|| Jai Sri Gurudev ||

Adichunchanagiri University

BGS Institute of Technology

B G Nagara – 571 448

Department of Mechanical Engineering

YANTHRIK

NEWS LETTER

2023-2024

Institute Vision Mission

VISION

BGSIT is committed to the cause of creating tomorrow's engineers by providing quality education and inculcating ethical values

MISSION

- Imparting quality technical education by nurturing a conducive learning environment.
- Offering professional training to meet industry requirements.
- Providing education with a moral - cultural base and spiritual touch

Program Outcomes (POs)

ENGINEERING KNOWLEDGE : Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PROBLEM ANALYSIS : Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

DESIGN/DEVELOPMENT OF SOLUTIONS : Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS : Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

MODERN TOOL USAGE : Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

THE ENGINEER AND SOCIETY : Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

ENVIRONMENT AND SUSTAINABILITY : Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

ETHICS : Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

INDIVIDUAL AND TEAM WORK : Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

COMMUNICATION : Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PROJECT MANAGEMENT AND FINANCE : Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

LIFE-LONG LEARNING : Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Department of Mechanical Engineering

Vision

Producing competent and sustainable Mechanical Engineers through Excellence, Innovations and Ethics.

Mission

M1: Offering quality Education by competent faculty.
M2: Providing adequate infrastructure and learning ambience.
M3: Developing inclination towards higher education, research, entrepreneurship and professional ethics.
M4: Promoting interaction with industries.

Program Educational Objectives (PEOs)

PEO 1: Graduates will be pursuing successful career & higher education.
PEO 2: Graduates will be able to Design, Analyze, Fabricate & Manage Applications of Mechanical Engineering.
PEO 3: Graduates will display professional ethics to work in a team & lead the team by effectively communicating the ideas.
PEO 4: Graduates will practice lifelong learning.

Program Specific Outcomes (PSOs)

PSO1: Ability to acquire competencies in Designing, Analyzing and Evaluating the Mechanical Components.
PSO2: Ability to work professionally by applying Manufacturing and Management practices.

A CONCISE REPORT ON THE VISIT TO KRISHI MELA (GKVK- 2023) (BENGALURU)

ACU- BGSIT, Department of Mechanical Engineering 5th & 3rd semester students visited the reputed GKVK- Gandhi Krishi Vigyana Kendra during the One Day event on 18th Nov 2023. The students interacted with institute heads, Farmers and could gain knowledge about advancements in Food Millet cutlery, and sericulture cocoon among innovative products available at Krishi Mela-2023 in Bengaluru.

This event showcased many techniques includes innovations is the millet cutlery, where we can use spoons, bowls, and forks which are developed by little millets to improve the food quality and automated agriculture machines along with other advanced food processing equipment. The visit helped students understand food quality and agriculture equipments in the krishi industry context.

A CONCISE REPORT ON THE VISIT OF KRISHI MELA-2023 (GKVK- 2023) (BENGALURU)

Facilitated By
Department of Mechanical Engineering BGS INSTITUTE OF TECHNOLOGY
BG Nagara-571448

Introduction:

With the Divine Blessings of Parama poojya Jagadguru Sri Sri Sri Dr. Nirmalanandanatha Mahaswamiji and Inspirational Perceptions of Dr. B.K. Narendra, Principal and Dean (Engineering and Management), BGSIT, ACU, Department of Mechanical Engineering has arranged One day visit to GKVK-KRISHI MELA-Bengaluru on 18th November 2023. As per the directions of Dr. S.H. Manjunath, HOD, MED, 3 faculty members, viz., Dr. Girish K B, Prof. B.L. Keerthi and Prof. Sharath N of MED along with four Technical staff and 40 students of 5th & 3rd Semester B.E, Mechanical Engineering visited GKVK at 11:00 AM– 3.00 PM and came back to the Campus by College bus by 4:30 PM.

