KURIAKOSE ELIAS COLLEGE MANNANAM

Affiliated to Mahatma Gandhi University, Kottayam
www.kecollege.ac.in | kecollegemnm@gmail.com

Criterion - III

Research, Innovations and Extension

3.3: Research Publications and Awards

3.3.1.

Documentary Evidence (with Author and Affiliation Details) for the Research Publications

List of Research Papers published in the Journals notified on UGC-CARE list during the assessment years (2018-2023)

Sl. No.	Year	Name of the Author	Name of the Journal	Title of the Paper	Page No.
1	2023	Libin Kuriakose and V.V Ison	Nano LIFE	On the Synthesis of Novel AgInZn2Te4 Quantum Dots Employing a Green Route	**07**
2	2023	Anju Elsa Tom, Ajith Thomas, Ajeesh Kumar Somakumar, Libin Kuriakose, V.V. Ison	Thin Solid Films	Performance enhancement of PbS quantum dot solar cells employing a hybrid solid-state ligand exchange protocol	**08**
3	2023	Maria Jose, Jaiby Joseph, Mercy Mathews	Journal of Physics: Conference Series	A review on synthesis of graphene oxide and its functionalization through ion irradiation methods	**09**
4	2023	Mekha Susan Rajan, Anju John, Minjoong Yoon & Jesty Thomas	Environmental Science and Pollution research	Zeolite Y-supported carbon-doped TiO2 nanocomposites: Efficient solar photocatalysts for the purification of medicinal wastewater	**10**
5	2023	Mathew Maya, Muhammed Afthab, Sreejith S., Sandhya C., Jyothis Mathew & Radhakrishnan E. K.	Applied Biochemistry and Biotechnology	Prevalence of Antimicrobial Resistance Among the Hydrogen Sulfide Producing Bacteria Isolated on XLD Agar from the Poultry Fecal Samples	**11**
6	2023	Radhakrishnan Sivakumar, Kiseong Park, Jesty Thomas, Seok Min Yoon, Minjoong Yoon	Journal of Environmental Chemical Engineering	Solar catalytic CO2 reduction over POM-entrapped zeolites decorated with TiO2 nanocomposites in water: Highly efficient and selective production of CH3OH via Z-scheme charge separation	**12**
7	2023	Mekha Susan Rajan, Anju John and Jesty Thomas	New Journal of Chemistry	Perylene nanoparticle-sensitized MoS2: an efficient solar photocatalyst for the degradation of pollutants	**13**
8	2023	Sujarani Mathew	Assonance:A Journal of Russian & Comparative Literary Studies	When Sita Speaks Pali And Draupadi Tamil: The Politics of Regional Representations	**14**

9	2023	Joby Joseph	Bhairavi	Searching for identity and fulfilment: Re-reading of Achebe's Refugee Mother and Child	**15**
10	2023	Theja Joseph, J. G. Ray	BioEnergy Research	Experimental Assessment of Lipid Yield and Phycoremediation Potential of Five Indigenous Microalgae Under Various Nutrient Regimes	**16**
11	2023	Midhila Baby, Mathews T Thelly	Advances in Zoology and Botany	Antioxidant Anti-inflammatory and Antibacterial Potential of Lyophilized powder of Ziziphus rugosa Lam. Leaf extract (ZLE)	**17**
12	2023	Joby Joseph	Xplore- The Xavier's Research Journal	Post-Humanism Reverberating Through the Select Novels of Jose Saramago: A Philosophical and Epistemological Survey	**18**
13	2023	Joby Joseph	History Research Journal	Myth: A Brief Introduction	**19**
14	2023	Joby Joseph	Humanities and Social Science Studies	Context-Specific and Philosophical Dimensions of Literature	**20**
15	2023	Smitha S., Kattumannil Sudeesh K., E. P. Sreedevi	Communications in Statistics - Theory and Methods	Dynamic cumulative residual entropy generating function and its properties	**21**
16	2022	Ranjini Radhakrishnan, Manoj Parameswaran, K. Satheesh Kumar	Materials Chemistry and Physics	The evolution and recent research trends of Surface Enhanced Raman Scattering sensors using plasmonics: Citation network analysis	**22**
17	2022	Ajimon George, Prajod Sunny	Journal of Financial Services Marketing	Why do people continue using mobile wallets? An empirical analysis amid COVID-19 pandemic	**23**
18	2022	Ajith Thomas , Anju Elsa Tom, V.V. Ison	Energy Reports	An inverted architecture P3HT:CdSe bulk-heterojunction hybrid solar cell utilizing a quantum junction with high open circuit voltage and efficiency	**24**
19	2022	Edithstine Rani Mathew and Lovelymol Sebastian	Jnanabha	Fuzzy Optimization and gH symmetrically derivatives of Fuzzy Function	**25**
20	2022	Joby Joseph	Purana	Quest for Perfection and Complete Identity in Jose Saramago's Novels: A Re-reading of Blindness	**26**

21	2022	Jikku Mariam John, Chinchu Rani Vincent	Indian Journal of Psychological Science (IJPS)	A gender-based study to measure mindfulness and locus of control among sex workers	**27**
22	2022	Anu Mary James, Karthika Elizabeth	Indian Journal of Psychological Science (IJPS)	Different psychological constructs on pet owners during covid-19 pandemic	**28**
23	2022	Mekha Susan Rajan, Anju John, Jesty Thomas	Current Analytical Chemistry	Nanophotocatalysis for the Removal of Pharmaceutical Residues from Water Bodies: State of Art and Recent Trends	**29**
24	2022	Mekha Susan Rajan, Minjoong Yoon, Jesty Thomas	Photochemical & Photobiological Sciences	Kaolin-graphene carboxyl incorporated TiO2 as efficient visible light active photocatalyst for the degradation of cefuroxime sodium	**30**
25	2022	Anju John, Jesty Thomas	International Journal of Environmental Analytical Chemistry	Enhancement of photocatalytic activity of g-C3N4 under solar light by Nd3+ doping and HPA incorporation and its application in the degradation of ceftriaxone sodium	**31**
26	2022	Sujarani Mathew	Journal of English Language Teaching	Implications of Intercultural Communicative Competence in English Language Teaching/Learning in the 21st Century	**32-33**
27	2022	Midhila Baby and Mathews T Thelly	Indian Journal of Natural Sciences	HPTLC finger printing of Sec.metabolites in the aqueous extract of stem bark of Ziziphus rugosa	**34**
28	2021	Sujarani Mathew	Psychology and Education	Education and Cultural Capital as Criteria of Social Mobility: A Socio-Psychological Study in Victorian Literature	**35**
29	2021	Aswathy Maheswaran & Sujarani Mathew	Elementary Education Online	Position of Memes in Trolls: A Linguistic Analysis based on Theory of Humour	**36**
30	2021	Linta Maria Jose, Sunny Kuriakose and Tessymol Mathew	Photodiagnosis and Photodynamic Therapy	Development of Photoresponsive zinc oxide nanoparticle - encapsulated lignin functionalized with 2-[(E)-(2-hydroxy naphthalen-1-yl) diazenyl] benzoic acid: A promising photoactive agent for antimicrobial photodynamic therapy	**37**

31	2021	Mareena Eappen & Sujarani Mathew	Kala Sarovar	Trauma among Women in War Torn Nigeria	**38**
32	2021	Jacquiline Thankachan, Mitha Babu	Journal of emerging technologies and innovative research (JETIR)	Role of spiritual intelligence on Resilience and Mental health	**39**
33	2021	Anoop Vijayan, V.Chithra, C.Sandhya	International Journal of Cardiology Hypertension	The relationship of lipid peroxidation and antioxidant status to selected modifiable risk factors in coronart artery disease patients	**40**
34	2021	Ajimon George, Prajod Sunny	IIM Kozhikode Society & Management Reveiw	Developing a research model for mobile wallet adoption and usage	**41**
35	2020	Anju John, Mekha Susan Rajan, Jesty Thomas	Environmental Science and Pollution Research	Carbon nitride-based photocatalysts for the mitigation of water pollution engendered by pharmaceutical compounds	**42**
36	2020	Radhika S, Jesty Thomas	Indian Journal of Advances in Chemical Science	Degradation of Endocrine Disruptors using Modified TiO2 Nanorods under Sunlight	**43**
37	2020	Sujarani Mathew	Journal of Literature & Aesthetics	Transcendentalism and East West Intertexts: A Coss-sectional Analysis of Indian and Western Literary Criticism	**44-45**
38	2020	Sujarani Mathew	LITTCRIT	Lacanian Narcissism in Text: A French Feminist Overview of Kamala Das's Oeuvre	**46**
39	2020	Ann Mary Philip, Sunny Joseph Kalayathankal, and Joseph Varghese Kureethara	AIP Conference Proceedings 2236, 060005-1 to 060005-8	On Interval Valued Fuzzy Graphs Associated with a Finite Group	**47**
40	2020	K. S. Ambili, Jesty Thomas	Journal of Porous materials	Synthesis of hybrid materials by immobilizing paraaminobenzoic acid complexes of Eu3+ and Tb3+ in zeolite Y and their luminescent properties	**48**
41	2020	Linta Maria Jose, Sunny Kuriakose, Sabu Thomas	BioNanoScience	Fabrication, Characterization and In Vitro Antifungal Property Evaluation of Biocompatible LigninStabilized Zinc Oxide Nanoparticles Against Selected Pathogenic Fungal Strains	**49**

42	2020	Divya Joseph, Mathew Jacob	Tathapi	Role of Responsible Tourism in Economic Development: A Systematic Review of Literature	**50**
43	2019	E.M. Suji, Sunny Joseph Kalayathankal	Think India Journal, 22(14) 9341- 9351	Topological Indices: Study of a Chemical Molecular Structure	**51**
44	2019	Sajan Mathew, John T Abraham, Sunny Joseph Kalayathankal	Think India Journal, 22(14) 9380- 9384	Data Mining Applications in Higher Education and Innovation Advancements	**52**
45	2019	Ann Mary Philip, Sunny Joseph Kalayathankal, Joseph Varghese Kureethara	AIP Conference Proceedings, 2095, 030002	Characterization of interval-valued fuzzy bridges and cutnodes	**53**
46	2019	Ann Mary Philip, Sunny Joseph Kalayathankal, Joseph Varghese Kureethara	Malaya Journal of Matematik 7(2), 309-313	On Different kinds of arcs in interval valued fuzzy graphs	**54**
47	2019	Sunny Joseph Kalayathankal, John T. Abraham, and Joseph Varghese Kureethara	AIP Conference Proceedings 2080, 050004	A fuzzy computing software quality model	**55**
48	2019	Jaiby Joseph	Physical Review C 101, 014616 (2020)	Evaporation-residue-gated spin distribution measurements of the highly fissile compound nucleus Th*224 through O16+Pb208 and O18+Pb206 reactions	**56**
49	2019	Janey Mary Mathew, Varughese Philip, Jesty Thomas	Asian Journal of Chemistry	Synthesis, Spectroscopic Characterization, Antibacterial and Short Term in vitro Cytotoxicity Studies of Copper (II) Complexes of Novel Tridentate N,N,S-donor Ligand 2-benzoylpyridine-N(4),N(4)-(N,N-diethyl-N-methylamine-2,2'-diyl) thiosemicarbazone	**57**
50	2019	Janey Mary Mathew, Jesty Thomas	International Journal of Research and Analytical Reviews	Short term in vitro cytotoxicity studies of Zn (II) complexes of a tridentate N,N,S-donor thiosemicarbazone ligand, Hbptsc synthesized from 2-benzoylpyridine and Piperazine Base	**58**

51	2019	Linta Maria Jose, Sunny Kuriakose	Macromolecular Research	Photochemical studies and Photoinduced Antibacterial Properties of Silver-Nanoparticle Encapsulated Biomacromolecule Bovin Serum Albumin Functionalised with Photoresponsive Chromophoric System 2-[E-3 Hydroxynaphthalen-2-yl] Benzoic Acid	**59**
52	2019	Smitha S., G. Rajesh, Baby A. K.	Think India Journal	On Dynamic Cumulative Past Entropy Generating Function	**60**
53	2018	Jesty Thomas, Ambili K.S, Radhika	Catalysis Today	Synthesis of Sm3+-doped Graphitic Carbon Nitride Nanosheets for the Photocatalytic Degradation of Organic Pollutants under Sunlight	**61**
54	2018	Jesline Maria Mamen	IAHRW International Journal of Social Sciences Review	Happiness and Performance at Work	**62**
55	2018	Kevin Abraham, A.K. Thomas, Jini Thomas, K.V. Saban	Materials Today: Proceedings	Attractive dielectric responses with doping of Cr3+ and Ti4+ in Sm1.5Sr0.5NiO4 ceramics	**63**
56	2018	A.K. Thomas, Kevin Abraham, Jini Thomas, K.V. Saban	IOP Conf. Series: Materials Science and Engineering	Origin of the high dielectric constant in Sm2/3Cu3Ti4O12 ceramics	**64**

Prof. Dr. Ison V. Vanchipurackal

PRINCIPAL
KURIAKOSE ELIAS COLLEGE
MANNANAM, KERALA-686 561

Nano LIFE
Vol. 13, No. 1 (2023) 2350001 (8 pages)

DOI: 10.1142/S1793984423500010

World Scientific
www.worldscientific.com

On the Synthesis of Novel $AgInZn_2Te_4$ Quantum Dots Employing a Green Route

Libin Kuriakose* and V. V. Ison†,‡
*Department of Physics
Centre for Nano Bio Polymer Science and Technology
St. Thomas College, Palai Arunapuram
Kottayam 686574, Kerala, India
†Research and PG Department of Physics
Kuriakose Elias College
Mannanam, Kottayam 686561, Kerala, India
‡isonv@rediffmail.com

Received 24 October 2022
Accepted 10 December 2022
Published 6 February 2023

We report the synthesis of novel quaternary $AgInZn_2Te_4$ quantum dots (QDs) utilizing organometallic hot injection procedures. By using octadecene and oleylamine as the coordinating solvents and dodecanethiol as the capping ligand, we could arrive at a phosphine-free "green route" for the synthesis. Detailed characterizations were performed using high resolution transmission electron microscopy (HRTEM), selected area electron diffraction (SAED) X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), inductively coupled plasma-optical emission spectroscopy (ICP-OES), energy dispersive X-ray spectroscopy (EDX), UV–Vis spectroscopy, and Photoluminescence (PL) spectroscopy for the structural, compositional, and optical analyses. The nanostructures were spherical, monodisperse, highly crystalline with cubic structure, and having an average diameter of 6.5 ± 0.5 nm with optical features in the visible region.

Keywords: Quantum dots; colloidal synthesis; $AgInZn_2Te_4$; quaternary quantum dots; phosphine free synthesis; green synthesis.

1. Introduction

Colloidal quantum dots (QDs) have embellished a locus in the scientific world because of their revolutionary innovations and advancements in various fields, especially in light emitting diodes,[1–3] liquid crystal displays,[4,5] photovoltaic,[6,7] photoconductors,[8] photodetector,[9] bioimaging,[10] diagnostics,[11] biosensing application,[12] biolabeling,[13] cancer detection,[11,14] optical imaging,[15,16] photocatalytic and lasers,[17,18] due to their size and shape-tunable optical properties and their cost-effectiveness.[19–22] Large degrees of freedom in controlling the size and composition and the flexibility in altering the shape furnishes novel physical and chemical properties in these quantum systems.[23–25] It is known that the photochemical characteristics of QDs are primarily governed by quantum confinement effects which have led to several scientific explorations.[26,27] Colloidal procedures are adopted in our studies that involve injecting part of the precursors in appropriate

‡Corresponding author.

ScienceDirect

Thin Solid Films

Volume 787, 31 December 2023, 140138

Performance enhancement of PbS quantum dot solar cells employing a hybrid solid-state ligand exchange protocol

Anju Elsa Tom [a b], Ajith Thomas [a c], Ajeesh Kumar Somakumar [d], Libin Kuriakose [a e], V.V. Ison [a f]

[a] Centre for Nano-Bio-Polymer Science and Technology, Research and PG Department of Physics, St. Thomas College, Palai, Kerala 686574, India
[b] Department of Physics, St. Aloysius College, Elthuruth, Thrissur, Kerala 680611, India
[c] Department of Physics, Nirmala College, Muvattupuzha, Kerala 686661, India
[d] Institute of Physics, Polish Academy of Sciences, Aleja Lotnikov 32/46, Warsaw 02-668, Poland
[e] Department of Physics, St. Thomas College, Palai, Kottayam, Kerala 686574, India
[f] Research and PG Department of Physics, Kuriakose Elias College, Mannanam, Kerala 686561, India

Received 22 July 2023, Revised 8 November 2023, Accepted 19 November 2023, Available online 21 November 2023, Version of Record 25 November 2023.

What do these dates mean?

Check for updates

https://doi.org/10.1016/j.tsf.2023.140138

Get rights and content

6th National Conference on Advanced Materials and Radiation Physics (AMRP 2023) IOP Publishing
Journal of Physics: Conference Series **2663** (2023) 012016 doi:10.1088/1742-6596/2663/1/012016

A review on synthesis of graphene oxide and its functionalization through ion irradiation methods

Maria Jose, [1 a)] Jaiby Joseph[2 b)] and Mercy Mathews[3 c)]

[1]Research and Post graduate Department of Physics, St. George's College, Aruvithura, Kerala, India
[2,3]Research and Post graduate Department of Physics, Kuriakose Elias College Mannanam, Kerala, India

[a)]maria@sgcaruvithura.ac.in, [b)]jjoseph@kecollege.ac.in,
[c)]mercymathews@kecollege.ac.in

Abstract. Graphene is a monoatomic layer of sp^2 hybridized carbon atoms, which is two-dimensional and has unique electrical, magnetic and mechanical properties. Pristine graphene is inert in nature and limited in its applications. Doping can enhance the properties of graphene. Several efforts have been done recently to tune its properties through doping, which will provide precise control over its structure and properties. In this review, different methods of doping graphene especially chemical versus irradiation methods and their effects are summarized. Moreover, the advantages of ion irradiation techniques in doping are also discussed based on the available experimental results.

1. Introduction

Since the time of its inception, graphene has undergone extensive research due to its unique properties and varied applications. Graphene has light weight, large surface area, high electrical conductivity, tunable thickness, good mechanical property as well as one atom thickness. Graphene is a honeycomb lattice formed by sp^2 hybridized, in plane carbon atom bonds and an out-of-plane πbond. The out-of-plane πbond causes weak interactions between graphene layers. Reduced Graphene Oxide (rGO), is a processed form of GO which is widely used in graphene batteries because of the large surface area it offers. However, there is a limitation in its application as a current collector because of its low conductivity. The electron density and conductivity can be improved by doping the rGO with heteroatoms (nitrogen, boron, phosphorus etc.). Thus, functionalizing GO can realize remarkable performance. Functionalizing GO by adding new chemical groups is preferred over functionalizing through covalent interactions because, it preserves the electronic properties and morphology of graphene. Heteroatom doping, edge functionalization and structural defects are some of the functionalization techniques for the synthesis of graphene-based materials for batteries. Thus, functionalized graphene coated electrode materials can provide short path length for electron/ion transportation, more surface area between electrodes and electrolyte and unique electrochemical reactions that would be impossible with its bulk size equivalents and these properties are crucial in energy storage devices [1].

The features of undoped graphene may not be suitable for certain surface property-based applications in storage devices. Thus, graphene and GO are modified by non-covalent

Environ Sci Pollut Res Int. 2023 May;30(21):60638-60653. doi: 10.1007/s11356-023-26768-x. Epub 2023 Apr 10.

Zeolite Y-supported carbon-doped TiO_2 nanocomposites: Efficient solar photocatalysts for the purification of medicinal wastewater

Mekha Susan Rajan [1], Anju John [1], Minjoong Yoon [2], Jesty Thomas [3]

Affiliations

Affiliations

1 Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala, 686561, India.
2 Department of Chemistry, Chungnam National University, Daejeon, 34134, Republic of Korea.
3 Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala, 686561, India. jestyk@kecollege.ac.in.

PMID: 37036645 DOI: 10.1007/s11356-023-26768-x

Abstract

The existence of antibiotics in aquatic streams destroys water quality and thereby poses serious ecological hitches. Photocatalysis involving nanosemiconductors is an environmentally benign technique for the mineralization of antibiotics. Herein, we prepared a new visible light-sensitive photocatalyst, zeolite Y-supported carbon-doped TiO_2 nanocomposite (zeolite Y-c-TiO_2), for the elimination of cefazolin antibiotic in wastewater systems. The structural and optical properties of the synthesized nanocomposites were investigated by Fourier transform infrared spectroscopy (FT-IR), powder X-ray diffraction analysis (XRD), scanning electron microscopy (SEM), energy-dispersive X-ray analysis (EDX), transmission electron microscopy (TEM), X-ray photoelectron spectroscopy (XPS), and Brunauer-Emmett-Teller surface area analysis (BET) as well as diffuse reflectance spectroscopy (UV-DRS) and photoluminescence spectroscopy (PL). The UV-Vis absorbance spectrum of zeolite Y-c-TiO_2 exhibited a red shift towards longer wavelength with an increase in visible light absorption as compared to pure TiO_2 nanoparticles and zeolite Y-supported TiO_2 nanocomposites (zeolite Y-TiO_2). Accordingly, the photocatalytic action of the zeolite Y-c-TiO_2 for the degradation of methylene blue was evaluated under solar simulator, and it turned out to be highly efficient (100%) mineralization as compared to TiO_2-nanoparticles (42%) and zeolite Y-TiO_2 (62%) after 70 min irradiation for a 50mg L^{-1} methylene blue solution. Radical scavenging experiments revealed the involvement of hydroxyl radicals, superoxide radicals, and photogenerated holes in the degradation process. Consequently, zeolite Y-c-TiO_2 was applied for the photocatalytic degradation of the cefazolin antibiotic in water, and complete degradation of cefazolin (50 mg L^{-1}) was observed within 6 h of solar light irradiation on zeolite Y-c-TiO_2. The degradation pathway of cefazolin was proposed by considering various intermediates detected via LC-MS analysis. The study points to the significant potential of zeolite Y-c-TiO_2 photocatalyst for the purification of medicinal wastewater under sunlight.

