centre for Scientific Research & Advanced Learning, Mount Carmel College (Autonomous), Bengaluru, Karnataka, India, Pincode: 560052	India	India
Dr. Renuka C	Assistant Professor, Department of Physics, K.S. Institute of Technology, 41, Raghuvanahalli, Kanakapura Main Road, Bengaluru, Karnataka, India, Pincode: 560109	India	India
Dr. M.S.N.A. Prasad	Assistant Professor, Department of Chemistry, Institute of Aeronautical Engineering (IARE), Dundigal, Hyderabad, Telangana, India, Pincode: 500043	India	India
Dr. D.A. Shahakar	Assistant Professor, Electrical Engineering Department, P.R. Pote (Patil) College of Engineering & Management, Amravati, Maharashtra, India, Pincode: 444602	India	India

Abstract:

A nanofiber-reinforced glass ceramic matrix composite is described, characterized by the integration of nanofibers within a glass ceramic matrix. These nanofibers, meticulously embedded within the matrix, amplify the composite's inherent properties, offering enhanced mechanical strength, improved toughness, and increased thermal stability. The composite's versatility, as demonstrated by its tailorable properties through the adjustment of nanofiber type and orientation, renders it suitable for a plethora of high-performance applications across diverse sectors. The disclosed invention not only represents a significant advancement in material design but also holds the promise of redefining industry standards in various domains.

Complete Specification

Description:The present invention pertains to the domain of materials science and engineering, more particularly to the development, design, and fabrication of composites. Specifically, the invention is concerned with nanofiber-reinforced glass ceramic matrix composites designed for advanced applications where exceptional mechanical, thermal, and environmental properties are crucial. These composites incorporate nanofibers into a glass ceramic matrix, thereby enhancing its inherent properties and making it suitable for a wide range of high-performance applications including but not limited to aerospace, defense, electronics, and energy sectors.

Background of the invention:

The evolution of materials science has continually sought to create materials that provide improved performance characteristics for a broad spectrum of applications. Historically, glass ceramics have been recognized for their superior properties such as low porosity, high strength, and resistance to wear, chemical attack, and high temperatures. However, despite these inherent strengths, there has always been a persistent endeavor to enhance these properties further, especially in terms of mechanical strength, toughness, and thermal stability.

As industries progressed, particularly in sectors like aerospace, defense, and electronics, the demand for materials with extraordinary attributes grew. These advanced applications required materials that could not only withstand extreme conditions but also offer longevity and reliability. For instance, in the aerospace sector, materials that can resist high thermal stresses and exhibit minimal wear even in abrasive environments are paramount. In the electronics domain, materials need to endure high temperatures without compromising on their electrical insulation properties.

Over the years, researchers identified that the integration of reinforcement phases into matrices could offer a potential solution. Traditional reinforcements, such as continuous fibers or particles, were indeed effective, but with the advent of nanotechnology, the possibility of integrating nanoscale reinforcements opened new horizons

View Application Status