Venue:

GKVK– GANDHI KRISHI VIGYANA KENDRA, Bengaluru

University of Agricultural Sciences Bangalore, a premier institution of agricultural education and research in the country, began as a small agricultural research farm in 1899 on 30 acres of land donated by Her Excellency Maharani Kempa Nanjammanni Vani Vilasa Sannidhiyavaru.

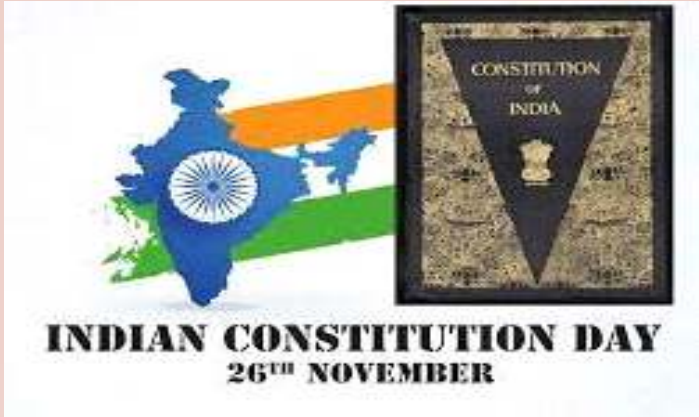
Objective:

The objective of the visit is to explore and understand the research and technology development is being undertaken in the areas of Food, agriculture equipments and Technology and as well some products and machinery developed. The main focus of the event is going to be providing first hand information to farmers about the availability of technology useful to them and also to inform them about the ongoing research activities on various problems of farming.

From this visit, we gathered information's over the working of advanced machines and their applications in the field of agricultural technology and also food industry.

Report of constitution day:

The NSS unit of BGS Institute of Technology, Mechanical Engineering Department has celebrated the Constitution Day (Samvidhan Divas)" on November 27th 2023, at MED Seminar hall, ACU campus. On this occasion, NSS programme officer Mr. Sharath N deliver the Preamble of the Indian Constitution. Around 100 NSS volunteer and teaching and non-teaching staff were present on this occasion.



Achievements of Department

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

सत्यमेव जयते

क्रम सं/SL No :044179652

पेटेंट कार्यालय,भारत सरकार | **The Patent Office, Government Of India**

पेटेंट प्रमाण पत्र | **Patent Certificate**

(पेटेंट नियमावली का नियम 74) | (Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	514375
आवेदन सं. / Application No.	:	202041038830
फाइल करने की तारीख / Date of Filing	:	09/09/2020
पेटेंटी / Patentee	:	Adichunchanagiri University
आविष्कारकों का नाम /Name of Inventor(s)	:	1.Dr. Manjunath SH 2.Dr. Girish KB 3.Dr Ravikumar GK

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *AN ALUMINIUM, BORON & GRAPHITE METAL MATRIX COMPOSITE* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख सितम्बर 2020 के नौवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *AN ALUMINIUM, BORON & GRAPHITE METAL MATRIX COMPOSITE* as disclosed in the above mentioned application for the term of 20 years from the 9th day of September 2020 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 23/02/2024
Date of Grant :

पेटेंट नियंत्रक
Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, सितम्बर 2022 के नौवें दिन को और उसके पश्चात प्रत्येक वर्ष मे उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 9th day of September 2022 and on the same day in every year thereafter.