Keywords: Dyes; Medicine; Solar photocatalysis; Wastewater purification; Zeolite Y-c-TiO2 nanocomposites.

Appl Biochem Biotechnol. 2024 Apr;196(4):2318-2331. doi: 10.1007/s12010-023-04633-4. Epub 2023 Aug 4.

Prevalence of Antimicrobial Resistance Among the Hydrogen Sulfide Producing Bacteria Isolated on XLD Agar from the Poultry Fecal Samples

Maya Mathew # [1], Muhammed Afthab # [1], Sreejith S [1], Sandhya C [2], Jyothis Mathew [1], Radhakrishnan E K [3]

Affiliations

Affiliations

1 School of Biosciencess, Mahatma Gandhi University, Kottayam, Kerala, 686560, India.
2 Department of Biochemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala, 686561, India.
3 School of Biosciencess, Mahatma Gandhi University, Kottayam, Kerala, 686560, India. radhakrishnanek@mgu.ac.in.
# Contributed equally.

PMID: 37540287 DOI: 10.1007/s12010-023-04633-4

Abstract

Poultry products remain as one of the most popular and extensively consumed foods in the world and the introduction of hydrogen sulfide (H_2S) producing antibiotic resistant bacterial species into it is an emerging challenge. The current study has been designed to analyze the distribution of antibiotic resistance among the H_2S producing bacteria isolated from the fecal samples of chickens from different poultry farms. Here, twenty bacterial isolates were selected based on their ability to produce H_2S on XLD agar, and the16S rDNA sequencing was carried out for their molecular identification. The results showed the isolates as belong to Salmonella spp. and Citrobacter spp. and in the antibiotic susceptibility test (AST), three of the Salmonella strains were found to be resistant to antibiotics such as tetracycline, doxycycline, nalidixic acid, and amikacin. Also, fourteen Citrobacter strains showed resistance towards azithromycin, and furthermore, eleven of them were also resistant to streptomycin. Resistance towards tetracycline was observed among five of the Citrobacter strains, and seven were resistant to doxycycline. Further molecular screening by the PCR has showed three of the Salmonella strains along with eight Citrobacter isolates to have tetA gene along with four of the Citrobacter strains to have co-harbored bla_{TEM} gene. The results on biofilm formation have also demonstrated three Salmonella strains along with nine Citrobacter strains to have the ability to form moderate biofilm. The study thus describes the occurrence of H_2S producing multidrug-resistant bacteria in poultry feces, which might contribute towards the dissemination of antibiotic resistance genes to other microorganisms including human pathogens with likely risk to treat disease conditions.

Keywords: Antimicrobial resistance; Biofilm formation; Hydrogen sulfide-producing bacteria; Poultry; Tetracycline.

ScienceDirect

Journal of Environmental Chemical Engineering

Volume 12, Issue 2, April 2024, 112052

Solar catalytic CO_2 reduction over POM-entrapped zeolites decorated with TiO_2 nanocomposites in water: Highly efficient and selective production of CH_3OH *via* Z-scheme charge separation

Radhakrishnan Sivakumar [c], Kiseong Park [a], Jesty Thomas [d], Seok Min Yoon [b] ✉, Minjoong Yoon [a] ✉

[a] Molecular/Nano Photochemistry and Photonics Lab, Department of Chemistry, Chungnam National Universiy, Daejeon 34134, Republic of Korea

[b] Department of Chemistry, Gyeongsang National University, Jinju 52828, Republic of Korea

[c] Department of Chemistry, Thiagarajar College of Engineering, Madurai 625 015, India

[d] Department of Chemistry, Kuriakose Elias College, Mannanam 686561, India

Received 20 October 2023, Revised 17 January 2024, Accepted 25 January 2024, Available online 29 January 2024, Version of Record 2 February 2024.

What do these dates mean?

Editor: Jose Solla-Gullon

Check for updates

https://doi.org/10.1016/j.jece.2024.112052

Get rights and content

Issue 3, 2023

From the journal:
New Journal of Chemistry

Perylene nanoparticle-sensitized MoS_2: an efficient solar photocatalyst for the degradation of pollutants

Mekha Susan Rajan,[a] Anju John[a] and Jesty Thomas[*a]

Author affiliations

* Corresponding authors

[a] Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala, India

E-mail: jestyk@kecollege.ac.in

Fax: +91 481-2732278

Tel: +91 9447779496

Abstract

The usage of visible light active semiconductor photocatalysts for the deterioration of persistent organic pollutants is a hopeful practice, which has captivated substantial consideration. In this work, perylene nanoparticle-incorporated MoS_2 nano photocatalysts (PeNPs-MoS_2) were synthesized and utilized for the degradation of methylene blue (MB), rhodamine B (RhB) and crystal violet (CV) dyes under sunlight. Perylene nanoparticles were prepared using a chemical reduction method involving perylene-3,4,9,10-tetracarboxylic dianhydride (PTCDA) as the precursor and sodium borohydride ($NaBH_4$) as the reducing agent. An upsurge in the photocatalytic degradation of dyes (MB, RhB, and CV) in aqueous solution under solar irradiation was detected for PeNPs-MoS_2, when compared with that of pure MoS_2. The improved separation between photo-induced charge carriers was evident from the

WHEN SITA SPEAKS PALI AND DRAUPADI TAMIL: THE POLITICS OF REGIONAL REPRESENTATIONS

Anu Jose

Assistant Professor, Department of English, Alphonsa College Pala

Sujarani Mathew

Assistant Professor, Department of English, K E College Mannanam

***Abstract**: Epic retellings are instrumental in liberating a cultural phase from the normalcies of a bygone era by destructing discourses of the past by constructing new discourses. By challenging, subverting or negating the knowledge system of yester years manifested through the myths and legends of the cultural group, modern writers give new cultural colouring to the tales once told, images once created, representations once fashioned and knowledge once established. This paper attempts to trace out the diverse representations of Sita and Draupadi shaped by different socio-cultural and spatio-temporal currents. Regional versions of the Ramayana are Sitayanas in spirit and content for such representations offer a counter narrative to the much acclaimed patriarchal rendering of Valmiki Sita. The regional retellings the Mahabharata are Draupadi Mahabharata ,of the goddess of vengeance, who relentlessly fought for her space negating all the patronymic names, declaring herself as the queen of the palace of illusion.*

His-story tells that man always had a fascination for stories. Even when our race was nomadic, we eased our tiring days of labour with the soothing balm of stories, stories of Gods, goddesses, the wicked and the virtuous, coloured by the taste and culture of our times. Being a group overawed by the magnificence of nature, our race framed stories where nature expressed its omniscience and omnipotence. Later, as time passed by, nature got replaced by culture and the cultured human being became the omnipotent. This transit paved way for the birth of epics, where his-story got narrated with sound and fury. Whether it is *The Iliad* or *The Odyssey*, The *Ramayana* or The *Mahabharata*, the treatment of theme remained same, projecting the flawed but omniscient human being.

Literature in general and epic in particular are the products of the culture to which it belongs, since literary representations are shaped by culture and history. Culture

Bhairavi
भैरवी

ISSN No. 0975-5217
(UGC-CARE Listed Group-I)

SEARCHING FOR IDENTITY AND FULFILMENT: RE-READING OF ACHEBE'S REFUGEE MOTHER AND CHILD

Joby Joseph
Assistant Professor, Department of English, Kuriakose Elias College, Affiliated to M.G. University, Kottayam, Kerala-686561

Abstract:
The biggest challenge to human conscience posed by the twentieth century is the astounding rise in poverty in the midst of prosperity. Economists, political theorists, religious leaders, and ideological leaders have challenged the explanation for the rising wealth accumulation in the hands of a shrinking few in the face of a growing dehumanisation of the people. In academic discussions on poverty, the fundamentally human aspect of injustice committed by man against other people is frequently overlooked in favour of economics and statistics. The poet does a good job of articulating and illuminating the importance of poverty. In his poem Refugee Mother and Child, Albert Chinualumogu Achebe describes the malnutrition and poverty experienced by refugees. The theme of the poem is a mother who has been forcibly uprooted together with her child, who persevere in the face of need. In the end, her child passes away, leaving her feeling useless, defenceless, and unhappy as a mother. Achebe incorporates love, lament, spirituality, perseverance, memories, anguish, and transformation into the lives of the mother and child of the outcasts in the poem. The devastating effects of colonialism nearly brought down numerous African countries. These nations endured civil wars, chaos, and brutality even after attaining independence. People were forced to live as refugees in their own country without access to food or water. However, the poem, which was written in the late 1960s, portrays an empathetic image of a mother and her child living in a camp for immigrants. The poem is a tribute to his memories of growing up in poverty with underprivileged children and being influenced by their psychological characteristics.
Keywords: Refugee camp, Colonialism, Africa, Poverty, Population, Catastrophe, Nigeria

Introduction

Political elite representation among African intellectuals suggests that politics has had a big influence on African literature. The writer is a touchy matter in his society. As a result, African literature frequently reflects the political developments on the continent. Chinua Achebe is a great illustration. His writings cover the various political upheavals that Nigeria has seen, starting with the colonial era. More than any other Nigerian novelist, he has also advocated for the role of the writer in society. Therefore, his perception of the writer's obligation has changed radically in tandem with the political climate in his country. The readers may gain an interesting picture of how the depth of a writer's political commitment can have a direct influence on the quality of literature by looking at both his creative work and his utterances. In a speech titled "The Role of the Writer in a New Nation" given to

BioEnergy Research
https://doi.org/10.1007/s12155-024-10722-x

Experimental Assessment of Lipid Yield and Phycoremediation Potential of Five Indigenous Microalgae Under Various Nutrient Regimes

Theja Joseph[1,2] · J. G. Ray[3]

Received: 11 September 2023 / Accepted: 17 January 2024

Abstract
The current study examines the phycoremediation potential cum biomass productivity and biomass quality of hitherto uninvestigated five algae in Bold's Basal Medium (BBM) of varying nitrogen (½ to 4×N), phosphorus (½ to 4×P), and both together (½ to 2×NP) with varying N:P. All five algae displayed unique responses in biomass productivity, lipid yield and productivity, and nitrogen (N) and phosphorous (P) removal efficiency. *Chlorolobion braunii* exhibited the highest biomass productivity (107 to 109.23 mg/L/ day) in N-rich media (3 to 4×N in BBM), and *Monoraphidium contortum* exhibited the highest biomass productivity (103.66 mg/L/day) in P-rich media (2 to 4×P in BBM). All the algae exhibited a higher lipid yield and productivity in BBM with a reduced ratio of N:P (0.85 to 1.47) from a lesser addition of N (½×N or NP in BBM). *Monoraphidium contortum* exhibited significantly higher lipid yield (44.38%) and productivity (35.94 mg/L/day) than other species. The lipid content of four species demonstrated high-quality biofuel properties. *Halochlorella rubescens* exhibited the maximum nitrogen removal efficiency of 96% (in BBM), and *Monoraphidium contortum* exhibited the maximum phosphorus removal efficiency of 94.4% (2×NP in BBM). Overall, the experiments stand as a model for understanding the influence of variations in N and P concerning N:P on biomass productivity, lipid content, lipid productivity, and N and P removal rate and efficiency of algae for initial standardization of the culture protocols for further industrial trials.

Keywords Biofuel · Biodiesel · Biomass quality · Green algae · Lipid yield · Lipid profile · Nutrient removal

Introduction

The utilization of biomass is significant in achieving sustainable development globally. Microalgae, as fast-growing aquatic unicellular organisms, are the fastest-producible biomass resource per unit of time and space with the least minimum external inputs [1]. The uniqueness of microalgal biomass is that it is a multipurpose resource. Many microalgae species effectively convert the absorbed carbon into a lipid-rich biomass feedstock for biofuel [2, 3] or other valuable products [4, 5]. The significance of generating microalgal biomass for biofuel is that while it enables neutral or negative carbon emission in controlling global warming [6], it also helps the simultaneous reclamation of wastewater [7] and the recovery of the lost valuable nutrients leached out into waters [8–10]. Thus, industrial microalgal production can be a multi-edged technology for overcoming both the global economic and environmental crisis [4]. Such microalgal production systems can solve the current freshwater crisis [11] and biomass shortage effectively at global scales. Accordingly, microalgae can be considered a biotechnological (or an ecotechnological) tool for solving future fuel, food, medicine, and pollution crises in the world.

Microalgae, especially many species of freshwater green microalgae, are well known for their high lipid content and high biomass yield [12]. However, the discovery of such unique species or their specific strains adapted to specific ecological habitats [13] is significant in ensuring microalgal industrial development locally and globally. Bloomed waters

✉ J. G. Ray
jgray@mgu.ac.in

1 Laboratory of Ecology and Ecotechnology, School of Biosciences, Mahatma Gandhi University, Kottayam, Kerala 686560, India

2 Department of Botany, Kuriakose Elias College, Mannanam, Kottayam, Kerala 686561, India

3 School of Biosciences, Mahatma Gandhi University, Kottayam, Kerala 686560, India

Published online: 23 January 2024

Advances in Zoology and Botany 11(5): 375-383, 2023
DOI: 10.13189/azb.2023.110505

http://www.hrpub.org

Antioxidant, Anti-inflammatory and Antibacterial Potential of Lyophilized Powder of *Ziziphus rugosa* Lam. Leaf Extract (ZLE)

Running Title: Antioxidant Anti-Inflammatory and Antibacterial Potential of ZLE

Midhila Baby, Mathews T. Thelly*

Department of Botany, Kuriakose Elias College, Mannanam, India

Received September 24, 2022; Revised December 16, 2022; Accepted December 28, 2022

Cite This Paper in the Following Citation Styles

(a): *[1] Midhila Baby, Mathews T. Thelly , "Antioxidant, Anti-inflammatory and Antibacterial Potential of Lyophilized Powder of Ziziphus rugosa Lam. Leaf Extract (ZLE)," Advances in Zoology and Botany, Vol. 11, No. 5, pp. 375 - 383, 2023. DOI: 10.13189/azb.2023.110505.*

(b): *Midhila Baby, Mathews T Thelly (2023). Antioxidant, Anti-inflammatory and Antibacterial Potential of Lyophilized Powder of Ziziphus rugosa Lam. Leaf Extract (ZLE). Advances in Zoology and Botany, 11(5), 375 - 383. DOI: 10.13189/azb.2023.110505.*

Abstract In the present investigation, an attempt was made to determine the therapeutic potential of ethnomedicinal plant *Ziziphus rugosa* Lam. leaf extract (ZLE) as an antioxidant, anti-inflammatory and antibacterial drug. Analytically, it was noticed that, the lyophilized powder has a significant quantity of total phenols (122 mg/g ZLE powder), flavonoids 157.19 mg/g ZLE powder), and flavonol (214.93 mg/g ZLE powder) contents. The antioxidant assays revealed a remarkable capacity to scavenge free radicals. For 100 µg of ZLE powder, the assay value showed a scavenging potency at levels of 73.01% for DPPH(1,1-diphenyl-2-picrylhydrazyl) and 43.80% for NO_X (Nitric Oxide), assays respectively. The ability of the ZLE for H_2O_2 scavenging was assessed using peroxidase assay. 100µg of ZLE powder inhibited albumin denaturation at a level of 27.64% and proteinases by 39.47%. The inhibition by standard drug aspirin (100µg) on albumin denaturation and proteinases was 84.70% and 51.71% respectively. ZLE lyophilized powder was tested for its ability to inhibit the growth of three common wound infecting bacteria- *Pseudomonas aeruginosa, Klebsiella pneumoniae and Staphylococcus aureus.* The inhibition zones formed were compared to the inhibition zones formed by the standard drug cefotaxime (30 mcg/disc) and the Minimum Inhibitory Concentration (MIC) values of ZLE against test organisms were determined.

Keywords ZLE, Polyphenolics, Antioxidant Activity, Anti-Inflammatory, Free Radical Scavenging, Albumin Denaturation, Proteinases, Minimum Inhibitory Concentration (MIC)

1. Introduction

Medicinal plants are the source of numerous bioactive compounds many of which have the potential to be developed into powerful drugs. Isolation and purification of these bioactive compounds by screening and exploring traditional medicinal plants provides a base for further pharmacological studies [1]. Several active principles of many medicinal plants have been identified and presented as important drugs in modern medical systems with the aid of novel phytochemical techniques.

During the metabolic process, the body generates a huge number of reactive oxygen species (ROS) such as superoxide anions, hydroxy radicals, and hydrogen

ISSN no. 2249 - 1878

Post-Humanism Reverberating Through the Select Novels of Josê Saramago: A Philosophical and Epistemological Survey

Fr. Dr. Joby Joseph,
Assistant Professor,
Department of English, K.E. College,
Affiliated to M.G. University, Kottayam, Kerala

Abstract

The Portuguese novelist and playwright, Jose Saramago utilizes allegorical language, experimental writing styles, and creative methodologies to suit his topics. His composing draws in a wide scope of onlookers or viewers everywhere throughout the world, including Portuguese observers. In excess of an imaginative author, he is portrayed as an unadulterated individual in heart and mind with an inventive understanding and empathetic concerns. For him, the human being is superior to religion and institutions. His ideological missionary task is to edify and light up the globe with humanistic and progressive contemplations, and he has a keen insight into Portuguese society. However, there is a philosophical and epistemological conscientization in his novels like 'Blindness' and 'The Gospel According to Jesus Christ'. Moreover, his task is portrayed as judicious, intuitive and acute. His visionary motif seems to represent his perspicacious and shrewd attitude to transform society. The paper highlights the post-humanistic doctrines and thought patterns inherent in the select novels of Jose Saramago.

Keywords: Humanism, Post-humanism, Multidimensionality, Humanity, Compassion, Interpretation, Atheism

Introduction

Humanism mainly focuses on reason and science to explicate all the mysteries inherent in life one way or the other i. As per the principle of humanism, all belief patterns must be scrutinized to the brimii. The very concept of humanism is extremely difficult to define but there are certain common features that are synonymous with humanistic principles as a whole. Before wading into the midst of those principles related to humanism, the concept of post-humanism must be unveiled without further delay. Here, nothing is exempted from a thorough examination. But when it comes to post-humanism, the reason is causality; here reason does have an innate value when it is only integrated with emotional vibesiii. Even probing something in the light of reason is discounted. For example, in the novel Blindness, it is reasonable to quarantine people having the disease of blindness in a detention camp but as per post-humanism, such reasoning doesn't cut much ice because even such detention is not good enough to prevent the disease of blindness because it is a disease born out of perception and imposition rather than humanly constituted.

The principle of humanism does have a multidimensionality of meanings within its very framework. The plain explanation that can be given with respect to the concept of humanism is that it is wholly concerned with human values, interests, and dignity of human beings in generaliv. If humanism is all about human values, interests, and dignity, then post-humanism is all about going beyond that to pinpoint occasions which do spill over into the domain of inhumane pedigrees at the initial instances. But upon closer analysis, there is a

History Research Journal
ISSN : 0976-5425 (P)
Volume: 29, Issue: 06, No.7, November – December : 2023

MYTH: A BRIEF INTRODUCTION

(Dr.) Fr. Joby Joseph, Assistant Professor, Department of English, Kuriakose Elias College, Affiliated to M.G. University, Kottayam-686561. jhobu@yahoo.co.in; 9496546707

ABSTRACT

The terms myth and mythology are used in the study of religion and culture to refer to stories about gods or other supernatural creatures as well as extraordinary occurrences or events in a period that is very different from modern times. Myth, a general word for one type of symbolic communication, denotes a particular fundamental form of religious symbolism, as opposed to other symbolic activities like cult and ritual and other symbolic locations and things like shrines and idols. The term mythology refers to the study of myths and the corpus of myths within a certain religious tradition. Science, religion, society, psychology, and even the arts are all subject to myth in human civilization. Eschatology and destruction, cultural heroes and soteriological figures, time and eternity, providence and ultimate fate, rebirth and renewal, even memory and forgetting are among the major categories of myths. The essay evaluates myth in contemporary culture, taking into account its decentralization, the demythologization of major religious traditions, and even its usage in social and political discussion. In contemporary Western culture, myth has become an indispensable point of reference. In order to address the utilization of myth as a research method, this paper examines the term and genre myth from the standpoint of traditional studies. The study demonstrates how different uses of myth are discussed in both public and academic contexts.

Keywords: Religious framework, Literary work, Human existence, Mysticism, Eternal struggle, Global metaphors.

Introduction

The word myth has encyclopaedic meaning and can refer to anything or everything. Everything we want to say about how people attempt to understand their place on this planet may be found in it. Myth is a generator of ideas that in a peculiar way, manages to signify most things to most men. It is a combination of self - fulfilling prophecy and allegory, rationality and fancy, logic and irrationality, and fantasy world and conscious thinking. The definition of the word spans the whole range, from erroneous thought to truthfulness and enlightenment. The French word "myth" (mythe) comes from the Greek word "Mythos," which refers to an expression or occurrence. Even if we may all agree that myth is either something or nothing, we eventually discover that this does not really get to the heart of the matter. This naturally leads us to acknowledge that myth is a recreative process in and of itself, and that additional reinterpretation follows from the fact that myth is contained in language, an unlocked system. The roles of a cultural critic, folklorist, translator, economist, anthropologist, and so forth constantly intersect. Once a myth is expressed through words, it acquires the characteristics of a literary work and becomes independent. It's also evident that myth has evolved from a religious narrative to a made-up magical tale including heroes and even gods and goddesses. Dramatists in India like Girish Karnad employ harikatha and bhagavatha storytelling techniques, as well as a legendary and religious framework for his themes. This can be found in *Hayavadana*, his play. Through the application of a mysterious framework to a peculiar modern style in *Yayati* and *Nagamandala*, he is able to discern the myths' ongoing relevance and its conversion from religious dimension to fictitious level (Ramakrishnan, 1997). Sometimes a fiction writer will employ a theme or character that subtly alludes to a tale, but he or she will also specifically use the patterns inherent in myths. By viewing life as a voyage or mission, modern man's adventure is connected—though not directly—to all the passion narratives of the past. A recurring topic in myth and other narratives is the eternal struggle between right and wrong, along with all the opposing forces, inconsistencies, and crises that surround it. This struggle also clearly includes a religious component as well. The Indian epic *Mahabharata* has several instances of these motifs.