Colloids and Surfaces C: Environmental Aspects 2 (2024) 100024

Contents lists available at ScienceDirect

Colloids and Surfaces C: Environmental Aspects

journal homepage: www.journals.elsevier.com/colloids-and-surfaces-c-environmental-aspects

Enhanced photocatalytic activity and stability of 2D $Cs_3Bi_2Br_9$ perovskite nanosheets synthesized via modified antisolvent method

Mohamed Masri [a,b,*], K.B. Girisha [b], Abdo Hezam [c], Talal F. Qahtan [d], Khaled Alkanad [e], Faten Masri [f], K. Namratha [g], Udayabhanu [a], Kullaiah Byrappa [a]

[a] Center for Research and Innovations, BGS Institute of Technology, Adichunchanagiri University, B.G. Nagar, Karnataka, India
[b] Department of Mechanical Engineering, BGS Institute of Technology, Adichunchanagiri University, B.G. Nagar, Karnataka, India
[c] Leibniz-Institute for Catalysis, University of Rostock, 18059 Rostock, Germany
[d] Physics Department, College of Science and Humanities in Al-Kharj, Prince Sattam Bin Abdulaziz University, Al-kharj 11942, Saudi Arabia
[e] Department of Studies in Physics, University of Mysore, Manasagangotri, Mysuru, Karnataka, India
[f] Department of Production Engineering, Faculty of Mechanical Engineering, University of Aleppo, Aleppo, Syria
[g] Centre for Materials Science and Technology, University of Mysore, Manasagangotri, Mysuru 570006, India

ARTICLE INFO

Keywords:
Photocatalytic efficiency
Organic pollutants
Photocatalysis
Agglomeration

ABSTRACT

$Cs_3Bi_2Br_9$ perovskite has attracted tremendous research attention in the field of photocatalysis due to its promising light-harvesting properties. However, its practical applications are hindered by water-induced degradation, limiting stability and photocatalytic activity. In this study, we address this challenge by synthesizing stable 2D $Cs_3Bi_2Br_9$ nanosheets through a modified anti-solvent reprecipitation method. Optimizing the isopropanol amount enabled unprecedented synthesis of 2D $Cs_3Bi_2Br_9$ nanosheets. SEM and HRTEM images show 2D stacked nanosheets of the sample prepared using 250 mL of isopropanol, while bulks and agglomerations were noticed in the samples prepared using different amounts of isopropanol. The $Cs_3Bi_2Br_9$ nanosheets exhibits the lowest charge recombination rate, hence achieving the highest degradation ratio of methylene blue, removing ~80 % of the dye within 90 min under visible light attributed to their stability, facilitating efficient charge separation. Our study sheds light on the pivotal role of 2D morphology in enhancing the stability and photocatalytic performance of $Cs_3Bi_2Br_9$.

1. Introduction

It is unnegotiable that the role of solar energy has proved pivotal in tackling environmental problems, including water treatment [1–5]. Recently, photocatalysis has demonstrated many promising effects as an ecofriendly technique [6–8] regarding dye degradation [9] instead of dye transformation under ambient conditions [10,11]. Polluted water remediation using the photocatalytic method requires the utilization of photocatalysts—substances activated by adsorbing a photon and can accelerate the reaction rate without being consumed [12–17]. These substances are called semiconductors, and they are used to generate charge carriers by means of photoelectric effect. Out of the various semiconductors used in the photocatalytic process are perovskite materials that have proved efficient due to their tunable bandgap providing enough redox potential that allows for executing several photocatalytic reactions, such as contaminants degradation [18,19].

Halide perovskites constitute a group of materials with the formula of ABX_3, and they are highly favored by many recent studies as promising photocatalysts because of their unique opto-electronic properties, chemical composition, and controllable band gap structure [20,21]. At the outset, lead-based halide perovskites have shown their outperformance due to their narrow bandgaps compared to traditional semiconductors. However, because of their toxic effects that endanger the ecosystem, lead-free halide perovskites with similar ionic radii to Pb have emerged as promising alternatives with low toxicity [22]. Apart from being cost-effective and less toxic, lead-free materials offer an efficient solution that has the potential to accelerate certain chemical reactions [23]. Considerable effort has been exerted to develop numerous lead-free perovskite nanocrystals (NCs) by utilizing several materials like tin [24,25], bismuth [26–29], and others. Still, a serious issue that hinders the practical applications of lead-free halide perovskites is their poor photocatalytic activity and unsatisfactory stability

* Corresponding author at: Center for Research and Innovations, BGS Institute of Technology, Adichunchanagiri University, B.G. Nagar, Karnataka, India.
E-mail address: mohammedmasri@bgsit.ac.in (M. Masri).