Mahabharata recounts Pandavas' captivity. The issue of expropriation and banishment is explored here in this sacred text. The Christian theme of the voyage to the land of milk and

ISSN 2319-829X 33
Humanities and Social Science Studies, Vol. 12, Issue 2, No. 17, July – December 2023

CONTEXT-SPECIFIC AND PHILOSOPHICAL DIMENSIONS OF LITERATURE

Dr. Fr. Joby Joseph Assistant Professor, Department of English, Kuriakose Elias College, Affiliated to M. G. University, Kottayam, Kerala 686561

Abstract

The primary way a writer expresses his individuality is through his literary work. Great genius—another word for the uniqueness and freshness of disposition the source of a great work. The author becomes close to life, takes an in-depth look at life, and asks the readers to share his experience. According to a statement made by Plato, the cornerstone of all meaningful and enduring literary works is the idea of authenticity. The determining factor of a writer's genuineness is not what he has borrowed from other writers but rather what he has personally experienced. Literature has been defined in several ways. For example, it may be classified as fiction written in a creative but non-technically precise manner. Shakespeare, Webster, Marvell, and Milton are all regarded as representatives of seventeenth-century English literature, yet even a cursory look at what is frequently defined as literature shows that this is impractical. This pertains to all. The artistic writings of Sir Thomas Browne, Francis Bacon, John Donne, and John Bunyan, as well as everything else, are all forms of literary expression in one way or the other. The paper seeks to highlight how literature may be classified in terms of creative impulses and self-expression, which includes argumentation, meditation, and literary and aesthetic aspects. The reader engages with the author's ideas and experiences and comes into contact with his magnetic and powerful personality.

Keywords: Literature, Self-expression, Views, Formalism, Criticism, Truth.

Distinction between Fact and Fiction

It doesn't seem like separating fact from fiction would lead us very far, not least because the distinction between the two is frequently contested. For instance, it has been suggested that the conflict between factual and artistic reality in our own society had nothing to do with the early Icelandic storylines. In the late sixteenth and early seventeenth centuries, when the word novel appears to have been used to apply to both real and imagined events, even news items were unlikely to be considered as authentic. Books and news bulletins were neither obviously real nor obviously fictional, thus our own clear distinctions between these categories did not apply to either. There is little uncertainty that Gibbon and may be the writers of Genesis wrote their works with the intention of capturing the historical truth, yet today, some people see them as reality and others as fabrication. Although many readers now regard Newman's theological thoughts as literary, he surely thought them to be accurate at the time.

Literature also leaves out a lot of fantasy if it has a lot of factual text. Despite the fact that both the Mills & Boon novels and the Superman comic are fictional works, none is regarded as literature. If literature is seen as creative or imaginative work, does this imply that history, philosophy, and natural science are not? This significant issue is brought up by Terry Eagleton in his article, "What is Literature?" In a bit, literature may even be perceived to include Clarendon's History of the Rebellion or Hobbes' Leviathan and the maxims of La Rochefoucauld. In addition to Corneille and Racine, French literature from the seventeenth century includes Bossuet's funeral diatribes, Boileau's thesis on poetry, Madame de Sevigne's letters to her daughter, Descartes and Pascal's philosophy. The notion is that one or two novels by an author are not enough to satisfy one's appetite for literature. If the investigator is sincere, he must do a thorough analysis of the author's whole body of work in chronological sequence. He gains insight into the evolution of the author's ideas and ideals as well as his artisanship through a chronological examination.

Ordinary and Extraordinary Language and Aesthetic Pleasure

Perhaps in the context of unusual language, a completely different approach is required. May be the way that literature is defined has less to do with whether it is fictitious or creative and more to do with the unusual ways in which language is used. On this theory, literature is a kind of writing which, in the

COMMUNICATIONS IN STATISTICS—THEORY AND METHODS
https://doi.org/10.1080/03610926.2023.2235448

Taylor & Francis
Taylor & Francis Group

Check for updates

Dynamic cumulative residual entropy generating function and its properties

S. Smitha[a], Kattumannil Sudheesh K.[b], and E. P. Sreedevi[c]

[a]K E College Mannanam, Kerala, India; [b]Indian Statistical Institute, Chennai, India; [c]Cochin University of Sceince and Technology, Kochi, India

ABSTRACT

In this work, we study the properties of the cumulative residual entropy generating function (CREGF). We also discuss the non parametric estimation of CREGF. We introduce dynamic cumulative residual entropy generating function (DCREGF). It is shown that the DCREGF determines the distribution uniquely. We study some characterization results using the relationship between DCREGF, hazard rate, and mean residual life function. A new class of life distributions based on decreasing DCREGF is introduced. Finally, we develop a test for decreasing DCREGF and study its performance.

ARTICLE HISTORY
Received 11 January 2023
Accepted 06 July 2023

KEYWORDS
Entropy; entropy generating function; U-statistics.

1. Introduction

Entropy is an important concept in the field of information theory and Shannon (1948) was the first who formally introduced it. To measure the uncertainty contained in a random variable X, entropy is defined as

$$H(X) = -\int_0^\infty f(x)\log f(x)dx = E(-\log f(X)), \tag{1}$$

where "log" denotes the natural logarithm. Several measures of entropy have been introduced in the literature, each one suitable for some specific situations. Cumulative residual entropy (CRE) is given by Rao et al. (2004)

$$\mathcal{CRE}(X) = -\int_0^\infty \bar{F}(x)\log\bar{F}(x)dx, \tag{2}$$

where $\bar{F}(x) = 1 - F(x)$ is the survival function of X. Di Crescenzo and Longobardi (2009) introduced cumulative entropy (CE) for estimating the uncertainty in the past lifetime of a system as

$$\mathcal{CE}(X) = -\int_0^\infty F(x)\log F(x)dx.$$

The weighted versions of $\mathcal{CRE}(X)$ and $\mathcal{CE}(X)$ have been studied in the literature as well. These are given by Mirali, Baratpour, and Fakoor (2017)

$$\mathcal{CRE}^w(X) = -\int_0^\infty x\bar{F}(x)\log\bar{F}(x)dx$$

CONTACT Sudheesh K Kattumannil skkattu@isichennai.res.in Indian Statistical Institute, Chennai, India.

ScienceDirect

Materials Chemistry and Physics
Volume 296, 15 February 2023, 127255

The evolution and recent research trends of Surface Enhanced Raman Scattering sensors using plasmonics: Citation network analysis

Ranjini Radhakrishnan [a], Manoj Parameswaran [b], K. Satheesh Kumar [c]

[a] Department of Physics, Kuriakose Elias College, Mannanam, Kottayam, Kerala, 686561, India
[b] Department of Chemistry, St. Michael's College, Cherthala, Alappuzha, Kerala, 688539, India
[c] Department of Futures Studies, University of Kerala, Karyavattom, Kerala, 695581, India

Received 4 March 2021, Revised 8 January 2022, Accepted 20 December 2022, Available online 21 December 2022, Version of Record 5 January 2023.

What do these dates mean?

Check for updates

https://doi.org/10.1016/j.matchemphys.2022.127255

Get rights and content

Journal of Financial Services Marketing (2023) 28:807–821
https://doi.org/10.1057/s41264-022-00174-9

ORIGINAL ARTICLE

Why do people continue using mobile wallets? An empirical analysis amid COVID-19 pandemic

Ajimon George[1] · Prajod Sunny[2]

Received: 27 April 2022 / Revised: 22 June 2022 / Accepted: 20 July 2022 / Published online: 6 August 2022

Abstract
This paper aims to formulate and test a comprehensive model by integrating the strengths of the TAM and IS success model and the addition of two constructs, namely promotional offers and situational influence, to explain the continued usage intention of mobile wallets. Using an online survey, data were gathered from 588 mobile wallet users who had prior experience using mobile wallets for more than six months. The data were examined using the partial least square-structural equation modelling to investigate relationships between variables and test the hypothesised model. The proposed model disclosed 62.6% of the variance in continued usage intention. The situational influence of COVID-19 emerged as the strongest predictor, followed by satisfaction. This study offers valuable insights to service providers and policymakers involved in executing and deploying mobile wallet services. For academicians, this research presents a comprehensive framework that investigates the continued usage of mobile wallets.

Keywords Mobile wallets · Continuance intention · COVID-19 · Technology acceptance model (TAM) · Information systems success model

Introduction

Mobile wallets have become increasingly popular every year since their inception in India. The availability of smartphones at a bargain price coupled with low-cost Internet data plans paved the way for the mobile wallet revolution. India recorded more than 25 billion real-time remittances in 2020, the largest globally, beating even China (Chadha 2021). Further, unified payments interface (UPI) helped accelerate the adoption rate of mobile wallets, processing 38 billion transactions totalling 226 billion USD during the calendar year 2021 alone (Panda 2022). However, COVID-19 fuelled it to greater heights as social distancing became the norm and buyers and vendors favoured contactless payments.

✉ Ajimon George
ajimon.george@mariancollege.org

Prajod Sunny
prajodsunny@kecollege.ac.in

[1] Research and PG Department of Commerce, Marian College Kuttikkanam (Autonomous), Peermade 685531, India

[2] Department of Commerce, Kuriakose Elias College Mannanam, Kottayam, India

Over time, the way people pay for goods and services has changed, and specific industries would not even exist if not for online payment solutions, particularly mobile wallets. A cashless society is safer from robberies as the retailers have less cash to keep on their premises, while the customer has the advantage of various ways to pay (Most Preferred Payment Methods in India 2022). Integrating mobile wallets into the payment infrastructure of e-commerce and online marketplaces enabled seamless and swift transactions (Monteiro 2021). These businesses offer a plethora of additional services through mobile wallets, such as loyalty schemes, discount coupons, and cash backs. Such promotional offers contribute to repeated shopping in online marketplaces and more customer engagement in mobile wallets (Pomford 2022).

Further, the Reserve Bank of India (RBI) has issued a framework to allow transactions of negligible value in offline mode, which will augment the number of transactions (Mundhra 2022) and mitigate the burden on a bank's system resources. The digital payments firm, Pine Labs, observed that the RBI had created robust structures and security controls to empower customers to use electronic remittance systems with trust (Faridi 2022). Secure online payments have become a critical issue, and safeguarding customers

Energy Reports 8 (2022) 12979–12986

Contents lists available at ScienceDirect

Energy Reports

journal homepage: www.elsevier.com/locate/egyr

Research paper

An inverted architecture P3HT:CdSe bulk-heterojunction hybrid solar cell utilizing a quantum junction with high open circuit voltage and efficiency

Ajith Thomas [a,b], Anju Elsa Tom [a,d], V.V. Ison [a,c,*]

[a] Centre for Nano-Bio-Polymer Science and Technology, Research and PG Department of Physics, St. Thomas College, Palai, Kerala 686574, India
[b] Research and Development Centre, Bharathiar University, Coimbatore, Tamil Nadu 641046, India
[c] Research and PG Department of Physics, Kuriakose Elias College, Mannanam, Kerala 686561, India
[d] Department of Physics, St. Aloysius College, Elthuruth, Thrissur, Kerala, 680611, India

ARTICLE INFO

Article history:
Received 17 April 2022
Received in revised form 4 September 2022
Accepted 28 September 2022
Available online 13 October 2022

Keywords:
Bulk-heterojunction
Hybrid solar cell
P3HT
CdSe quantum dot

ABSTRACT

Exploring CdSe QDs as a substitute for [6,6]-phenyl-C61 butyric acid methyl ester (PCBM) in Poly (3-hexylthiophene) (P3HT) based photovoltaic devices received much attention due to its properties such as tunable band gap over the visible range, better band alignment with P3HT and inexpensiveness. But, the V_{OC} values of the P3HT:CdSe QDs bulk-heterojunction (BHJ) hybrid solar cells are still inferior, which happens to be the main performance-limiting factor for these devices. We have resolved this issue in this study by the application of an interfacial buffer layer (BL) in an inverted architecture utilizing zinc oxide (ZnO) as an electron transporting layer. The BL was also formed of CdSe QDs. It was found that the application of the interfacial BL reduces the interface recombination which resulted in a V_{OC} value of 0.96 V. To the best of our knowledge, this is the best V_{OC} value reported for the P3HT:CdSe QDs BHJ system so far. A quantum junction (QJ) was also formed between the QDs in the BL and the QDs in the BHJ by passivating them with Iodine and 3-Mercaptopropionic acid (MPA), respectively. The QJ induces an extended electric field in the BHJ which benefits charge extraction and ultimately resulting in an enhanced short circuit current (J_{SC}).

1. Introduction

Polymer-based photovoltaic devices present great promise due to properties such as high optical absorption coefficient of polymers, easy processing, flexibility, lightweight, lower processing cost and recyclability (Chen et al., 2009; Li et al., 2012; Lu et al., 2015). Among polymer solar cells, bulk-heterojunction (BHJ) polymer solar cells (PSCs) utilizing the donor polymer poly(3-hexylthiophene) (P3HT) and the fullerene derivative electron acceptor, [6, 6]-phenyl-C61 butyric acid methyl ester (PCBM), is the most studied device configuration (Berger and Kim, 2018; Cheng et al., 2018). Though a reference device for many fundamental and conceptual studies of the PSCs today, its performance is only limited to values below 4% (Berger and Kim, 2018). Studies show that majority of the performance- limiting factors of these devices are centered on the acceptor material PCBM. The wide band gap of PCBM (~2.4 eV) limits the light absorption to a short range of the solar spectrum (Dennler et al., 2009; Shen et al., 2012). Also, the large offset of the lowest unoccupied molecular orbital (LUMO) of PCBM to that of P3HT spoils the opportunity to get a high V_{OC}, which could have been achieved using the wide band gap materials P3HT and PCBM (Dang et al., 2011). In addition to these electronic demerits, PCBM has several disadvantages like high air and humidity sensitivity and large cost, making device fabrication tedious and expensive (Perthué et al., 2018; Reese et al., 2010). These factors in fact urge a quest for an acceptor material having qualities like ambient stability, cost-effectiveness, lower band gap for better absorption in the visible region and a suitable alignment to the LUMO of P3HT.

Inorganic semiconducting nanocrystals (NCs) or quantum dots (QDs) are found to be a suitable substitute in P3HT based solar cells as a replacement option for PCBM or as a secondary acceptor due to their properties such as tunable band gap, high dielectric constant, high charge mobility and appreciable light absorption over a broad range (Greaney and Brutchey, 2015; Wright and Uddin, 2012). Alivisatos et al. first reported such a polymer–nanocrystal hybrid solar cell (HSC) utilizing CdSe

* Corresponding author at: Centre for Nano-Bio-Polymer Science and Technology, Research and PG Department of Physics, St. Thomas College, Palai, Kerala 686574, India.
E-mail address: isonv@rediffmail.com (V.V. Ison).

https://doi.org/10.1016/j.egyr.2022.09.190

ISSN 0304-9892 (Print) ISSN 2455-7463 (Online)
www.vijnanaparishadofindia.org/jnanabha
***Jñānābha*, Vol. 52(2) (2022), 272-279**
(Dedicated to Professor D. S. Hooda on His 80th Birth Anniversary Celebrations)

FUZZY OPTIMIZATION AND *gH*- SYMMETRICALLY DERIVATIVE OF FUZZY FUNCTIONS

Edithstine Rani Mathew[1] and Lovelymol Sebastian[2]
[1]Department of mathematics, K. E. College, Mannanam-686561,Kerala, India
[2]Department of Mathematics, M.E.S College,Nedumkandam-685553, Kerala, India
Email: edithstine@gmail.com,lovelymath95@gmail.com

(Received: October 07, 2020*; In format: October* 13, 2021*; Revised: November* 27, 2022*; Accepted: November* 29, 2022*)*

DOI: https://doi.org/10.58250/jnanabha.2022.52232

Abstract

In this paper, we introduce a new concept called Algebra of generalized Hukuhara symmetrically (*gHs*) differentiable fuzzy function. We specifically state the prerequisites for the *gHs* differentiability of the product and composition of a differentiable real function and a *gHs* differentiable fuzzy function, as well as the *gHs* differentiability of the sum of two *gHs* differentiable fuzzy functions.

2020 Mathematical Sciences Classification: 90C70
Keywords and Phrases: Fuzzy optimization,gH derivative.

1. Introduction

In optimization, there are two components namely, objective functions and constraints. Practically objective functions rarely holds real number as coefficients. Most of the time, they have uncertainty. These values may not be accurate also. The disadvantages of uncertainty or inaccuracy can be tackled by the use of fuzzy programming approach.
Works of Rommelfanger [10] and Delgado et al. [6] viewed this from 90s onwards. Lodwick [9] gives a detailed literature review on this topic. Paper of Slowinski and Teghem [11] compares optimization problems with multiple objectives. Inuiguchi [8] has done a similar comparison but for problems to solve portfolio selection.
Generalization of hukuhara differentiability(*HD*) of set valued functions will give *HD* of fuzzy valued functions where the differentiability is based upon Hukuhara difference. Hukuhara [7] developed the subtraction of two sets. Hukuhara derivatives introduced in [7] is widely used by researchers in the field of set and fuzzy valued functions due to its importance in fuzzy differential equations as well as optimization problems.

It is found from the works of [1], [2],[3] and [5], compared to *H* differentiable functions *gH* differentiable fuzzy functions are relatively general. H.C.Wu [13] studied the *KKT* optimality conditions for fuzzy function and also for multiobjective fuzzy function.[14]
Here we propose a new idea known as generalized Hukuhara symmetrically(*gHs*) differentiable fuzzy functions. We can see that *gHs* derivative of fuzzy functions is more general than *gH* derivative.
Section 2 contains preliminaries. we define our main definition, *gHs* differentiable fuzzy function and some theorems related to it in section 3. Section 4 deals with fuzzy optimization of *gHs* differentiable functions. In last section, we obtain the optimality conditions of non-dominated solution applying *gHs* derivative to fuzzy optimization.

2. Preliminaries

Assume $\mathcal{I}_C$ represents the family of all intervals belongs to $\mathbb{R}$ which are bounded .
ie $\mathcal{I}_C$=$\{[\underline{k}, \overline{k}] | \underline{k}, \overline{k} \in \mathbb{R}$ and $\underline{k} <= \overline{k}\}$.
Suppose $A = [\underline{a}, \overline{a}]$ and $B = [\underline{b}, \overline{b}]$ denote the two fuzzy intervals. Now we explain the HausdorffPompeiu distance(H_p) from A to B as

$$H_p(A, B) = max\{|\underline{a} - \underline{b}|, |\overline{a} - \overline{b}|\}. \tag{2.1}$$

Clearly $(\mathcal{I}_C, H_p)$ denotes a complete metric space .
Let $\mathbb{R}^n$ denotes a mapping $l : \mathbb{R}^n \to [0,1]$. We represent the α level set, $[l]^\alpha = \{t \in \mathbb{R}^n | l(t) >= \alpha\}$ for any $\alpha \in (0,1]$.
Now we recall the definition of support as: $supp(l) = \{t \in \mathbb{R}^n | l(t) > 0\}$.

Definition 2.1. *Suppose l denotes fuzzy set on* $\mathbb{R}$*and l becomes a fuzzy interval only when the following conditions are hold:*

1. *l is normal and upper semi continuous,*

Vol. LXV, Issue-1, No. 12, 2022 पुराणम् - Purana

QUEST FOR PERFECTION AND COMPLETE IDENTITY IN JOSÉ SARAMAGO'S NOVELS: A RE-READING OF *BLINDNESS*

Joby Joseph
Assistant Professor, Department of English, Kuriakose Elias College, Mannanam, Affiliated to M.G. University, Kottayam, Kerala

Abstract:
The novel *Blindness* by José Saramago might enough to show why he was given the 1998 Nobel Prize in Literature. In the novel, Saramago explores the public health nightmare of a society dealing with an outbreak of contagious blindness. An ophthalmologist who loses his vision before finishing the textbook and having a chance to find a treatment for the illness is the story's main character. Throughout the narrative, he serves as a source of comfort and hope for his blind companions. He speaks as a voice of reason in a world that is slowly being flipped upside down as the blindness spreads like wildfire throughout the city. Despite being powerless to stop the blindness, he assumes the roles of a natural leader, the pillar of strength, the barometer of sanity, and a doctor in the truest meaning of the word. In order to maintain the status quo of the blind convicts' mental sanity and cognitive skills, the ophthalmologist's wife also plays an important role in this novel. However, by claiming that he has a fantastic authority on his side, the doctor's allies are able to inspire a great degree of confidence in him. The plot of the novel moves in the direction of achieving complete identity and perfection, while the other characters in it work hard to achieve perfect identity in the truest sense. The Portuguese author José Saramago has made a career out of mocking the pretences of humanity and western politics through several of his writings. The aim of the paper is to investigate the sociological characteristics that are strongly ingrained in that society with reference to gender equality and the pursuit of the ideal identity.

Keywords: Blindness, Identity, Perfection, Spirituality, Self-responsibility, Human dignity

Introduction

The flaws in humanity and democracy are exposed in Saramago's works, which include *Ensaio Sobre a Lucidez* (Essay on Lucidity), *Ensaio Sobre a Cegueira* (An Essay on Blindness), *A Caverna* (The Cavern), and *Todos os Nomes* (All the Names). These works also serve as warnings against the threats to democracy's survival. José Saramago, who was awarded the Nobel Prize for his book *Blindness*, persistently investigates a simple but unnerving concept: What if people were suddenly and irrevocably become blind, one by one, as a result of an infectious force? If the popular metaphor of the glance, with its connection to information, power, and surveillance, were to become unstable, would the civil body's "eyes" survive? Saramago has consistently criticised the free-market ideology in recent press interviews because he thinks his fiction both represents and combats the dehumanization; he holds that ideology responsible for. As a novelist and a public figure, it is clear that Saramago sees corporate globalisation as a cloaked type of dictatorship where people are treated like a disposable resource.

ISSN : 0555-7860
UGC-CARE Group 1 Journal

Indian Journal of Psychological Science Vol-17, No. Special Issue (September-2022) ISSN-0976 9218

A GENDER-BASED STUDY TO MEASURE MINDFULNESS AND LOCUS OF CONTROL AMONG SEX WORKERS

[1] Ms. Jikku Mariam John, [2] Ms. Chinchu Rani Vincent

Abstract

A sex work is regarded as one of the oldest professions in the world. However, sex work is not driven by biological satisfaction, but is rather driven by the financial and psychological distresses which influenced large population to the entry of sex work profession. The review of literatures shows that problem of sex workers in India is so widespread. The need of measuring the positive psychological aspects of sex workers is also an important action. The present study is a descriptive study research design using questionnaire was employed to examine the relation between mindfulness and locus of control among male and female sex workers. It will help to know more about their positive psychological functioning of sex workers. The sampling technique used in the present study was cluster sampling. The number of samples taken among male sex workers and female sex workers was 50 each from Kottayam district. The data was collected between the age group 35 and 55 years old. The tools used for the study are Levenson Multidimensional Locus of Control Scales and Mindful Attention Awareness Scale. The data was analyzed using the SPSS package in which t- test and Pearson correlation test was used. Findings suggest that there is a low positive correlation between mindfulness and chance scale, a dimension of locus of control at 0.01 level. There is not much gender difference has been found for locus of control and mindfulness among male and sex workers.

Keywords: *sex workers, locus of control, mindfulness, positive aspects, gender*

About authors: *[1] Assistant Professor, [2] Assistant Professor*
Kristu Jyoti College of Management and Technology, Kottayam, Kerala
Kuriakose Elias College, Kottayam, Kerala

INTRODUCTION:

Sex work is taken into account one of the few long-standing professions in history as well as the most stressful and dangerous occupation (Rekert, 2005). It's defined as the practice or business of exchanging money or goods for sexual services, either regularly or occasionally, involving female, male, and transgender adults (UNAIDS, 2005). Sex work is assumed to possess a negative effect on self-esteem, nearly exclusively expressed as low self-worth, its social unacceptability and despite the range of persons, positions and roles within the sex industry. Few researchers have examined the way during which the stressful characteristics of sex work impact their well-being (Ross et al., 2012). Vanwesenbeeck (2005) documented several sex-work stressors, including lack of support from co-workers and gatekeepers, lack of job autonomy, lack of reward from work, and work-related stigma, which they all exerted detrimental effects on sex worker's psychological functioning. Within the global literature, scholars have identified many potential stressors within the context of commercial sex, including heavy workload, encounters with enforcement officials, substance abuse, abusive clients, exposure to violence, HIV/STD infections, exploitation, discrimination, and stigmatization (Ross, 2011). A far better understanding of psychological stressors within the context of economic sex is, therefore, important.

A sex work is considered the world's oldest profession, which isn't driven by need of physical satisfaction only, but is quite driven by the economic and psychological distresses which contribute largely to the entry of sex worker during this profession. The review of literatures shows that problem of sex workers in India is so widespread. Sex workers are considered to be a backward community. Due to the stigma of the society, they are considered as inferior. The literature of reviews in sex workers focused on measuring psychological stressors. Measuring the positive psychological aspects of sex workers is also an important action. People with personal locus of control had more life satisfaction, job satisfaction, positive emotions, less negative emotions and also psychological well-being measures. Rather than reflexively reacting to environmental challenges, being mindful enables one to cater to life's demands by recontextualizing and reframing automatic fear-based feelings and reactions.

Mindfulness is one of the key factors that can lead them to a satisfying life, considering the fact that it is important to outlook about the factors that control them. Many studies show that mindfulness-based therapy increased internal locus of control. Therefore, the

Indian Journal of Psychological Science Vol-17, No. Special Issue (September-2022) ISSN-0976 9218

DIFFERENT PSYCHOLOGICAL CONSTRUCTS ON PET OWNERS DURING COVID-19 PANDEMIC.

[1] Anu Mary James, [2] Karthika Elizabeth

Abstract

The concept of positive mental health and the factors that contribute to the same plays a significant role during a pandemic situation, and the goal of this research was to find out the connection between psychological variables happiness, empathy and resilience in pet owners and Non-owners and to study the effect of owning a pet, on these parameters of a person during the COVID 19 pandemic. An online survey was performed for this purpose in which both pet owners and non-owners participated across multiple countries and different age groups, relationship statuses and socio-economic backgrounds. Happiness was measured using the satisfaction with life scale (SWLS), the interpersonal reactivity index (IRI) gave the values of empathy and the brief resilience scale (BRS) was used to calculate the resilience of the participants. The study also looked into the relationship between happiness, empathy and resilience of an individual and this was computed by checking the correlation between these parameters. The difference in the three parameters dog owners vs. non-dog owners were studied using the Mann-Whitney U test. Another area of investigation was a breakdown of the type of pets owned and to see if different pets had different degree of happiness, empathy and resilience in their owners and this was also calculated using the Mann-Whitney U test. Finally, the study also looked into the effect of the pet-owner's relationship status, using the Mann Whitney U test to identify any significant variations in happiness, empathy and resilience between single pet owners and couple/married owners. It was found that there was significant relationship between happiness, empathy and resilience of an individual it was also seen that these parameters did not significantly vary in dog owners and non-owners of pets and there was no a substantial distinction in happiness and empathy in single owners and couple owners but it was found that couple/married owners were more resilient compared to single Owners.

Keywords: *Happiness, empathy, resilience, pet-owners, covid-19*

About authors: *[1] MA Psychology student, [2] Asst. Professor in contract*
Indira Gandhi National Open University (IGNOU),RC Cochin.
Department of Psychology K.E College Mannanam, Kerala.

INTRODUCTION:

The relationship between human beings and animals has existed ever since both species existed on the planet. Human animal interactions were widely studied at different points of time. Animals have been serving human beings and helping them meet some of their basic needs like food, for labor, as a companion, and recently there are even Animal Assisted Therapies (AAT) existing in medical science today. There is evidence of a long-term relationship and persistent emotional connection between human beings and animals, it all started with domestication of animals for human services and there was evidence which proved that dogs were considered companions almost 12000 years ago like a Paleolithic tomb found in Northern Israel had a human Skeleton buried with a dog or wolf puppy; another was while exploring the Chauvet Cave that's in Vallon Pont-d'Arc, southern France a small child's footprints were discovered alongside that of something similar to that of a wolf's.

Since the outbreak of the pandemic COVID 19 there is a sharp increase in the purchase and adoption of pet animals, According to reports of The American Pet Products Association it was reported that in the US about 11.38 million households got a new pet and according to the Pet Food Manufacturers' Association, in the UK about 3.2 million households have purchased or got a pet since the outbreak of the pandemic. The sales of pet food in India was showing a growth of 20 percent in 2020 which can be associated with the increased pet purchase during the COVID-19 imposed lockdown.Pet food Manufacturers Mars Petcare, owning brands like Pedigree, Temptations, IAMS, Whiskas and Nestle's Purina experienced a doubled growth last year. Therefore making the study even more relevant on the question of why there is an increase in the number of pet buys and pet owners and to study what are the impacts of the same on the people and to study the various factors contributing to the same.

Earlier studies on human and pet animal interactions have shown that there is a positive effect on the physical wellbeing of the pet owners compared to non-owners' population. A pet is not just an animal, but it is also a companion and also provides pleasure in its companionship. The COVID 19 pandemic hit the world in 2019 and ever since then people were restricted to move around and leave their home and even the frequent lockdown made them spend a lot of time at

Current Analytical Chemistry, 2022, *18*, 288-308

REVIEW ARTICLE

Nanophotocatalysis for the Removal of Pharmaceutical Residues from Water Bodies: State of Art and Recent Trends

Mekha Susan Rajan[1], Anju John[1] and Jesty Thomas[1,*]

[1]*Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala 686561, India*

Abstract: ***Background:*** The occurrence of pharmaceuticals in surface and drinking water is ubiquitous and is a major concern of researchers. These compounds cause a destructive impact on aquatic and terrestrial life forms, and the removal of these compounds from the environment is a challenging issue. Existent conventional wastewater treatment processes are generally inefficacious because of their low degradation efficiency and inadequate techniques associated with the disposal of adsorbed pollutants during comparatively effective methods like the adsorption process.

Remediation Method: Semiconductor-mediated photocatalysis is an attractive technology for the efficient removal of pharmaceutical compounds. Among various semiconductors, TiO_2 and ZnO-based photocatalysts gained much interest during the last years because of their efficiency in decomposing and mineralizing the lethal organic pollutants with the utilization of UV-visible light. Incessant efforts are being undertaken for tuning the physicochemical, optical, and electronic properties of these photocatalysts to strengthen their overall photocatalytic performance with good recycling efficiency.

Results: This review attempts to showcase the recent progress in the rational design and fabrication of nanosized TiO_2 and ZnO photocatalysts for the removal of pollutants derived from the pharmaceutical industry and hospital wastes.

***Conclusion*:** Photocatalysis involving TiO_2 and ZnO provides a positive impact on pollution management and could be successfully applied to remove pharmaceuticals from wastewater streams. Structure modifications, the introduction of heteroatoms, and the integration of polymers with these nano photocatalysts offer leapfrogging opportunities for broader applications in the field of photocatalysis.

ARTICLE HISTORY

Received: July 08, 2020
Revised: October 16, 2020
Accepted: January 02, 2021

DOI:
10.2174/1573411017666210412095354

Keywords: Photocatalysis, TiO_2, ZnO, solar light, pharmaceuticals, wastewater.

1. INTRODUCTION

The extensive presence of pharmaceutically active compounds (PhACs) in aquatic ecosystems has become an emergent concern over the last years due to their adverse effect on aquatic and terrestrial organisms [1, 2]. Even though the practice of antibiotics consumption is advantageous for maintaining human health, their undesirable discharge in various environmental compartments induces a secondary effect because of their endocrine-disrupting properties [3-5]. Literature reports the presence of thousands of different ingredients for the production of pharmaceuticals, comprising antibiotics, painkillers, impotence drugs, contraceptives, antidiabetics, lipid regulators, antidepressants, and beta-blockers [6]. These PhACs enter aquatic environments through innumerable sources, including untreated effluents discharged from pharmaceutical industries, hospitals, and private households. Furthermore, the agriculture industry uses livestock's manure as a fertilizer which implies a chance for pharmaceutical residues to infiltrate into groundwater [7-10]. These pharmaceuticals or drugs which are developed to be biologically active and persistent to sustain their medicinal activity promote antimicrobial resistance (AMR) in bacteria when it enters aquatic systems [11, 12]. Thus the growth of antibiotic-resistant pathogens and ecotoxicity due to the incessant expulsion of PhACs into the environment has raised significant concern regarding its potential risk to human's health and aquatic organisms [13]. AMR happens when the micro-organisms acquire the ability to withstand those medicines that would normally destroy them or inhibit their growth. If we do not tackle this scenario of expanding drug-resistant pathogens, it is estimated that by the year 2050, 10 million lives per year are at threat owing to the growth of antibiotic-resistant infections [14].

*Address correspondence to this author at the Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala 686561, India; Tel: 9447779496; Fax: +91-481-2732278;
E-mail: jestyk@kecollege.ac.in

1875-6727/22 $65.00+.00

Photochemical & Photobiological Sciences (2022) 21:509–528
https://doi.org/10.1007/s43630-022-00179-2

ORIGINAL PAPERS

Kaolin-graphene carboxyl incorporated TiO_2 as efficient visible light active photocatalyst for the degradation of cefuroxime sodium

Mekha Susan Rajan[1] · Minjoong Yoon[2] · Jesty Thomas[1]

Received: 2 September 2021 / Accepted: 28 January 2022 / Published online: 1 March 2022

Abstract

A novel solar light active photocatalyst, TiO_2/kaolin-graphene carboxyl nanocomposite was synthesized by hydrothermal method for the degradation of cephalosporin antibiotic, cefuroxime sodium. The synthesized photocatalyst was characterized by various analytical and spectroscopic techniques, including Fourier transform infrared spectroscopy (FT-IR), powder X-ray diffraction (XRD), transmission electron microscopy (TEM), scanning electron microscopy (SEM), energy dispersive X-ray analysis (EDX) thermogravimetry (TG), UV–Vis diffuse reflectance spectroscopy (DRS) and photoluminescence (PL). The prepared TiO_2/kaolin-graphene carboxyl nanocomposite exhibited efficient photocatalytic degradation of methylene blue (MB) upon illumination with the solar simulator as compared to unmodified TiO_2. The incorporation of both kaolin and graphene carboxyl was found to immobilize TiO_2, enhancing the visible light absorption range of TiO_2. Scavenger study revealed that hydroxyl radicals act as the main active species in the photocatalytic degradation process. The hydroxyl group present on kaolin surface reacts with photo-generated holes to increase the amount of hydroxyl radical, and further the graphene carboxyl plays a role to impede the recombination of photo-generated electron–hole pairs. Furthermore, the synthesized photocatalyst was found to degrade cefuroxime sodium within 90 min of sunlight illumination, indicating that TiO_2/kaolin-graphene carboxyl nanocomposites would be very beneficial for pharmaceutical waste management through the advanced oxidation process. Mass spectral analysis was also carried out for elucidating the photocatalytic degradation pathway of cefuroxime sodium.

✉ Jesty Thomas
jestyk@kecollege.ac.in

[1] Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala 686561, India

[2] Department of Chemistry, Chungnam National University, Daejeon 34134, Republic of Korea

INTERNATIONAL JOURNAL OF ENVIRONMENTAL ANALYTICAL CHEMISTRY
https://doi.org/10.1080/03067319.2022.2036736

Taylor & Francis
Taylor & Francis Group

Check for updates

Enhancement of photocatalytic activity of g-C_3N_4 under solar light by Nd^{3+} doping and HPA incorporation and its application in the degradation of ceftriaxone sodium

Anju John and Jesty Thomas

Research Department of Chemistry, Kuriakose Elias College, Kottayam, India

ABSTRACT

Nd^{3+}-doped graphitic carbon nitride nanosheets incorporated with heteropoly phosphotungstic acid (Nd^{3+}-g-C_3N_4-HPA) were synthesised, and their optical response, band structure and charge separation efficiency were analysed. UV–vis diffuse reflectance spectral studies revealed that Nd^{3+} doping and HPA incorporation led to an increase in absorption intensity, which enhances the range of visible light absorption. Improved separation efficiency and reduction in the recombination rate of photogenerated electrons and holes are supported by photoluminescence studies. This novel photocatalyst was applied for the removal of the antibiotic, ceftriaxone sodium from water and attained complete degradation within 75 min of sunlight irradiation, demonstrating that the Nd^{3+}-g-C_3N_4-HPA photocatalyst would be beneficial for eliminating persistent organic pollutants like dyes and pharmaceutical compounds from wastewater. Investigations revealed that superoxide anion radicals and holes play a significant role in the photocatalytic degradation of pollutants. Furthermore, a possible degradation pathway of ceftriaxone sodium was proposed using mass spectral analysis.

ARTICLE HISTORY
Received 20 September 2021
Accepted 22 December 2021

KEYWORDS
Solar photocatalyst; graphitic carbon nitride; Nd^{3+}-g-C_3N_4-HPA; ceftriaxone sodium degradation

1. Introduction

Antibiotics have been extensively used for both human treatment and animal husbandry over the past few decades. The excessive use of antibiotics resulted in incipient organic contaminants with fetotoxic and mutagenic properties [1–5]. Ceftriaxone sodium, an antimicrobial drug with broad-spectrum bactericidal capability [6], has been widely used for treating respiratory tract infection (RTI), urinary tract infection and gonorrhoea. However, its excessive intake causes toxic effects such as abdominal pain, a decrease in the prothrombin time, renal dysfunction and allergic dermatitis [7]. Due to the irrational use and inadequate treatment, a large amount of ceftriaxone sodium antibiotics has been released into the environment. Hence, its presence in the aquatic and earthbound environment is increasing in an alarming rate, causing potential threat to the aquatic ecosystems, microbial population and health of human being. Many researchers are focusing on the effective

CONTACT Jesty Thomas jestyk@kecollege.ac.in
Supplemental data for this article can be accessed here

Implications of Intercultural Communicative Competence in English Language Teaching/Learning in the 21st Century

Dr Sujarani Mathew

ABSTRACT

English language has come a long way from being the coloniser's tongue to an international language. It is now considered the means of intercultural communication between the native speakers of English and the second (or even)/ foreign language learners of the medium. So the new concept of ICC (Intercultural Communicative Competence) in ELT classrooms has assumed significance in the globalised era. Language and culture are two sides of a coin, learning a foreign language also includes learning the target culture. This is imperative to communicate with people of various countries in real-time situations which is highly possible in the existing scenario of the global village, in the 21st century. At present ICC is applauded as the perspective in ELT which moulds the learner to become balanced mediators between their own and other cultures with cultural and Communicative Competence in the English language. The article intends to make a comprehensive view of the significance of this concept in the present language classroom and how it is different from the earlier concept of communicative competence which had informed language pedagogy. The different methods used in ELT before the 1950s and the relative merit of the later designer (humanistic) approaches are also detailed. The latest approaches of Communicative Language Teaching (CLT) and Task Based Language Teaching (TBLT) are considered to be best employed in acquiring Intercultural Communicative Competence. The learning methods, materials as well as the scope of such learners as skilled ethnographers are also dealt with in this paper.

Keywords: Intercultural Communicative Competence, Kachru's circles, Globalisation, Target culture/language, CLT/TBLT, Metacultural perception

English, the Global Language, used across the world for science and technology as well as the internet has expanded from being the prime official language of a small group of nations in the West to the lingua franca in the Eastern countries like India and Singapore to China, Germany and others. This is explicated in Kachru's circles(1989), where English expands from the inner circle of countries where English is the primary language; to the outer circle where English is the second language in a multilingual country; to the expanding circle where English is studied as a foreign language. Kachru's cycle which became a potent field of interest pointed at the need to understand the culture associated with this target language for all (second and foreign language) learners of English. This can be done by encouraging interculturalism, where

Moran, P. R. (2001) *Teaching Culture: Perspectives in Practice*. Ontario, Canada, Heinle & Heinle.

Neff, Peter and John Rucynski Jr(2013). Tasks for integrating language and culture teaching. *English Teaching Forum*, v51 (2) :12-23.

https://americanenglish.state.gov/files/ae/resource_files/neff_rucynski_-_forum.pdf

Robinson, G. L. N. (1988) *Cross-cultural Understanding*. Hertfordshire, UK Prentice Hall International

Rogers, T. (2003). Methodology in the New Millenium. *English Teaching Forum, 41*(4), 2-13

Retrieved from https://americanenglish.state.gov/files/ae/resource_files/03-41-4-a.pdf

Stern, H. H. (1983). *Fundamental Concepts of Language Teaching*. Oxford: Oxford University Press.

Tran, T. Q., & Seepho, S. (2015). An instructional design model for intercultural language teaching: a proposed model. *Humanising Language Teaching*, 17(1):73-89. University of Illinois Press.

Willems, G. M. (1996) Foreign language study for intercultural communication. *Multicultural Teaching* 14.3, 36-40.

Dr. Sujarani Mathew, Associate Professor and HOD, Department of English, K.E. College, Mannanam, Kottayam, Kerala, India

"To contract or not to contract.. that's the question".

It is said that there are about seventy different types of contractions in the English language. One of the features differentiating speech from writing is the use of contractions; a distinctive feature of the speech of the native speaker. In the ESL and EFL classes learners are asked to contract their speech because the use of contractions makes the speech sound near natural. As a norm I have always maintained that the deployment of contractions in writing is a case of bad grammar. It is not that we do not have instances in the history of the English language where contractions were never employed in writing. Shakespeare used them, and so did Charles Dickens, Mark Twain and scores of modern writers and publications that supposedly introduce high quality writing. We avoid contractions in academic writing because of these reasons: (1). Contractions make a serious piece of writing sound weak (2). The flow of reading is disturbed as contractions call for the omitting of the internal letter or letters, and (3). The use of an apostrophe looks quite messy.

In addition to this list there is yet another compelling reason against the use of contractions in scholarly writing: *ambiguity*. Though *ambiguity* is one of the design features of language, it has to be avoided as much as possible as it propels multiple meanings. A contracted expression such as *'she's gone'* has two readings: *'she is gone'* and *'she has gone'*. In *'she is gone'*, the *'is gone'* is taken as adjective and it means that *'she is no more'*. The second reading, *'has gone'* means that *right now she is not there* and *she could come back in future.*

David Crystal is a living legend and an indisputable authority on the English language. His work, **A Little Book of Language** uses contractions extensively. Having read this book, if one asks, *"If Crystal could use contractions in writing, why can't I" ?* I really have no answer except to say, *"go ahead and use them if you want to make your writing totally ambiguous, difficult to read and funny". What do you think?*

K. Venkat Reddy, Professor, The English & Foreign Languages University, Hyderabad – (venkatcielf@gmail.com)

Indian Journal of Natural Sciences www.tnsroindia.org.in ©IJONS

Vol.12 / Issue 70 / February / 2022 *International Bimonthly (Print)* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

HPTLC Fingerprinting of Secondary Metabolites in the Aqueous Extracts of Stem Bark and Leaves of *Ziziphus rugosa* L.

Midhila Baby[1]* and Mathews.T.Thelly[2]

[1]Assistant Professor, Department of Botany, Kuriakose Elias College, Mannanam, Kottayam, Kerala - 686561, India.

[2]Associate Professor and HOD, Department of Botany, K.E. College, Mannanam, Kottayam, Kerala - 686561, India.

Received: 14 Nov 2021 Revised: 21 Dec 2021 Accepted: 11 Jan 2022

***Address for Correspondence**
Midhila Baby
Assistant Professor,
Department of Botany,
Kuriakose Elias College,
Mannanam, Kottayam,
Kerala - 686561, India.
Email: midhilababy5@gmail.com

ABSTRACT

Many of the current medications that are in use today for various ailments are based on plants and plant-based products. HPTLC (High-Performance Thin Layer Chromatography) is a useful technique for determining the analytical quality of herbal items and various novel products from natural sources. This study aims to develop HPTLC fingerprint profiles for various secondary metabolites in the aqueous extracts of the stem bark and leaves of the medicinal plant *Ziziphus rugosa* L. To obtain maximum resolution for chromatographic fingerprinting, analysis for each compound is done utilizing mobile phase and derivatization reagent particular to that metabolite. The present study is carried out using a CAMAG HPTLC system equipped with Linomat V applicator, TLC scanner 4, TLC visualizer 2 and Reprostar 3 with 12bit CCD camera for photo documentation, controlled by winCATS- 4 software. The fingerprinting of aqueous extract of the plant revealed 8 alkaloids (stem bark-4, leaf-4), 9 steroids (stem bark-3, leaf-6), 8 flavonoids (stem bark-2, leaf-6), 2 glycosides (leaf-2), 5 saponins (stem bark-2, leaf-3), 3 tannins (stem bark-1, leaf-2), and 10 terpenoids (stem bark-1,leaf-9).