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Metal halide perovskite-based photocatalysts for organic pollutants degradation: Advances, challenges, and future directions

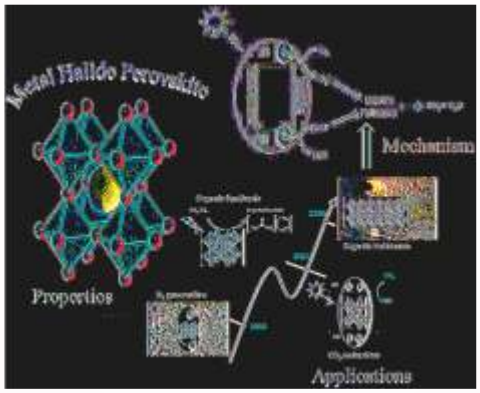
Mohamed Masri [a,b,*], Girisha. K. B [b], Abdo Hezam [c,g], Khaled Alkanad [d], Kalappa Prashantha [a], S.H. Manjunath [b], Udayabhanu [a], Faten Masri [e], Talal F. Qahtan [f], Kullaiah Byrappa [a]

[a] Center for Research and Innovations, BGS Institute of Technology, Adichunchanagiri University, B. G. Nagar, Karnataka, India
[b] Dept. of Mechanical Engineering, BGS Institute of Technology, Adichunchanagiri University, B. G. Nagar, Karnataka, India
[c] Leibniz-Institute for Catalysis, University of Rostock, 18059 Rostock, Germany
[d] Department of Studies in Physics, University of Mysore, Manasagangotri, Mysuru, Karnataka, India
[e] Dept. of Production Engineering, Faculty of Mechanical Engineering, University of Aleppo, Aleppo, Syria
[f] Physics Department, College of Science and Humanities in Al-Kharj, Prince Sattam Bin Abdulaziz University, Al-kharj 11942, Saudi Arabia
[g] Industrial Chemistry and Heterogeneous Catalysis, Department of Chemistry, TUM School of Natural Sciences, Technical University of Munich, 85748 Garching, Germany

HIGHLIGHTS

- Because of their multifunctional properties, MHP-based photocatalysts offer an appropriate choice for water degradation.
- Lead-free perovskites offer a good substitute of their lead-based counterparts due to their ecofriendly properties.
- The stability of MHPs can be improved through the encapsulation of perovskites' quantum dots with stable sol or polymer.
- Perovskites' structure reduces the diffusion pathways of carriers thus boosting the material stability under irradiation.
- Utilizing semiconductor materials with matching energy bands improves the performance of perovskites.

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:
MHP-based photocatalysts
Organic pollutants
Photocatalysis

ABSTRACT

Organic pollutants such as fertilizers, oils, greases, pharmaceuticals, and organic dyes which endanger natural water resources and treated water waste are highly toxic and perilous; therefore, removing such matters prior to drainage into the environment is imperative. Designing technologies for degrading these contaminants have created a challenge to scientists and researchers. A variety of techniques have been utilized to degrade these organic pollutants. Photocatalysis is a promising technique due to its unique physicochemical, optical and electrical properties. In the current review, Metal Halide Perovskite-based photocatalysts employed to drive various reduction and oxidation reactions under light irradiation with suitable wavelengths were highlighted. The photocatalytic fundamentals of MHP-based photocatalysts including the basic mechanism of heterogeneous

* Corresponding author at: Center for Research and Innovations, BGS Institute of Technology, Adichunchanagiri University, B. G. Nagar, Karnataka, India.
E-mail address: mohammedmasri@bgsit.ac.in (M. Masri).

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