Keywords: Aqueous extract, *Ziziphus rugosa* L., HPTLC profile, Alkaloids, Steroids, Flavonoids, Glycosides, Saponins, Tannins, Terpenoids.

37888

PSYCHOLOGY AND EDUCATION (2021) 58(2): 5744-5747 ISSN: 00333077

Education and Cultural Capital as Criteria of Social Mobility: A Socio-Psychological Study in Victorian Literature

Dr Sujarani Mathew
Assistant Professor of English KE College Mannanam Kottayam,Kerala
katrinsuja@gmail.com

ABSTRACT

The motif of transition in social class and structures of hierarchy through human relations are central to most of Jane Austen's fiction. Ranging from the universal favourite and 'lightest' of Austen's fiction, Pride and Prejudice and the 'lengthiest ' of her oeuvre Mansfield Park, this theme is conspicuous in the depiction of 18th century 'genteel' England of Austen's pen. While the former traces the fortunes of two sisters of the upper middle class gaining foothold among the rich upper class, the latter is a solemn narrative of the protagonist of lower class shuttling between the luxury of Mansfield Park and the squalor of Portsmouth. It is the 'cultural capital' that their social and personal background confer them that accord them the change in social status and power.

Education, as well as the innate good principles of the protagonist in both the novels ensures the happy conclusion and the upward social mobility therein which forms the plot of both the novels. This paper will be an attempt to analyse the two novels in the light of the theory of 'cultural capital' developed by Pierre Bourdieu which explicates the lived experience of class and cultural positions warranted by the social hierarchies in question.

The concepts of 'habitus' and 'field' also feature as corollary to the fictional context of Austen's novels since her characters constantly climb and at times regress from the class structures to which they belong. This study seeks to analyse the fortunes of the central characters in the novel Mansfield Park which begins with the three Ward sisters marrying to upper, middle and lower classes of society and the novel Pride and Prejudice that ends with the Bennet sisters' shift from the lawns of Longbourne to the 'shades of Pemberley'.

Keywords
Cultural Capital, Economic Class, Habitus, Social Hierarchy, Field

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

Introduction

The early 19th century England enshrined in the classic works of the pre Victorian writer Jane Austen depicts minutely the social structure of genteel England. Her two inches of ivory that carves out the life and aspirations of the middle/ upper classes of England also dovetails the expectations and intrigues in the female heart in order to achieve eligible social status and matrimonial prizes in the form of desirable suitors. The everyday life and humdrum of existence with its social life and hardships of the period is beautifully depicted in her novels--Pride and Prejudice and Mansfield Park. The theme of social mobility that is often cited in Austen's novels can be seen in the conclusion of the novels where Elizabeth Bennet and Fanny Price rise unmistakably up the social ladder through the institution of marriage. The two novels taken up for study are Pride and Prejudice -the lightest and most popular of Austen's novels and her lengthiest and most moralistic work-Mansfield Park. Jane Austen comments on Pride and Prejudice was that (2008 a) "it is so light…it needs shade". In her 1813 letter to her sister Cassandra about her next novel Mansfield Park she speaks of a (as cited in Ivanis) "complete change of subject and [that] it will be about ordination."

But the two novels depict protagonists of opposite nature with Elizabeth Bennet as a witty, intelligent and active lady and Fanny Price as a passive, unimaginative and quiet heroine. Yet, Jane Austen depicts both as women of meritorious character and discerning temperament. Their superior reason and principles finally earn the love and respect of gentleman of quality and they are ensconced in good marriages based on true love. Jane Austen's Regency period is one in which class structure and hierarchy was more or less rigid and social mobility was extremely limited. Women being of secondary status in 19th century, could aspire to rise from their social circumstances only through marriage. The class hierarchy was closely monitored by those that belong to the upperclass and encroachment was strongly monitored. Yet Jane Austen's outlook seems to be that real merit in character deserve to be rewarded through progression in social status as seen in the case of the heroines in the novels (one from middle class and the other of lower class)under study.

Marriage is a relationship which could cause change in social status but it is not one in which corporeal goods are transacted in exchange like commodities. Here the form of subjectivity that collude to the material, corporeal and symbolic attributes are significant as in Husserl's concept of 'lifeworld'. My intention is to analyse the change in fortunes of the characters in the two novels in the light of the French sociologist Pierre Bourdieu's concept of 'Cultural Capital'.

Similar to Marx, Bourdieu too agree that capital is the basis of social life and accorded one position in society commensurate to it. Bourdieu extended Marx's idea of capital beyond the economic and into the more symbolic realm of culture. Bourdieu's (1986) concept of cultural capital refers to the collection of symbolic elements such as skills, taste, posture, clothing, mannerism, material belongings, credentials etc that one acquired through being part of a particular group(246). This form of cultural capital according to Bordieu also could be a source of social inequality. Bourdieu categorised cultural capital into three forms—embodied, objectified and institutionalized. In the

Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 4812-4817
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.05.534

POSITION OF MEMES IN TROLLS: A LINGUISTIC ANALYSIS OF INTERNET TROLLS IN THE CONTEXT OF SCRIPT BASED SEMANTIC THEORY OF HUMOUR

ASWATHY MAHESWARAN, Research Scholar, Department of English, St. Thomas College, Palai
DR. SUJARANI MATHEW, Assistant Professor, Department of English, K E College, Mannanam

Abstract- Internet trolls are the most innovative yet hilarious side of the virtual world where tech savvies tryout their creativity. Society has reached the point where there exists no boundaries between humanworld and virtual reality. This lack of distinction between the two worlds has enabled technology to intrude even in the language of homo sapiens. In addition to the oral and written form of language they have invented a new sign system to communicate in a morerelaxed manner likethe lingos of internet,emojis,stickers and memes. Though it has been invented for entertainment purpose, the acceptance of internet trolls even in the official sectors inspires man to exert much energy in creating, sharing and understanding memes. Since Internet trolls have grown large enough to deal with serious matters like politics and other social discourses, they reduce the space for alphabets and that space has been accorded to memes. But the presence of meme enabled trolls to present their ideas in more precise, effective and also in a hilarious way. This paper is an attempt to analyse the structure and nature of internet trolls in the context of humour. Using the Script Based Semantic theory, put forwarded by VictorRaskin, the nature and functions of words and memes in a troll text and different types of communication it contributesis analysed and studied.

SSTH is perhaps one of the few theories to analyze the linguistic behaviour of humour texts. By delineating the various criteria put forwarded by the linguist for a humour text, each element in the internet troll can be identified,compared and contrasted with otherones in the same text. This paper also gives a short introduction to the origin and growth of the 'meme' and how it expressesits linguistic natureas different from the status of a single short image,within a troll text, is also manifested here.

Key words: **Memes, Internet trolls, SSTH, script, text, script oppositions, overlapping, semantic triggers, ambiguity, contradictory trigger.**

I. INTRODUCTION

The alpha generation being confused with the boundary of virtual and real-world mishmash their language, community of real friends (with those in virtual world), and reality with imagination. The phenomenon called internet trolls has become part and parcel of their life and memes become the meaningful unit of their language. Internet trolls were born as verbal abuse and sarcastic comments, but realizing its potential the virtual world started adding more components to increase the effect of the action called trolling. Memes are one of these components in trolls.Though the word *meme* is borrowed from Richard Dawkin's book *The Selfsh Gene* it was Mike Godwin who put forwarded the idea of 'internet meme' in 1993. From the short video clips that appeared in You Tube, meme continued its journey as GIFs in Twitter, Facebook and later as precise static images. Being one of the indispensible components of internet trolls, memes have acquired the status of a significant element in virtual language.

A meme carries bits of cultural information along with its entertaining and communication capability. Similar to a word in a language, memes communicate ideas and emotions. Memes are becoming a constant part of communication through sharing. "In this new era, the two meanings of the term in the pre digital age-sharing as distribution and sharing as communication-converge" (Shifman 19). Hence the people who participate in the virtual world communication finds a meme as something that can have a good life span, productivity and at the same time, is mimetic too.

A meme is precise like a word that can be learned and reproduced and convey meaning as letters do in a language. A meme has a perfect locus in the structure of trolls. It is indeed like a slang in a language. Only those who understand the connotative meaning can enjoy the entire partof the troll.

A meme becomes viral when a group of people share and enjoy it as they have the same cultural consciousness. People have the basic knowledge about the trolls existing in social media and the way it to

ScienceDirect

Photodiagnosis and Photodynamic Therapy

Volume 36, December 2021, 102479

Development of photoresponsive zinc oxide nanoparticle - encapsulated lignin functionalized with 2-[(E)-(2-hydroxy naphthalen-1-yl) diazenyl] benzoic acid: A promising photoactive agent for antimicrobial photodynamic therapy

Linta Maria Jose [a b] ✉, Sunny Kuriakose [a] ✉, Tessymol Mathew [c] ✉

[a] Research and Post Graduate Department of Chemistry, St. Thomas College, Palai – 686574, Mahatma Gandhi University, Kottayam, Kerala, India

[b] Research and Post Graduate Department of Chemistry, Kuriakose Elias College, Mannanam – 686561, Mahatma Gandhi University, Kottayam, Kerala, India

[c] Research and Post Graduate Department of Chemistry, St. Georges College, Aruvithura-686122, Mahatma Gandhi University, Kottayam, Kerala, India

Received 2 June 2021, Revised 29 July 2021, Accepted 5 August 2021, Available online 8 August 2021, Version of Record 17 August 2021.

What do these dates mean?

Check for updates

https://doi.org/10.1016/j.pdpdt.2021.102479

Get rights and content

Kala Sarovar **ISSN: 0975-4520**
(UGC Care Group-I Journal) **Vol-24 No. 04 October-December 2021**

TRAUMA AMONG WOMEN IN WAR TORN NIGERIA

Mereena Eappen[1], Dr. Sujarani Mathew[2]
[1]Research Scholar, English Department, St. Thomas College, Pala, Kerala.
[2] Research Supervisor & Head of English Department, K.E. College, Mannanam, Kerala.

ABSTRACT
Wars and conflicts are persistent subjects that pretense rigid collective trauma to the occupants in Africa. Psychological impacts among women in African countries are endless. Taking Nigeria as a post-colonial/war affected country, there are diverse traumatic events experienced by the native women both domestically and socially. The World Health Organization stated that such violent psychological trauma may trigger acute/chronic post-traumatic stress disorder (PTSD), depression, anxiety and therefore, theoreticians put to light its numerous belongings particularly on women along with their lives in national violence, steady disasters, loss of a beloved, rape, polygamy, female genital mutilation or being a witness of civil wars/ national conflicts. Thus, a composed psychological health for the Nigerian women is thwarted by the occurrence of stress caused from war and they rarely express those vicissitudes of life events. This article focuses the traumatic effects of war on women, a vacuum to be addressed and therefore, I attempt to emphasis the cost of the skirmishes on Nigerian women, their inputs in the national conflicts, and their impacts to the survival of families, people and the country.

KEYWORDS: Mental health, Women, War, Psychology, Trauma, PTSD.

INTRODUCTION

Traumatic events are sustained psychological experiences that tend to suggestively damages a person's daily purposes and is acknowledged by symptomatic patterns that are confined in the International Classification of Diseases (9 ICD-2010) and the Diagnostic and Statistical Manual of Mental Health 5th edition (DSM-V-TR). The non-western cultures have recognized various symptoms of traumatic experiences that were not included in DSM-V and ICD. Nigerian women are not exceptional to the epidemic experience of traumatic events. It is a very difficult or unpleasant experience that causes someone to have mental or emotional problems usually for a long time like them. Women in a masculine society like Nigeria are preserved with gender subservience which subjects them to experience enduring trauma.

CONCEPTUALIZATION OF TRAUMA

Trauma as a notion is a derived concept from Greek word that stands for 'wound'. However, in the late 19th century Pierre Janet and Sigmund Freud offered the first approach to the conceptualization of trauma theory. Both of them intellectualized psychological trauma. While Freud's formulation of psychological trauma met with extraordinary level of disapproval, the modern conceptualization of trauma but owe their origin to Freud's theory. For the medical experts, trauma is associated with events of life that are somatic and deadly due to accidents or physical injuries incessant due to accidents. This is a therapeutic outlook which has been assumed in USA and government views trauma as "an injury that results from exposure to either a mechanical force or another extrinsic agent, including an extrinsic agent that is thermal, electrical, chemical, or radioactive" (Trauma Care Act 2014). But, behavioral scientists observed trauma from a dissimilar perspective and intellectualized it as psychological practice. For them, trauma is the outcome of negative psychological experience "from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being" (Substance Abuse and Mental Health Services Administration 67). There are two inferences to be predictable on the behaviorist's perspective of trauma. Formerly, those traumatic events impose shock, horror, sense of weakness, severe or threats of physical/psychological injury or death on the individuals who has a first-hand involvement of the occurrence. Secondly, the influence of traumatic events develops as they indirectly victimize traumatic events and being a rescue worker, friends/relatives of the first hand victims. In expressing psychological trauma, many scholars enlightened that psychological trauma is an emotional injury more severe and immediate than it does a physical tear. In a broader context, Diagnostic and Statistical Manual of Mental Disorders clearly defined trauma as the "exposure

© 2021 JETIR September 2021, Volume 8, Issue 9 www.jetir.org (ISSN-2349-5162)

JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

ROLE OF SPIRITUAL INTELLIGENCE ON RESILENCE AND MENTAL HEALTH

*Jacquiline Thankachan, &** Ms. Mitha babu.

* Consultant Psychologist, **Assistant professor, Psychology department, KE college, Mannanam, Kerala, India.

Abstract

Background: Previous studies stated that Spiritual Intelligence is a factor that helps an individual in personal development, life satisfaction and to find meaning and purpose in life which helps to deal with various conflicting ideas in day-to-day life.

Objectives: This study was carried out to investigate the mediating role of spiritual intelligence with resilience and mental health among young adults.

Methodology: A purposive sample of 100 young adults between 18 – 35 was identified. The sample consists of 50 males and 50 females. An attempt was made to collect socio-demographic variables including age, gender, and location of the samples. Spiritual Intelligence Self Report Inventory (SISRI), Brief Resilience Scale (BRS), and Mental Health Continuum Short Form were administered. The statistical technique used for analyzing data was a correlation method.

Results: The results indicate that spiritual intelligence has a positive correlation with resilience and mental health among young adults.

Conclusions: Young adults in the modern world face a lot of stressors that can induce a negative effect on their resilience and mental health. Developing Spiritual intelligence through various methods like Meditation (observing your thoughts), Yoga (shifting your awareness from mind to body and notice what your body tells you about your emotional and mental state) can help people to cope with everyday stressors.

Keywords: Spiritual Intelligence, Resilience, Mental Health.

I. Introduction

Stress can be defined as any event or situation in the environment that contributes to or causes a disruptive experience; that event or situation is called a stressor. The lifestyle of the person can influence stress experiences. Spiritual intelligence combines spirituality and intelligence structures within a new structure (Emmons, 2006). The concepts that have been evoked the global interest of psychologists. Spiritual intelligence makes use of multiple ways to recognize, understand and deal with various stressors effectively. Spiritual intelligence can be enhanced in anyone irrespective of gender, race, and age.

1.1 Spiritual Intelligence

The concept of spirituality and the spiritual evolution of man has been studied by mental health professionals in the past few decades. Spiritual intelligence is a term used by some philosophers, psychologists, and developmental theorists to indicate spiritual parallels with IQ (Intelligence Quotient) and EQ (Emotional Quotient). Stivenz (1966) introduced the concept of spiritual intelligence and then Emmons (2000) developed it. Danah Zohar coined the term "spiritual intelligence" and introduced the idea in her book - Rewiring the Corporate Brain in 1997. World Health Organization considers the spiritual aspects as some existential aspects of the human beings, considering it as a dimension, namely the spiritual aspect in human growth and development after physical, mental, and social dimensions (World Health Organization, 2005). Studies of various psychologists like Zohar & Marshall, 2000; Vaughan, 2002; Young & Koopsen,

International Journal of Cardiology Hypertension 8 (2021) 100077

Contents lists available at ScienceDirect

International Journal of Cardiology Hypertension

journal homepage: www.journals.elsevier.com/international-journal-of-cardiology-hypertension/

Research Paper

The relationship of lipid peroxidation and antioxidant status to selected modifiable risk factors in coronary artery disease patients

Anoop Vijayan [a], V. Chithra [b], C. Sandhya [c,*]

[a] Research Department of Microbiology, Sree Sankara College, Kalady, Ernakulam, Kerala, 683574, India
[b] Department of Biochemistry, N.S.S College, Pandalam, Pathanamthitta, Kerala, 689501, India
[c] Department of Biochemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala, 686561, India

ARTICLE INFO

Keywords:
Coronary artery disease
Lipid peroxidation
Risk factors for coronary artery disease

ABSTRACT

Background: Coronary artery disease (CAD) is found to be associated with a wide range of modifiable and non-modifiable risk factors.
Aim of the Study: To evaluate the relationship of lipid peroxidation and antioxidant status to selected modifiable risk factors in angiographically proven CAD patients.
Methods: 150 angiographically proven CAD patients were categorized into three, based on selected risk factors. Data was collected using proforma and from hospital records. Peroxidation and antioxidant levels in blood samples were assessed using standard procedures.
Results: In category, I, significantly higher level of lipid peroxidation and the lower enzymatic antioxidant level were observed in patients with diabetes, hypertension, and with both diabetes and hypertension, when compared with patients without these clinical characteristics ($p < 0.01$). Similar results obtained for patients following a non-vegetarian diet when compared with patients following a vegetarian diet (category II). In BMI based group (category III), patients with BMI>25kg/m2 showed a significant increase in peroxidation and low enzymatic and non-enzymatic antioxidant levels than those with normal BMI.
Conclusion: The study confirmed a strong association between selected modifiable risk factors, higher lipid peroxidation, and lower antioxidant levels in angiographically proven CAD patients. This provides leads in the management of cardiovascular events in CAD patients.

1. Introduction

Coronary artery disease (CAD) is the most prevalent disease with the highest global mortality rate. According to the World Health Organization, CAD accounted for 17.6 million deaths per year in 2016 and maybe expected to rise to 23.6 million by 2030 [1]. Lipid peroxidation is a free-radical mechanism that plays a significant role in cardiac dysfunction pathogenesis [2]. A healthy antioxidant status is therefore critical for human health, in particular, to reduce peroxides and prevent chronic diseases such as CAD.

Different environmental and genetic factors concurrently implicated in CAD [3]. Age, sex, race and family background are the non-modifiable risk factors for CAD whereas the modifiable factors include increased blood pressure, cholesterol levels, triglyceride levels, diabetes, alcohol intake, smoking, eating patterns, obesity, etc. [4]. Several studies on associating risk factors with CAD are available. Researchers have shown a consistent link of hypertension to coronary artery disease [5]. Diabetes mellitus (DM) was also reported to play a major role in the propensity to CAD [6]. Obesity is increasingly recognized as an epidemic and a modifiable risk factor for CAD [7]. Collecting evidence from a host of clinical trials and observational studies, researchers concluded that individual adopting a plant-based diet display 16–32% reduction in cardiovascular disease mortality risk.

Researchers suggested that the effects of risk factors on CAD may differ across ethnic groups [8,9]. The high prevalence of CAD in India may be due to increased genetic risks and predominance of cardiovascular risk factors. Among all Indian states, Kerala has the highest prevalence of coronary artery disease, 7.4% in rural areas and 11% in urban areas [10]. Our previous studies showed that CAD intensity is closely linked to increased lipid peroxidation and decreased antioxidant status when compared to normal healthy subjects [11,12]. Hence, the aim of this study was to examine the relationship of lipid peroxidation and

* Corresponding author.
E-mail addresses: anoopanoop001@yahoo.co.in (A. Vijayan), chitra.vasanthakumari@gmail.com (V. Chithra), sandhya@kecollege.ac.in (C. Sandhya).

https://doi.org/10.1016/j.ijchy.2021.100077
Received 6 September 2020; Received in revised form 24 December 2020; Accepted 30 December 2020
Available online 5 January 2021

Article

Developing a Research Model for Mobile Wallet Adoption and Usage

IIM Kozhikode Society & Management Review
10(1) 82–98, 2021

DOI: 10.1177/2277975220965354
journals.sagepub.com/home/ksm
SAGE

Ajimon George[1] and **Prajod Sunny**[2]

Abstract

The scope of the mobile wallet in a 'Cashless India', whose utility has been spurred by the exponentially growing smartphone technology, is a contemporary topic of deliberation. The reach of mobile wallets gets broader each day with the entry of new stakeholders into the scenario, making mobile wallets indispensible for meeting daily needs. Given the COVID-19 pandemic situation, increased reliance on mobile wallets, and its acceptability among the public and other associated e-services, researchers and service providers are eager to explore its adoption as well as its continued usage. This paper theoretically examines factors influencing behavioural intention and actual usage of mobile wallets through various technology adoption models and behavioural studies. Based on an extensive review of the literature, this paper attempts to draw a comprehensive conceptualization of mobile wallet adoption and actual use by exploring the influence of various key factors. This proposed model could successfully present the case of mobile wallet adoption and usage, as well as offer the possibility of deriving important managerial implications concerning effective marketing techniques.

Keywords

Compatibility, perceived reputation, trust, promotional offers, perceived critical mass, behavioural intention, COVID-19

Introduction

Going digital is a phenomenon no sector can afford to ignore. Irrespective of the industry one is operating in—whether large or small scale, traditional or e-commerce, consumer interfacing or industrial—every sector is bound to get affected by the digital wave that would sooner or later transform the landscape of the economy. Mobile phones have affected the lives of billions of people around the globe and have transformed telephony tremendously. The number of mobile phones in use surpasses every other technical device that can be used to market, sell, produce, or deliver products and services to consumers. This has opened lucrative opportunities to both merchants and service providers (Iman, 2018). The increasing number of smartphone owners worldwide has paved the way for traditional banking payment services, and non-financial companies, like Google, to attract new customers and open up new markets by extending their range of products and services, particularly those concerning offering innovative payment alternatives (Meyll & Walter, 2018).

Digital financial services have brought financial services from bank branches into our homes and pockets. During this transformation, financial transactions have become more convenient and have reached a broader group of users (Reiss, 2018). Technological innovations in mobile devices and financial applications drive the adoption of digital payments (Goparaju, 2017). Customers who use their smartphones for mobile payments can store information of credit or debit cards in mobile wallets on their smartphones, and this information can be used to perform payments by tapping or waving it over a sensor at the point of sale or at the comfort of their homes.

The mobile wallet is a new application of mobile payment that functions as a replacement for the conventional wallet and more (Sumathy & KP, 2017). Mobile wallets add more functions to smartphones by making it a virtual debit card and enables a person's money to move with his phone. With mobile wallets, retailers gain another way to access consumers and enhance sales by enabling customers to make spontaneous purchases because they have quick and easy access to money. Some of the most widely used mobile

[1] Associate Professor & Research Guide Marian College Kuttikkanam (Autonomous), Kerala, India.
[2] Assistant Professor, Kuriakose Elias College, Mannanam, Kerala, India.

Corresponding author:
Ajimon George, Associate Professor & Research Guide Marian College Kuttikkanam (Autonomous), 685531, Kerala, India.
E-mails: ajimon.george@mariancollege.org; prajodsunny@gmail.com

Environmental Science and Pollution Research (2021) 28:24992–25013
https://doi.org/10.1007/s11356-021-13528-y

REVIEW ARTICLE

Carbon nitride-based photocatalysts for the mitigation of water pollution engendered by pharmaceutical compounds

Anju John[1] · Mekha Susan Rajan[1] · Jesty Thomas[1]

Received: 23 November 2020 / Accepted: 15 March 2021 / Published online: 27 March 2021

Abstract
In recent decades, the destructive impact of active pharmaceutical ingredients (API) present in surface and drinking water on aquatic and terrestrial life forms becomes a major concern of researchers. API like diclofenac (DCF), carbamazepine (CBZ), tetracycline (TC), and sulfamethoxazole (SME) found in water bodies cause antimicrobial resistance and are potent carcinogens and endocrine disruptors. Conventional wastewater treatment methods possess some drawbacks and were found to be insufficient for the effective removal of APIs. Visible light-assisted semiconductor photocatalysis has become an alternative choice for tackling this worse scenario. Graphitic carbon nitride, a metal-free visible light active semiconductor photocatalyst is an emerging hotspot nanomaterial whose practical utility in water purification is widely recognized. This review comes up with an insightful outlook on the panorama of recent progress in the field of g-C_3N_4-assisted photocatalytic systems for the eradication of APIs. In addition, the review summarizes various strategies adopted for the broad-spectrum utilization of visible light and the enhancement of charge separation of pristine g-C_3N_4. The mechanistic pathways followed by different pharmaceuticals during their photocatalytic degradation process were also briefly discussed.

Keywords Photocatalysis · g-C_3N_4 photocatalyst · Pollutant degradation · Pharmaceuticals · Solar light · Waste water treatment

Introduction

Active pharmaceutical ingredients (APIs) are fundamentally assorted class of emerging contaminants (Benotti et al. 2009) and the presence of pharmaceuticals in the environment resulted in the development of antimicrobial resistance (AMR) (UN Environment 2017) which is recognized as one of the biggest global public health concerns by the UN Environment. Advancements in the analytical method sensitivity (Siddiqui et al. 2017), expanded use of various pharmaceuticals, and improper disposal of medications by households, pharmaceutical companies, and hospitals have worsened the scenario. The highly soluble, persistent pharmaceutical compounds present in water bodies can act as potent carcinogens, and even low concentrations of pharmaceuticals in the environment can cause adverse effects on flora and fauna including renal malfunctioning in vultures (Swan et al. 2006), reproduction impairment in fish (Nash et al. 2004), and retardation and inhibition of growth in certain aquatic species (Ebert et al. 2011).

In order to tackle the problem, efficient wastewater treatment techniques should be utilized. Conventional methods involving filtration, adsorption, reverse osmosis (RO), activated sludge, etc. (Patel et al. 2019) are found inadequate for the efficient and complete removal of APIs from wastewater. Among various water treatment technologies, advanced oxidation processes (AOPs) (Kanakaraju et al. 2018) are promising choices for wastewater treatment as they can adequately debase watery contaminations, while essential ordinary procedures and actuated carbon-based adsorption process are just associated with the physical change of toxins without any degradation. Numerous AOPs, for example, UV/H_2O_2, photo-fenton, sonolysis, electrochemical oxidation, ozonation, and photocatalysis, are utilized for the effective degradation of organic pollutants, and the in situ generation of highly reactive oxygen species (ROS) such as hydroxyl radicals ($^{\bullet}OH$) and superoxide anion radicals ($^{\bullet}O_2^-$) in AOPs enables complete mineralization of pollutants into CO_2, H_2O, and inorganic ions or acids (Dalrymple et al. 2007). However, photocatalysis is recognized as ideal green, cost-effective, and sustainable technology (Xu et al. 2019a) for addressing worldwide ecological pollution and energy shortages.

Responsible editor: Sami Rtimi

✉ Jesty Thomas
jestyk@kecollege.ac.in

[1] Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala 686561, India

Indian Journal of Advances in Chemical Science

Article

Degradation of Endocrine Disruptors using Modified TiO_2 Nanorods under Sunlight

Radhika.S, Jesty Thomas*

Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala, India

ABSTRACT

Anatase phase TiO_2 nanorods modified with perylene nanoparticles (PeNPs) (PNR_{520}) showing excellent photocatalytic activity under sunlight were synthesized. Titanium isopropoxide [$C_{12}H_{28}O_4Ti$] and aqueous KOH solution were hydrothermally treated to form hydrogen titanate and were calcined at 520°C to get TiO_2 nanorods. PeNPs were prepared from perylene-3,4,9,10-tetracarboxylic dianhydride using D-glucosamine hydrochloride. Phase transition from hydrogen titanate to pure anatase phase TiO_2 was confirmed by X-ray diffraction analysis. high resolution transmission electron microscopic analysis shows that the anatase phase TiO_2 consists of nanorods. Photocatalytic activities of the samples were assessed by studying the photocatalytic degradation of rhodamine B. Study reveals that TiO_2 nanorods modified with PeNPs could completely degrade common endocrine disruptors such as 4-chlorophenol, resorcinol, and salicylic acid under sunlight and are more efficient than the commercial photocatalyst Degussa P25.

Key words: Anatase TiO2, Perylene nanoparticles, Pollutant degradation, Solar photocatalyst.

1. INTRODUCTION

Significant attention has been gained by researches focusing on the remediation of endocrine disrupting compounds as they have an adverse impact on living organisms and environment [1]. Endocrine disrupting chemicals are exogenous agents which interfere with the synthesis, secretion, transport, binding, and elimination of natural hormones in the body that is responsible for the maintenance of homeostasis, reproduction, development, and behavior [2]. They mimic the actions of natural hormones present in living organisms, causing genetic disorders such as tumors and infertility. Phenolic compounds such as chlorophenols, resorcinol (R), and phenolic acids belong to the category of endocrine disruptors. 4-chlorophenol (4-CP), R, and salicylic acid (SA) are usually found in the wastewaters of paper, pharmaceutical, and dyestuff industries [3,4]. Phenolic compounds discharged from these sources may result in the widespread contamination of the aquatic ecosystem due to their hazardous and carcinogenic properties. Hence, they are considered as persistent, bioaccumulative, and toxic (PBT) chemicals by the US Environmental Protection Agency. Remediation of PBT chemicals is a serious issue as they are very difficult to degrade using conventional treatment methods.

Semiconductor photocatalysis is a novel green technology for the complete mineralization of PBT chemicals. TiO_2 is an extensively used photocatalysts for this purpose because of its properties such as non-toxicity, inertness (chemically and biologically), and photocatalytic stability [5]. It is widely regarded that ultra-fine catalyst powders with high surface area and crystallinity are desirable to enhance the photocatalytic activity [6]. Recycling and maintaining high activity of photocatalysts are critical issues toward long-term photocatalytic applications. In practical photocatalytic process, separation of these fine powder photocatalysts from solution after the reaction is very difficult; also the tendency to agglomerate into larger particles reduces the photocatalytic efficiency during reuse [7]. One (1D) dimensional systems, such as nanowires and nanorods, are the small dimension structures which can be used for the efficient transport of charge carriers and optical excitations. They can be easily recovered from reaction mixture than nanopowders [8,9]. Among different kinds of TiO_2 nanostructures, nanorods/tube based materials are promising in various fields such as dye sensitive solar cells [10], photocatalysts [11], and medical field [12] ascribed to the characteristic features of these 1D nanostructures. In this study, we have synthesized anatase phase TiO_2 nanorods for photocatalysis, through simple hydrothermal route, followed by calcination without using any templates.

Anatase TiO_2 having a large band gap of 3.2 eV, limits its applications utilizing the visible region, which consists of 45% of solar spectrum. Significant efforts have been devoted to enhancing the efficiency of TiO_2 under visible light using various methods such as metal/non-metal doping [1,3], formation of hetero structures with organic dyes, and photosensitive molecules [13]. Sensitization of wide band gap semiconductors using photosensitive molecules is an efficient method for expanding the absorption to visible region to exploit solar light for photocatalysis. The photosensitive molecules act as an antenna which captures the energy of sunlight and initiates the ultrafast electron injection from the singlet excited state of the photosensitive molecule into the conduction band (CB) of the semiconductor in femtoseconds [14].

Organic dye nanoparticles such as perylene nanoparticles (PeNPs) exhibit distinctive optoelectronic properties superior to their bulk

***Corresponding author:**
E-mail: jestyk@kecollege.ac.in

ISSN NO: 2320-0898 (p); 2320-0928 (e)
DOI: 10.22607/IJACS.2020.804003

Received: 08th August 2020
Revised: 23rd August 2020
Accepted: 28th November 2020

Transcendentalism and East West Intertexts: A Cross-sectional Analysis of Indian and Western Literary Criticism

Sujarani Mathew

Abstract

Roland Barthes' dictum, "every text is an intertext" reflects the range and wavelength engendered by each literary work. The exchange of outlook, philosophy as well as worldviews, becomes the end product of this phenomenon of crosscultural exchange. Indian philosophy and literary criticism, based on ancient Sanskrit knowledge, has undoubtedly influenced the Western literary circles throughout history. This paper is an attempt to make a cross-sectional analysis of the wide range of influence that ancient Indian philosophy as well as Barata's *Natyasatra* has exerted on modern western literature and criticism. It focusses on Transcendentalism and the influence of the Eastern thought on Emerson, the Romantic poets and the modern writers. It also attempts a comparison of Barata's concept of *Rasa* with Aristotle's *Catharsis* and Longinus' *Sublime* and traces its relation to the modern concept of 'affects'. The significance of Bakhtin's theory of dialogism is also examined for an understanding of the interaction of multiple voices involved in East-West influence in the domains of thought, culture and literary aesthetics.

Keywords: intertexuality, transcendentalism, dialogism, navarasa, affects

The theory of intertexuality has come a long way from Bakhtin's concept of dialogism and Kristeva coining the term in the 1960s. Roland Barthes' dictum 'every text is an intertext' brings on a poststructural relevance to the concept as interconnectedness and influence give way to discursivity and dismantling of the text. But beyond these paradigms, the vortex of cultural nuances and evolution of new cultural practices that new and revolutionary intertexts provide also need to be examined. The historical metamorphosis through invasion and assimilation between nations from B.C. era to the present, the

Sujarani Mathew: Assistant Professor of English, Kuriakose Elias College Mannanam, Kottayam, Kerala. She has published a collection of short stories, *Teen Vibes*, besides research articles in reputed journals.

Sujarani Mathew

Lacanian Narcissism in Text: A French Feminist Overview of Kamala Das's Oeuvre

Abstract

The South Indian writer Kamala Das's poetry is an ample site for Lacanian discourse of the 'other' in the mirror. Lacan with his concept of the 'mirror image' develops the concept of the formation of human language. The significant interrelationship between the human psyche and the language it employs also brings to fore the implications of French feminism in understanding women writing. Kamala Das's poetry, particularly her collection *The Old Playhouse and Other Poems* is studied here in order to understand this Indian writer from a French feminist point of view. The indisputable influence of Lacan in French theoretical enterprise forms the basis of this article. Das's incessant search for ideal love or the 'other' is traced out here. This article delineates the play(house) of the woman's body and the mirror she finds in society as well as language.

Keywords: Lacanian Other, Lack, L'ecriture Feminine, Mirror Image, Narcisissm, Patriarchy, Semiotic Discourse.

Jacques Lacan in his essay, "The Insistence of the Letter in the Unconscious," states that "the unconscious is structured like a language"(81). The dynamics of psychology instituted within a literary work thus give rise to a whole new branch of criticism called psychoanalytic criticism based on the works of luminaries like Freud, Lacan, Jung and Frye. But the studies of the woman question and her sexuality took issue with the Freudian theories that allotted to the female a secondary status and psychological inferiority. The theories of Jacques Lacan have on the other hand influenced feminist thought to a large measure and French Feminism which came up after the 80s came into an international frame upon the footsteps of Jacques Lacan.

Dr Sujarani Mathew is Assistant Professor and Head in the Dept of English, K.E College Mannanam, Kottayam, Kerala.

On Interval Valued Fuzzy Graphs Associated with a Finite Group

Ann Mary Philip[1,b], Sunny Joseph Kalayathankal[2,c] and Joseph Varghese Kureethara[3,a]

[1]*Assumption College, Changanacherry, Kerala, India*
[2]*Kuriakose Elias College, Mannanam, Kerala, India*
[3]*CHRIST (Deemed to be University), Bangalore, Karnataka, India*

[a]Corresponding author: frjoseph@christuniversity.in
[b]anmaryphilip@gmail.com
[c]sunnyjoseph2014@yahoo.com

Abstract. We associate a particular type of interval-valued fuzzy graph(IVFG) called interval-valued fuzzy identity graph(IVFIG) with every finite group and study its various properties. We show that IVFIG associated with a finite group is not unique. We also show that every IVFIG associated with a finite group is a strong IVFG. It does not contain any feeble or weak arcs. Further, it is strongly connected. We prove that the IVFIG associated with a finite group in which every element is self inversed is an interval-valued fuzzy tree and the IVFIG of Z_n (n is odd) under addition modulo n is the disjoint union of interval-valued fuzzy cycles.

INTRODUCTION

Fuzzy graphs are introduced in the literature by Kaufmann[6]. The theory of fuzzy graphs are developed by Rosenfeld[13]. An elegant generalization of fuzzy graphs can be seen in interval-valued fuzzy graphs proposed by Hongmei and Lianhua[4]. Ever since fuzzy graphs were introduced, generating fuzzy graphs from other mathematical structures is a creative work done by the researchers. For example, analogical to the idea of fuzzy subgroup, Biswas introduced Interval-Valued Fuzzy Groups [3].

Our plan in this paper is to find parallels between interval-valued fuzzy graphs and algebraic groups. We take a finite group and associate it with an interval-valued fuzzy graph. We also mention about the pivotal role of identity element in the group and the associated interval-valued fuzzy graph. In the discussion that follows from now we use the abbreviation IVFG to denote interval-valued fuzzy graph.

PRELIMINARIES

We use only the common graph theoretic terms. We explain some of them depending on their relevance in the study. Basic ideas related to IVFGs can be obtained from [2] and [7]. In [8], [9] and [12], path-related concepts and connectivity-related concepts are introduced. Unless mentioned otherwise, G and e denote a group and its identity, respectively.

We present the definition of the IVFG with respect to a crisp graph given in [2].

Definition 1. Let $\Gamma^\star = (V, E)$ be a crisp graph. The interval-valued fuzzy graph Γ on $\Gamma^\star$ is a pair $\Gamma = (A, B)$, where $A = [\mu_A^-(x), \mu_A^+(x)]$ is an interval - valued fuzzy set on V and $B = [\mu_B^-(xy), \mu_B^+(xy)]$ is an interval - valued fuzzy set on E satisfying the following conditions:

$$\mu_B^-(xy) \leq \min\{\mu_A^-(x), \mu_A^-(y)\}$$

eTIME-2019 – International Conference on Emerging Trends in Mechanical Engineering
AIP Conf. Proc. 2236, 060005-1–060005-8; https://doi.org/10.1063/5.0006810
Published by AIP Publishing. 978-0-7354-1995-7/$30.00

Journal of Porous Materials
https://doi.org/10.1007/s10934-019-00857-0

Synthesis of hybrid materials by immobilizing para-aminobenzoic acid complexes of Eu^{3+} and Tb^{3+} in zeolite Y and their luminescent properties

K. S. Ambili[1] · Jesty Thomas[1]

Abstract
Two new lanthanide containing zeolite Y based luminescent hybrid materials were synthesized and characterized. Exchange of Na^+ from zeolite Y with lanthanide ions (Eu^{3+} or Tb^{3+}) was carried out by ultrasonication and annealing. Para-amino benzoic acid was introduced to the ion exchanged zeolite Y to form complex with the lanthanide ion. Characterizations of the materials were carried out using IR spectroscopy, PXRD, SEM, UV–Vis absorption spectroscopy, TG–DTA and DSC analysis. Luminescence properties of these materials were studied using photoluminescence spectroscopy. Complex formation inside the zeolite cage increased the luminescence efficiency of the lanthanide ions through antenna effect. Tb^{3+} containing hybrid material showed efficient energy transfer due to the optimal energy level matching of the triplet level of ligand and the emissive level of Tb^{3+}. Zeolite Y structure acts as a protective barrier against the degradation of organic part as is evident from the high thermal stability of the materials.

Keywords Inorganic–organic hybrid material · Zeolite Y · Para-aminobenzoic acid · Luminescence

1 Introduction

Advanced luminescence properties and high colorimetric purity of the emitted light from lanthanide ions demand the design, synthesis and development of novel lanthanide organic complexes. Enhanced luminescence from the lanthanide center can be achieved by preparing lanthanide organic complexes in which the coordinated organic molecule is first excited with light of proper wavelength and effectively transfers its energy to the central lanthanide ion [1, 2]. Recently, the manufacture of inorganic–organic hybrid materials having integrated properties of organic and inorganic parts has been extensively investigated [3–10]. Lanthanide based inorganic–organic hybrid materials can combine the advantages of inorganic part like high thermal and mechanical stability with the benefits of organic part like synthetic versatility, luminescence property etc. Various inorganic matrices such as zeolites, SBA-15, MCM-41, titania, alumina and clay have been combined with organic compounds like aminoalcohols, polyalcohols, polymers, alkoxides, pyridinecarboxylic acids, β-diketones etc. for the development of organic–inorganic hybrids and composites [3–12]. Among various aforementioned materials there has been a great interest for constructing zeolite based host–guest materials. Zeolites are crystalline inorganic materials with pores of molecular dimensions and have extensive application in areas such as catalysis, gas absorption, water filtration etc. Presence of uniform cavities and channels along with its high ion-exchange capability extend their applications from catalysis to luminophor host materials for photoluminescence center [13].

During the last decades zeolite Y entrapped transition metal complexes have been synthesized and used as catalysts over various organic reactions [14–18]. Recently, lanthanides exchanged zeolites, functionalized zeolites and their derivatives are intensively investigated due to their credible photoluminescence based applications in different fields [19, 20]. Encapsulation of luminescent lanthanide organic complexes inside the channels or cavities of zeolites leads to

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s10934-019-00857-0) contains supplementary material, which is available to authorized users.

✉ Jesty Thomas
jestyk@kecollege.ac.in

[1] Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala 686561, India

Published online: 13 January 2020

BioNanoScience (2020) 10:583–596
https://doi.org/10.1007/s12668-020-00748-8

Check for updates

Fabrication, Characterization and In Vitro Antifungal Property Evaluation of Biocompatible Lignin-Stabilized Zinc Oxide Nanoparticles Against Selected Pathogenic Fungal Strains

Linta Maria Jose[1,2] · Sunny Kuriakose[1] · Sabu Thomas[3]

Published online: 12 May 2020

Abstract
The present work aims to develop photoresponsive nanoparticle incorporated biomacromolecular aggregates with excellent optical and antimicrobial properties by the apt combination of zinc oxide nanoparticles with lignin, a macromolecular binding system. The biopolymer lignin-stabilized zinc oxide nanoparticles were fabricated by a cost-effective chemical precipitation route. The synthesized ZONPs and lignin-stabilized ZONPs were characterized by UV-visible, FT-IR and fluorescence spectrophotometric techniques, scanning electron microscopy (SEM), transmission electron microscopy (TEM) and X-ray diffraction (XRD) analyses. The antifungal efficacy evaluation of the developed ZONP encapsulated lignin aggregates was done against selected pathogenic fungal strains. The study established the use of ZONPs encapsulated in water-soluble and biocompatible macro matrix lignin as an effective antifungal agent in order to improve the antimicrobial performance in biomedical and environmental applications.

Keywords Zinc oxide nanoparticles · Chemical precipitation · Lignin · Antifungal agent · Biocompatible

1 Introduction

Metal oxide nanoparticles have recently been emerged as an active field of research and have drawn a lot of attention due to their unusual physical and chemical properties, which largely differ from their bulk properties and are providing a fundamental stepping stone for the development of functional nanomaterials. Among numerous metal oxide nanoparticles, which belong mainly to the engineered type of particles, zinc oxide nanoparticles (ZONPs) have become the focus of intensive research and have been broadly explored due to their wide bandgap (3.4 eV), large exciton binding energy (60 MeV) and tunable photophysical attributes such as the ability to transmit visible light, UV absorption, strong room temperature luminescent properties and moderately high refractive index; all these properties have brought these nanoparticles to the forefront of nanotechnology research [1, 2]. Apart from their unique physicochemical and optoelectronic properties, they exhibit different biological actions, thus finding wide application in various fields like catalysis, chemical sensors, photonics, optoelectronics, microelectronics and biomedical applications such as medical diagnostic imaging, pharmaceutical products, medical treatment protocols and antimicrobial applications [3–5]. Zinc oxide is currently being investigated as an antibacterial and antifungal agent in both microscale and nanoscale formulations [6]. It is a biosafe material that possesses photo-oxidizing and photocatalytic impacts on chemical and biological species [7].

Compared with other metal oxide nanoparticles such as copper oxide (CuO), titanium oxide (TiO_2) and nickel oxide (NiO), zinc oxide nanoparticles have been thoroughly investigated in recent years owing to their biocompatible nature, low toxicity to mammalian cells and comparatively less expensive synthesis routes. Zinc oxide is biologically more

✉ Sunny Kuriakose
skresearchgroup@rediffmail.com

Linta Maria Jose
lintamariajose@gmail.com

Sabu Thomas
sabupolymer@yahoo.com

[1] Research and Post Graduate Department of Chemistry, St. Thomas College, Palai, Kerala 686574, India

[2] Research and Post Graduate Department of Chemistry, Kuriakose Elias College, Mannanam, Kerala 686561, India

[3] School of Chemical Sciences, Mahatma Gandhi University, Priyadarshini Hills, Kottayam, Kerala 686560, India

Tathapi
(UGC Care Journal)

ISSN:2320-0693
Vol-19-Issue-31-June-2020

Role of Responsible Tourism in Economic Development: A Systematic Review of Literature

MS. DIVYA JOSEPH
Assistant Professor in Commerce
K.E College Mannanam
Kerala.
divyaj.kec@gmail.com
&
DR.MATHEW JACOB
Associate Professor of Commerce
St.Peter's College, Kolenchery, Kerala &
Research Guide in CMS College, Kottayam

Abstract

Tourism is a major engine of economic development and an important source of employment and foreign exchange earnings in many countries, including India. But the negative effects of tourism activities resulted in the introduction of sustainable tourism practices. Responsible tourism, aimed at sustainable tourism development, has been practiced in the state of Kerala since 2008. This paper examines the implementation of responsible tourism in Kerala state and also reviews the role of responsible tourism in economic development.

Keywords: *Responsible tourism, Triple Bottom Line, Economic development.*

Introduction

Tourism is one of the largest and fastest growing service industries (Creaco&Querini, 2003; World Travel & Tourism Council, 2019) globally. It represents one of the main industries in terms of job creation and economic development. (Niñerola, Sánchez-Rebull, & Hernández-Lara, 2019). Tourism enhances economic growth by job creation, source of foreign exchange earnings, and development of regions with potential for tourism (Tiwari &Anjum, 2016).

According to World Travel and Tourism Council (2019), the contribution of tourism and travel in world GDP is estimated as 10.40 percent. India's travel and tourism sector ranks 7th in the

THINK INDIA JOURNAL

ISSN:0971-1260
Vol-22- Issue-14-December-2019

Topological Indices: Study of a Chemical Molecular Structure

E.M. Suji [1*], S.J.Kalayathankal[2]

[1*]Department of Mathematics, Catholicate College, M.G University, Pathanamthitta, India

[2] Department of Mathematics, K.E College, M.G University, Mannanam, India

e-mail: sujielizabethmathew@gmail.com, sunnyjoseph2014@yahoo.com

Corresponding Author: sujielizabethmathew@gmail.com, Tel.: +09496302722

Abstract: There is an inherent connection between the chemical properties of chemical compounds and drugs (eg: boiling point and melting point) and their molecular structure. The physical features, chemical reactivity and biological activity of the chemical molecular structures can be understood by topological indices. The lack of chemical experiments can make up the study of topological indices on chemical structure of chemical materials and drugs and it can provide a theoretical basis for manufacturing drugs and chemical materials. In this paper some chemical characteristics of chemical compounds are revealed using topological indices, which may help in pharmaceutical engineering.

Keywords :Sum Connectivity Index, General Randić Index, General Harmonic Index, The first and second Zagreb Indices, The third Zagreb Index, Multiplicative version of first and second Zagreb Indices ,Redefined version of Zagreb Indices.

1.INTRODUCTION

Chemical and pharmaceutical techniques are rapidly increasing in these years. To determine the chemical and physical properties of a chemical compound, we need too many chemically based experiments. But the topological indices reduce the work of chemical experiments. Using topological indices, we can find out physical or chemical and biological features of a molecular structure.

The topological index of a molecular structure is a numerical quantity which gives values to the molecular structure and its branching pattern. There are various indices applied in chemical engineering which helps to find out the relationship between molecular structure and their chemical– physical characteristics. It includes Zagreb Index [1], Randić Index [2], Harmonic Index, General Sum Connectivity Index [3,4].

In mathematical chemistry, chemical compounds are expressed as graphs in which each vertex represents an atom of a molecule structure and each edge implies covalent bonds between two atoms.

Let G = (V, E) be a simple graph with vertex set V(G) = $v_1, v_2, v_3, \ldots v_n$ and edge set E(G) = $e_1, e_2, e_3, \ldots e_n$and $|V(G)|$ and $|E(G)|$ are cardinalities of V(G) and E(G). d(u) denote the

THINK INDIA JOURNAL

ISSN:0971-1260
Vol-22- Issue-14-December-2019

Data Mining Applications in Higher Education and Innovation Advancements

Sajan Mathew[1*] , John T.Abraham [2], Sunny Joseph Kalayathinal[3]

[1*] Dept. of Computer Science, St. Marys's HSS, Kaliyar, Idukki Dist, Kerala,
[2] Dept of Computer Science, Bharata Mata College, Thrikkakara, Kochi
[3] Dept of Mathematics, KE College, Mannanam

sajanmath@gmail.com, johntabraham@yahoo.com, sunnyjoseph2014@yahoo.com

[*]Corresponding Author: sajanmath@gmail.com, Tel.: +91 98477 43335

Abstract - One among a large group of late innovation advancements, information mining is rolling out improvements to the whole cosmetics of our abilities and safe places in data examination. Not exclusively does it present a variety of new ideas, strategies, and expressions, it likewise leaves from the entrenched, conventional, theory based factual methods. Information mining is another kind of exploratory and prescient information examination whose reason for existing is to portray orderly relations between factors when there are no (or deficient) from the earlier desires with regards to the idea of those relations.

Keywords - innovation advancements, information mining, DHSE, CV Camp

I. INTRODUCTION

The disclosure of concealed examples in instructive information is a promising examination in Educational Data Mining. The understudies accomplishment rate were decreased persistently is the real issue in advanced education. To expand the achievement rate of understudies the early conjecture strategy will assist the administration with counseling the poor understudies at perfect time. To find the new examples from different information the information mining approach is generally utilized. Similarly here the information mining is utilized as a part of instructive field to extricate concealed examples. Characterization is utilized to arrange the records in view of the planning set and furthermore it utilizes the example to order the new records.This paper means to demonstrate the different strategies of Educational information mining that aides the administration to make better move on understudies in danger.

The money related arrangement of the nation is straightforwardly relies upon the understudies training which has an effect in businesses. The magnificence of instructive foundations is seen by the achievement rate of understudies and the range of abilities of the establishments will be estimated by held rate of understudies in danger. The distinctive viewpoints like individual, social and mental will be valuable to gauge understudy scholastic execution. This may prompt find the understudies who are in hazard and it assist the administration with taking opportune activity. The understudy scholastic execution will be estimated by their financial and past scholarly exhibitions. This procedure will be performed by utilizing instructive information mining systems. The assurance of classes will be made before inspecting the information so it is likewise alluded to as directed learning.

In light of the past scholastic exhibitions and Socio-financial circumstances the understudy exhibitions were estimated through Data mining systems.

Order maps the information into predefined sets or gatherings of classes. Usually alluded to as administered learning in light of the fact that the classes are determined before analyzing the information. Examples that are found by Data Mining techniques from instructive information can be utilized to upgrade basic leadership as far as recognizing understudies in danger, diminishing understudy drop-out rate, expanding understudy's prosperity and expanding understudy's learning result. The primary destinations of this investigation are ID of various variables which influences an understudy's learning conduct and execution amid scholastic profession. Development of an expectation display utilizing grouping information mining procedure based on recognized prescient factors and concentrate legitimate data

Characterization of Interval-Valued Fuzzy Bridges and Cutnodes

Ann Mary Philip[1,b], Sunny Joseph Kalayathankal[2,c] and Joseph Varghese Kureethara[3,a]

[1]*Assumption College, Changanacherry, Kerala, India*
[2]*Kuriakose Elias College, Mannanam, Kerala, India*
[3]*CHRIST (Deemed to be University), Bangalore, Karnataka, India*

[a]Corresponding author: frjoseph@christuniversity.in
[b]anmaryphilip@gmail.com
[c]sunnyjoseph2014@yahoo.com

Abstract. In this paper, we characterize interval - valued fuzzy bridges and interval- valued fuzzy cutnodes in terms of α strong arcs. We discuss about the behaviour of arcs in a strongest path of an interval - valued fuzzy graph. An example is provided to prove that strongest paths are not in general related to strong paths in an interval - valued fuzzy graph. Finally we give a particular condition under which strong paths and strongest paths are equivalent.

INTRODUCTION

In 1975, Rosenfeld [8] developed the concept of fuzzy graphs whose basic idea was introduced by Kaufmann [4] in 1973. Various generalizations of fuzzy graph theory are defined and studied by researchers in this field. Among them IVFGs introduced by Hongmei and Lianhua [3] in 2009 is a simple and a very important generalization of fuzzy graph theory.Let $G^\star = (V, E)$ be a crisp graph.Then an interval - valued fuzzy graph (IVFG) G on $G^\star$ is defined as a pair $G = (A, B)$, where $A = [\mu_A^-(x), \mu_A^+(x)]$ is an interval - valued fuzzy set [1] on V and $B = [\mu_B^-(xy), \mu_B^+(xy)]$ is an interval - valued fuzzy set on E such that $\mu_B^-(xy) \leq \min\{\mu_A^-(x), \mu_A^-(y)\}$ and $\mu_B^+(xy) \leq \min\{\mu_A^+(x), \mu_A^+(y)\}$ for all $xy \in E$.If equality holds in the above inequality for all $x, y \in V$, then G is called a complete IVFG(CIVFG).

Many fuzzy graph theoretic concepts are yet to be properly generalized to the case of IVFGs. With this aim, we studied about interval valued fuzzy bridges, interval - valued fuzzy cutnodes [7] and different kinds of arcs in IVFGs [11]. This paper is a continuation of these two papers and in this paper we characterize interval - valued fuzzy bridges and interval - valued fuzzy cutnodes using α strong arcs defined in [11]. Also we present some properties of various kinds of arcs.The characterization of interval- valued fuzzy bridges and cutnodes and the detailed study of arcs presented in this paper will surely shed more light on the analysis of the structure of IVFGs. The concepts of interval-valued fuzzy trees, interval-valued fuzzy cycles and interval-valued fuzzy blocks are yet to be defined. Our intension is to define them and to use the results provided in this work to characterize them. This approach for studying the structure of IVFGs has not been addressed yet in the literature of IVFGs. These are the motivations behind our work. Further in this work, the behaviour of arcs in a strongest path of an IVFG is also examined in detail. In fuzzy graph theory, strongest path plays a very important role in the study of the structure of fuzzy graphs. Thus in the case of IVFGs also, strongest paths will have a crucial role. In IVFGs strongest path need not exist always as in the case of fuzzy graphs. This work provides a sufficient condition for the existence of a strongest path joining every two nodes in an IVFG. It also serves as a criteria for the equivalence of strongest paths and strong paths.

Recent Developments in Mathematical Analysis and Computing
AIP Conf. Proc. 2095, 030002-1–030002-7; https://doi.org/10.1063/1.5097513
Published by AIP Publishing. 978-0-7354-1825-7/$30.00

Malaya Journal of Matematik, Vol. 7, No. 2, 309-313, 2019

https://doi.org/10.26637/MJM0702/0025

On different kinds of arcs in interval valued fuzzy graphs

Ann Mary Philip[1], Sunny Joseph Kalayathankal[2] and Joseph Varghese Kureethara[3*]

Abstract

Type I strong arcs, Type II strong arcs, left feeble arcs, right feeble arcs and weak arcs in an Interval Valued Fuzzy Graph (IVFG) are introduced in this paper. We obtain a characterization of weak arcs. If every two arcs are comparable in an IVFG, then it contains only α strong arcs and weak arcs. An arc in an IVFG is a weak arc if and only if it is the unique weakest arc of at least one cycle in it.

Keywords

Interval valued fuzzy graph, Arc, Strong arc, Comparable arcs.

AMS Subject Classification

05C72, 08A72, 03E72.

[1] *Department of Mathematics, Assumption College, Mahatma Gandhi University, Changanacherry-686104, India.*

[2] *Department of Mathematics, Kuriakose Elias College, Mahatma Gandhi University, Kottayam-686561, India.*

[3] *Department of Mathematics, CHRIST (Deemed to be University), Bengaluru-560029, India.*

***Corresponding author**: [3]frjoseph@christuniversity.in; [1]anmaryphilip@gmail.com; [2]sunnyjoseph2014@yahoo.com

Article History: Received **19** December **2018**; Accepted **09** March **2019**

Contents

1. Introduction

Graph theoretic terms used in this work are either standard or are explained as and when they first appear. We consider only simple graphs. That is, graphs with multiple edges and loops are not considered. The notion of interval-valued fuzzy set is introduced by Zadeh[15] as an extension of fuzzy set [14]. Fuzzy graph was defined by Rosenfeld [11].

Hongmei and Lianhua introduced interval - valued fuzzy graphs(IVFG) [4]. It is a generalization of fuzzy graphs developed in [7] and [11]. Penetration of interval valued fuzzy graphs in the the arena of algebraic structures can be seen in [5] and [2].

Definition 1.1. *Let $G^* = (V,E)$ be a crisp graph.Then an interval - valued fuzzy graph (IVFG) G on G^* is defined as a pair $G = (A,B)$, where $A = [\mu_A^-(x), \mu_A^+(x)]$ is an interval - valued fuzzy set [1] on V and $B = [\mu_B^-(xy), \mu_B^+(xy)]$ is an interval - valued fuzzy set on E such that $\mu_B^-(xy) \leq \min\{\mu_A^-(x), \mu_A^-(y)\}$ and $\mu_B^+(xy) \leq \min\{\mu_A^+(x), \mu_A^+(y)\}$ for all $xy \in E$.*

The study of IVFGs is growing fast and has so many applications. [1] defined some operations on IVFGs and investigated their properties. Regular and edge regular IVFGs were studied in [12]. Interval – valued fuzzy bridges and interval – valued fuzzy cutnodes were defined in [10].

In crisp graph theory, study of the nature of arcs is not very significant as all arcs are strong in the sense of [3]. But in fuzzy graph theory and interval - valued fuzzy graph theory, study of the various characteristics of different types of arcs is indispensable as it gives us a better idea of the structure of graphs. It helps us to study many of their properties. Bhutani and Rosenfeld[3] classfied arcs into strong and non strong arcs.

Arcs in intuitionistic fuzzy graphs were studied in [6] and [9]. In [8], four different types of arcs were introduced with a detailed study of them. Strong arcs are divided into α strong arcs and β strong arcs and non strong arcs are classified into δ arcs and δ^* arcs. But when we come to the case of IVFGs, these classifications are not sufficient. So in this paper, we define nine different types of arcs and make an earnest effort to study the various characteristics of these arcs.

The concepts such as strongest path, unique strongest

A Fuzzy Computing Software Quality Model

Sunny Joseph Kalayathankal[1,2,b)], John T. Abraham[3,c)] and Joseph Varghese Kureethara[4,a)]

[1]*Research Scholar, R & D Centre, Bharathiar University, Coimbatore, Tamil Nadu - 641046*
[2]*Kuriakose Elias College, Mannanam, Kerala - 686561*
[3]*Bharatha Matha College, Cochin, Kerala - 682021*
[4]*CHRIST (Deemed to be Univeristy), Bengaluru, Karnataka - 560029*

[a)]Corresponding author: frjoseph@christuniversity.in
[b)]sunnyjoseph2014@yahoo.com
[c)]johntabraham@yahoo.com

Abstract. Expectation of the quality of a software varies from user to user. A fuzzy approach to measure the quality of a software is very appropriate so that it can deal with non-crisp aspects of the various parameters. In the proposed model, ordered intuitionistic fuzzy soft sets (OIFSS) and relative similarity measures of OIFSS are considered in the backdrop of fuzzy multiple criteria decision making (FMCDM) approach.

INTRODUCTION

No electronic system works without a software to guide it. Machine is lifeless in the absence of a software programme. The more efficient the software, the better the machine is. Measuring the efficiency of a machine is done mainly by measuring the efficiency of the software it runs. Although softwares made human life simple, human beings are always in the quest for better softwares.? Although an objective evaluation may not be possible as it is a matter of quality, scores of measurement parameters are available. An almost perfect checking is possible only by introducing numerous components in the quality checking model. Our attempt here is to introduce a model that uses the approach of fuzzy multiple criteria decision making (FMCDM). Simultaneously, we propose new similarity measures among ordered intuitionistic fuzzy soft sets (OIFSSs).

Although Software Engineering is seemingly a new term, it has its origin four decades ago in 1968. In the NATO Science Committee sponsored conference held at Garmisch, Germany, Anthony A. Oettinger introduced it. He was elected President of the Association for Computing Machinery (US) [1]. Until then, engineering was associated with machines. Nonetheless, engineering is a process as well. These days engineering is tagged with numerous fields such as mind, body, life, to name a few. Wherever creativity and cleverness are used, engineering is applied. To assure quality and to measure the performance, software engineers and entrepreneurs together and separately came up with measuring mechanisms [2].

SOFTWARE QUALITY FACTORS

When dealing with software, the most important factors determining a good software are its timeliness in production, cost-effectiveness, and efficiency in execution. International Organization for Standardization (ISO) has reviewed and confirmed in 2017, ISO/IEC 25010:2011 as the standard [3]. Detailed descriptions of software quality assessment are found in [4], [5] and [6]. The two models available in the literature are "Quality in use Model" and "Product Quality Model".

This is an era of technology driven life. Human beings consider electronic gadgets as their closest friends. You read this because you are technically sound. We are embedded in and with applied science and technology. There is

Emerging Trends in Mechanical Engineering 2018
AIP Conf. Proc. 2080, 050004-1–050004-6; https://doi.org/10.1063/1.5092932
Published by AIP Publishing. 978-0-7354-1810-3/$30.00

PHYSICAL REVIEW C **101**, 014616 (2020)

Evaporation-residue-gated spin distribution measurements of the highly fissile compound nucleus ^{224}Th* through ^{16}O + ^{208}Pb and ^{18}O + ^{206}Pb reactions

M. M. Hosamani,[1,*] N. M. Badiger,[1] N. Madhavan,[2] I. Mazumdar,[3] S. Nath,[2] J. Gehlot,[2] A. K. Sinha,[4] S. M. Patel,[3] P. B. Chavan,[3] T. Varughese,[2] Vishal Srivastava,[2,†] Md. Moin Shaikh,[2,‡] P. Sandya Devi,[5] P. V. Laveen,[6] A. Shamlath,[6] M. Shareef,[6] S. K. Duggi,[5] P. V. Madhusudhana Rao,[5] G. Naga Jyothi,[5] A. Tejaswi,[5] P. N. Patil,[1] A. Vinayak,[1] K. K. Rajesh,[7] Abhishek Yadav,[2,§] A. Parihari,[2] Rohan Biswas,[2] Monalisha Dhibar,[8] D. P. Kaur,[9] M. Ratna Raju,[5] and J. Joseph[10]

[1]*Department of Studies in Physics, Karnatak University, Dharwad - 580003, India*
[2]*Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi - 110067, India*
[3]*Tata Institute of Fundamental Research, Mumbai - 400005, India*
[4]*UGC-DAE Consortium for Scientific Research, Kolkata Centre, Kolkata 700098, India*
[5]*Department of Nuclear Physics, Andhra University, Visakhapatnam - 530003, India*
[6]*Department of Physics, Central University of Kerala, Kasaragod - 671314, India*
[7]*Department of Physics, University of Calicut, Kerala - 673635, India*
[8]*Department of Physics, Indian Institute of Technology, Roorkee - 247667, India*
[9]*Department of Physics, Panjab University, Chandigarh - 160014, India*
[10]*Kuriakose Elias College, Mannanam, Kerala - 686561, India*

(Received 5 June 2019; revised manuscript received 19 November 2019; published 23 January 2020)

Measurements of cross sections of evaporation residue (ER) and spin distributions of heavy nuclei, produced via compound nuclear fusion-evaporation reactions, provide crucial information about the dynamics of nuclear fission and the survival probability of the system against fission. Such measurements help in probing the evolution of the compound system from equilibrium to the saddle and the underlying role of nuclear dissipation in hindering fission. The purpose of the present measurements is to understand the survival probability of the ^{224}Th* compound nucleus against fission and its dependence on angular momentum. Measurements of the ER cross sections and spin distributions have been carried out for the ^{16}O + ^{208}Pb and ^{18}O + ^{206}Pb reactions which form the same ^{224}Th* compound nucleus. The two reactions have been carried out at laboratory energies ranging from 87 MeV to 122.6 MeV and 85.7 MeV to 121.4 MeV, respectively. The measurements have been performed at Inter University Accelerator Centre, New Delhi using the Hybrid Recoil mass Analyzer in gas-filled mode, coupled with the 4π spin spectrometer of Tata Institute of Fundamental Research. The reduced ER cross sections ($\sigma_{ER}/\pi R_B^2$) for both systems are comparable at low excitation energies while at higher excitation energies the ^{18}O + ^{206}Pb system shows nearly 50% higher values. However, the ^{18}O + ^{206}Pb system shows lower mean γ ray multiplicity (and hence lower mean angular momentum) at all excitation energies which is a surprising result.

DOI: 10.1103/PhysRevC.101.014616

I. INTRODUCTION

Heavy-ion-induced nuclear fusion-evaporation reaction is a well established tool to understand the nuclear dynamics at different stages of fusion-fission process and the associated time-scale. The dynamic properties of a fused compound nuclear system can be studied by measuring the evaporation spectra of neutrons, charged particles, giant dipole resonance (GDR) γ rays and evaporation residues (ERs). The evolution of the compound system from the initial equilibrium state to the scission point as a function of the deformation can be mapped by studying the different evaporation spectra. The emitted particle/radiation (charged particles, neutrons, and γ rays) also serve as clocks for the dynamically evolving system. The observed excess of pre-scission particles and GDR γ rays in comparison with standard statistical model predictions indicates hindrance to the fission process. Frobrich *et al.* [1] pointed out that ERs are the most sensitive and suitable probes for studying the dynamics of fusion-fission process in pre-saddle region. The hindrance in nuclear fission process due to nuclear viscosity increases the pre-saddle and/or pre-scission life time of compound nucleus (CN) and leads to enhanced yields of evaporation residues. Therefore, measurements of ER cross sections and spin distributions would, undoubtedly, provide the necessary information on nuclear fission and the possible role of nuclear viscosity hindering it. It is also understood that the ER production cross section is the only

*mutturajh735@gmail.com
†Present address: Racah Institute of Physics, The Hebrew University of Jerusalem, Jerusalem - 91904, Israel.
‡Present address: Variable Energy Cyclotron Centre, 1/AF, Bidhan Nagar, Kolkata - 700064, India.
§Present address: Department of Physics, Jamia Millia Islamia, New Delhi - 110025, India.

Asian Journal of Chemistry; Vol. 31, No. 10 (2019), 2269-2274
ASIAN JOURNAL OF CHEMISTRY
https://doi.org/10.14233/ajchem.2019.22138

Synthesis, Spectroscopic Characterization, Antibacterial and Short Term *in vitro* Cytotoxicity Studies of Copper(II) Complexes of Novel Tridentate N,N,S Donor Ligand 2-Benzoylpyridine-N(4),N(4)-(N,N-diethyl-N-methylamine-2,2'-diyl)thiosemicarbazone

JANEY MARY MATHEW[1,*], VARUGHESE PHILIP[2] and JESTY THOMAS[3]

[1]Department of Chemistry, Catholicate College, Pathanamthitta-689642, India
[2]Post Graduate and Research Department of Chemistry, St. Thomas College, Kozhencherry-689645, India
[3]Research Department of Chemistry, Kuriakose Elias College, Mannanam-686561, India

*Corresponding author: E-mail: janeyginu@gmail.com

Received: 17 April 2019; *Accepted*: 20 May 2019; *Published online*: 30 August 2019; AJC-19534

A tridentate N,N,S-donor ligand, 2-benzoylpyridine-N(4),N(4)-(N,N-diethyl-N-methylamine-2,2'-diyl)thiosemicarbazone (Hbptsc) has been synthesized and characterized by elemental CHN analysis, UV-visible, FT-IR and ^{1}H NMR spectroscopy. Copper(II) complexes of the ligand, Hbptsc synthesized have been characterized by elemental analysis, UV-visible spectra, FTIR spectra and EPR spectroscopic simulation. The complexes hold the stoichiometry of the type [CuLX] where X= Cl (1), NO_3 (2), SO_4 (3), N_3 (4), SCN (5) confirmed by the molar conductivity studies of 10^{-3} M solutions in DMF at room temperature. The EPR spectra of the complexes recorded in DMF at 77 K shows an axial type spectra with two distinct g-values, $g_{\parallel}$ and $g_{\perp}$ indicating a four coordinated planar geometry. The antimicrobial studies of the copper(II) complexes shows an appreciable activity against both gram positive and gram negative bacteria using streptomycin as positive control. The short term *in vitro* cytotoxicity studies following trypan blue dye exclusion method exhibits pronounced activity against the Dalton's Lymphoma Ascites tumour cells extruded from the peritoneal cavity of mice.

Keywords: Thiosemicarbazone, 2-Benzoylpyridine, Copper(II) complexes, Antitumour activity.

INTRODUCTION

Thiosemicarbazones and their metal complexes have been extensively studied during recent years mainly because of their various biological properties [1,2]. These complexes show high chelating behaviour especially with the metal ions of the first row transition and main group elements, bonding through sulphur and azomethine nitrogen atoms [3]. Thiosemicarbazones and their transition metal complexes have a wide range of biological activities, some of them being antiviral, antifungal, antibacterial, antitumor anticancerogenic antioxidant besides showing insulin mimetic effects too. In solid state, they exist in the thione form and in solution they exist as an equilibrium mixture of both thione and thienol forms which is essential for explicit chelating behaviour.

Previous studies indicate the planar nature of biologically active thiosemicarbazones with heterocyclic bases giving rise to NNS tridentate system [4]. The third donor atom, present in the ring of heterocyclic thiosemicarbazones (N in the case of the pyridine ring, O in the case of pyridine *N*-oxide) makes them potentially tridentate. The combination of heterocyclic ring with azomethine moiety exerts potential biological and catalytic activities [5]. The activity is found to be highly pronounced where the thiosemicarbazone gets attached through the 2-position of the heterocyclic system and the activity diminishes when the point of attachment is shifted further to 3 or 4-positions presumably due to lower coordination ability. In this work we report the synthesis, spectral characterization and short term *in vitro* cytotoxicity results of the ligand, Hbptsc and its copper(II) complexes.

EXPERIMENTAL

2-Benzoylpyridine (Aldrich), N-Methyl piperazine (Aldrich), $CuCl_2{\cdot}2H_2O$, $CuSO_4{\cdot}5H_2O$, $Cu(NO_3)_2{\cdot}3H_2O$, $Cu(OAc)_2{\cdot}H_2O$, NaN_3 and KSCN (E. Merck) were used as received. All the solvents were distilled before use.

© 2019 IJRAR March 2019, Volume 6, Issue 1 www.ijrar.org (E-ISSN 2348-1269, P- ISSN 2349-5138)

Short Term *In Vitro* Cytotoxicity Studies Of Zn (II) Complexes Of A Tridentate N, N, S -Donor Thiosemicarbazone Ligand, H*bptsc* Synthesised From 2-Benzoylpyridine And Piperazine Base.

*Corresponding Author - Janey Mary Mathew, Post-Graduate Department of Chemistry, Catholicate College, Pathanamthitta, Kerala, India.
[1]Author - [1]Jesty Thomas, Research Department of Chemistry, K.E.college, Mannanam, kottayam, kerala, India.

Abstract

The first row transition metal ions of the substituted thiosemicarbazones have been an area of special interest owing to their biological properties. Zinc metal ions in particular have a number of very interesting biological activities. Three zinc metal ion complexes of the N, N, S-donor ligand, **Hbptsc** were synthesised by refluxing equimolar amounts of the ligand, **Hbptsc** and the metal salts in methanol at constant temperature. These were characterised by elemental CHN studies. The ligand, **Hbptsc** was synthesised following the procedure reported of J.Scovill et al. Molar conductivity studies of the zinc complexes in 10^{-3}M solutions of DMF at room temperature showed a non - electrolytic nature with the stoichiometry of the type [Zn(bptsc)X],where X= Cl^-, N_3^- and NO_3^-.The short term *in vitro* cytotoxicity studies of these complexes were done following trypan blue dye exclusion method using the Dalton's Lymphoma Ascites tumour cells extruded from the peritoneal cavity of mice.

Keywords: Thiosemicarbazone, 2-Benzoylpyridine, Dalton's Lymphoma Ascites, cytotoxicity

Introduction

The ligands and the metal complexes of thiosemicarbazone functional group, with N and S donor atoms have been extensively studied during recent years mainly because of their various biological properties [1,2].

The complexes of metals of column 12 constitute an especially attractive topic in view of the marked differences among these metals as regards both chemical behavior and biological activity. Zn(II) is an essential ion because of its presence in certain metalloenzymes while cadmium and mercury, present in the environment, are toxic but only recent studies have considered the reactivity of macroligands containing sulfur with zinc, cadmium and mercury [3]. Thiosemicarbazones usually act as chelating ligands with transition metal ions, bonding through their sulfur and hydrazine nitrogen atoms [4]. Tridentate NNS donor

Macromolecular Research Article

DOI 10.1007/s13233-019-7004-9 www.springer.com/13233 pISSN 1598-5032 eISSN 2092-7673

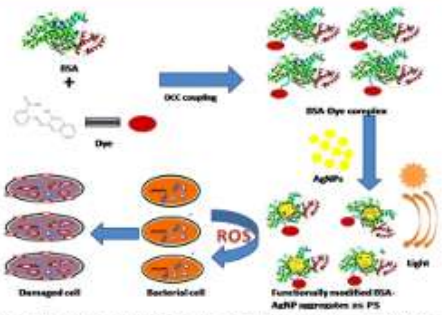
Photochemical Studies and Photoinduced Antibacterial Properties of Silver Nanoparticle-Encapsulated Biomacromolecule Bovine Serum Albumin Functionalised with Photoresponsive Chromophoric System 2-[(E)-(3-Hydroxynaphthalen-2-yl) diazenyl] Benzoic Acid

Linta Maria Jose[1,2]
Sunny Kuriakose*[,1]

[1] Research and Post Graduate Department of Chemistry, St. Thomas College, Pala-686574, Mahatma Gandhi University, Kottayam, Kerala, India
[2] Research and Post Graduate Department of Chemistry, K. E. College, Mannanam-686561, Mahatma Gandhi University, Kottayam, Kerala, India

Received March 7, 2018 / Revised June 1, 2018 / Accepted June 2, 2018

Abstract: This study establishes the synthesis of silver nanoparticles (AgNPs), synthesis of a photoresponsive system 2-[(E)-(3-hydroxynaphthalen-2-yl) diazenyl] benzoic acid, and encapsulation of AgNPs into the biomacromolecular system, bovine serum albumin (BSA) functionally modified with the photoactive system by means of DCC coupling. The optical properties, structural properties, morphology, and size distribution were confirmed by various characterisation techniques such as ultraviolet (UV)/visible, Fourier transform infrared (FTIR), nuclear magnetic resonance (NMR), photoluminescence (PL) spectroscopy, scanning electron microscopy (SEM), transmission electron microscopy (TEM), and X-ray diffraction analysis (XRD). The photo responsive behaviour of the functionally modified BSA and nanoparticle dispersed system were investigated. The antibacterial effects of AgNPs and photo induced antimicrobial properties of the functionally modified BSA-AgNP conjugates were evaluated against some selected bacterial strains such as *Corynebacterium diphtheriae (gram +ve), Bacillus cereus (gram +ve), Raoultella ornithinolytica (gram -ve),* and *Salmonella typhimurium (gram -ve)* using disc diffusion. We found that silver nanoparticles encapsulating functionally modified BSA seem to be an effective photoactive antimicrobial agent against the multidrug resistant strains of bacteria with better photo responsive properties and with wide applications in antimicrobial photodynamic therapy (APDT).



Keywords: silver nanoparticle, 2-[(E)-(3-hydroxynaphthalen-2-yl) diazenyl] benzoic acid, bovine serum albumin, DCC coupling, encapsulation.

1. Introduction

Over the past few years, the burden of infection by pathogenic bacteria, fungi and viruses have been lifted due to the great ingenuity shown by the microbes in formulating mechanisms for circumventing the destructive action of various antimicrobial agents. Various researches are going on to face the deadly challenges caused by the antibiotic resistant microbes all over the world. Photodynamic therapy (PDT) receives special attention in this regard. Photodynamic therapy (PDT) is a clinical procedure which involves the use of light sources to destroy undesired cells or microorganisms by a combination of light and a photosensitizing agent (PS), which induces chemical changes in another molecule known as substrate.[1,2] One of the emerging field of PDT is antimicrobial photodynamic therapy (APDT), which is used for the treatment of infections because the reactive oxygen species (ROS) produced during the irradiation of a PS can cause the destruction of microorganisms.[3,4] In order to enhance the efficiency of APDT, different approaches have been employed in developing and designing new class of PS using nanoparticles, especially metal nanoparticles, in which the coupling of nanotechnology to PDT has been applied.

Metal nanoparticles can be used for enhancing the photodynamic activity for singlet oxygen generation by increasing the triplet yield of the PS through coupling to surface plasmons.[5,6] Various studies have been reported showing the generation of singlet oxygen by nanoparticle bound photosensitizer systems.[7,8] Metallic nanoparticles encapsulated in biocompatible and biodegradable matrices like cyclodextrin, starch, cellulose, chitosan, and polypeptides like bovine serum albumin (BSA) functionalised with certain photochromic systems can be used as special photosensitizers in order to improve the antimicrobial performance in APDT since the application of APDT is likely to be medical or environmental situations.

Silver nanoparticles (AgNPs) have got special attention due to their distinctive properties and because of their wide applications in various areas such as in medical field as antimicro-

Acknowledgments: This work was supported financially by the University Grants Commission, New Delhi, India (Grant No.MRP(S)/13-14/KLMG 027/UGC-SWRO).

***Corresponding Author:** Sunny Kuriakose (skresearchgroup@rediffmail.com)

THINK INDIA JOURNAL

ISSN:0971-1260
Vol-22- Issue-14-December-2019

On Dynamic Cumulative Past Entropy Generating Function

Smitha S. G.[1], Rajesh[2] and Baby A. K.[2]
[1]Department of Statistics, K. E College, Mannanam
[2]Department of Statistics, CUSAT, Cochin-22.

Abstract: In this paper we propose a dual concept of cumulative residual entropy generating function and studied its properties. The derivative of this new measure is the cumulative past entropy introduced by Di Crescenzo and Longobardi (2009). We also define the dynamic cumulative past entropy generating function and give its properties. It is shown that the proposed measure uniquely determines the distribution. Finally we characterized certain lifetime distributions using the functional form of the proposed measure.

Keywords: Power distributions, Past Entropy, Cumulative Past Entropy, Reliability.

1. Introduction

Entropy is an important concept in the field of information theory and Shannon (1948) was the first who formally introduced the concept of entropy. Let X be an absolutely continuous non-negative random variable with probability density function (p.d.f) f, the Shannon's entropy is defined as

$$H(X) = -\int_0^\infty f(x)\log f(x)\, dx. \tag{1}$$

Suppose X represents the lifetime of a unit, then $H(X)$ can be used for measuring the associated expected uncertainty. Rao et. al. (2004) introduced a new measure of uncertainty based on the survival function of the non-negative random variable X with distribution function (d.f) $F(x)$, called cumulative residual entropy and obtained some properties. It is defined as,

$$\xi(X) = -\int_0^\infty \bar{F}(x)\log\bar{F}(x)\, dx, \tag{2}$$

where the survival function $\bar{F}(x) = 1 - F(x)$. This measure is considered to be more stable since d.f. is more regular than p.d.f and also the d.f. exists even cases where density does not. For more properties and applications of this measure one can refer Rao et. al. (2004).

Asadi and Zohrevand (2007) considered the dynamic cumulative residual entropy function and is defined as

$$\xi_X(t) = -\int_t^\infty \frac{\bar{F}(x)}{\bar{F}(t)}\log\frac{\bar{F}(x)}{\bar{F}(t)}\, dx. \tag{3}$$

Di Crescenzo and Longobardi (2009) introduced cumulative past entropy, which is given by

$$\bar{\xi}_X = -\int_0^\infty F(x)\log F(x)\, dx. \tag{4}$$

In many realistic situations, uncertainty is not necessarily related to the future but can also refer to the past. In such situations Dicrescenzo and Longobardi (2009) introduced dynamic cumulative past entropy, which is given by

$$\bar{\xi}_X(t) = -\int_0^t \frac{F(x)}{F(t)}\log\frac{F(x)}{F(t)}\, dx. \tag{5}$$

ScienceDirect

Catalysis Today

Volume 310, 15 July 2018, Pages 11-18

Synthesis of Sm^{3+}-doped graphitic carbon nitride nanosheets for the photocatalytic degradation of organic pollutants under sunlight

Jesty Thomas, Ambili K.S., Radhika S.

Research Department of Chemistry, Kuriakose Elias College, Mannanam, Kottayam, Kerala 686561, India

Received 14 December 2016, Revised 15 May 2017, Accepted 20 June 2017, Available online 21 June 2017, Version of Record 27 April 2018.

What do these dates mean?

Check for updates

Show less

Share Cite

https://doi.org/10.1016/j.cattod.2017.06.029

Get rights and content

Happiness and performance at work

Pages: 1803-1805

Jesline Maria Mamen (Department of Psychology, Kuriakose Elias College Mannanam, Kottayam, Kerala)

Happiness is a crucial ingredient of well-being. No matter how different people's lives whether due to age, gender, culture, or life experience the desire for happiness is widespread. Regardless of culture, socioeconomic status and geography happiness appears to be universally recognized. Happy workplace fosters employee health and happiness while enhancing organizational performance and productivity. But for many people, the workplace is a highly stressful environment and this means it can be a damaging place for their mental health. The importance of happiness at workplace has grown over the last two or three decades as there has been a shift from physical to psychological sources of pressure at work. An economy in a downward spiral, rising unemployment, anxieties about future job loss, lack of access to affordable health care, crisis in the financial industry and declining consumer confidence are among some of the challenges creating significant stress in the lives of workers and their families. Much can be done to improve and sustain happiness at work and there are many possible approaches that can be taken. It is the purpose of this paper to explore: 1) Conceptual framework of happiness 2) Models of happiness (Sustainable Happiness model, PERMA model, Performance-Happiness model) 3) Happiness enhancing activities 4) Positive Psychological Capital 5) Positive Organisational Behavior 6) Benefits of happiness. Happiness is healthy and adaptive up to a point, but like all things, it requires balance. Research studies show that even though happiness is beneficial, yet psychologically it can become maladaptive. This paper also discuss on the downside of happiness.

Categories: IAHRW International Journal of Social Sciences Review, Issue 10, December, Volume 6, 2018

ScienceDirect

Materials Today: Proceedings

Volume 5, Issue 10, Part 1, 2018, Pages 21279-21284

Attractive dielectric responses with doping of Cr^{3+} and Ti^{4+} in $Sm_{1.5}Sr_{0.5}NiO_4$ ceramics

Kevin Abraham [a], A.K. Thomas [a], Jini Thomas [b], K.V. Saban [c]

[a] Smart Materials Analytical Research and Technology(SMART) Lab, Department of Physics, St Berchmans College, Changanacherry 686101 Kerala, India

[b] Department of Physics, Kuriakose Elias College, Mannanam, Kottayam, Kerala, India

[c] St. Aloysius College, Edathua, Alappuzha 689573, Kerala, India

Available online 30 October 2018, Version of Record 30 October 2018.

What do these dates mean?

Show less

Share Cite

https://doi.org/10.1016/j.matpr.2018.06.529

Get rights and content

Abstract

The doping effect of Cr^{3+} and Ti^{4+} in $Sm_{1.5}Sr_{0.5}Ni_{1-x}(Cr_x / Ti_x)O_4$ (x=0.05) on crystal structure, grain response and dielectric behavior are investigated over a wide temperature range (30- 200 °C) and frequency range (100 KHz – 10 MHz). The X-ray diffraction pattern confirms a single orthorhombic phase with space group *Fmmm*(69). Giant dielectric response is observed in these ceramics with considerable loss reduction in Ti^{4+} doped $Sm_{1.5}Sr_{0.5}NiO_4$ as compared to Cr^{3+}. Impedance spectroscopic studies reveal the contribution of grain and grain boundary to the colossal values of dielectric constant in these ceramics

Second International Conference on Materials Science and Technology (ICMST 2016) IOP Publishing
IOP Conf. Series: Materials Science and Engineering **360** (2018) 012049 doi:10.1088/1757-899X/360/1/012049

Origin of the high dielectric constant in $Sm_{2/3}Cu_3Ti_4O_{12}$ ceramics

A.K. Thomas[1], Kevin Abraham[1], Jini Thomas[2], K.V. Saban[3*]

[1] SMART LAB, Department of Physics, St. Berchmans College, Changanacherry, 686101, Kerala, India
[2] Department of Physics, Kuriakose Elias College, Mannanam, Kottayam, Kerala, India
[3] Principal, St.Aloysius College, Edathua, Alappuzha, Kerala,India

Email: kvsaban@gmail.com.

Abstract. The microstructure, crystalline structure, dielectric and electrical properties of polycrystalline $Sm_{2/3}Cu_3Ti_4O_{12}$ ceramics, prepared via conventional solid-state reaction were investigated. The structural evolution of these powders was analyzed by X-ray diffraction (XRD). Crystal structure investigated by Rietveld refinement was found to be cubic with space group *Im3*. It has been found that $Sm_{2/3}Cu_3Ti_4O_{12}$ ceramic shows giant dielectric permittivity values with low frequency (1 kHz) larger than 30,000 at room temperature. In the temperature domain, a new dielectric relaxation was clearly observed beyond 200 K, in addition to the well-investigated dielectric relaxation close to 100 K. This Maxwell–Wagner type of relaxation was found to be originating from the formation of external depletion layers at the electrode-sample interface. The dielectric relaxation at high frequencies in the dielectric dispersion spectra of $Sm_{2/3}Cu_3Ti_4O_{12}$ ceramics is caused by an IBLC effect associated with the insulating grain boundaries and the other one at low frequencies originates from an electrode polarisation effect. The activation energy of semi conducting grain is found to be similar to that of CCTO (~0.06 eV). The observed giant value of the dielectric constant in the $Sm_{2/3}Cu_3Ti_4O_{12}$ ceramics originates due to polarisation at the electrode- sample interface and at the insulating grain boundary interface. The results suggest that the IBLC effect mechanism that was formerly proposed for CCTO ceramics is also valid in explaining the high dielectric constant in the compositionally and structurally CCTO-like, $Sm_{2/3}Cu_3Ti_4O_{12}$ ceramics.

1. Introduction

Materials that exhibit colossal dielectric constant (CDC) have attracted significant attention because of their potential applications in electronic devices, such as high dielectric capacitors, capacitor sensors, and random access memories. Miniaturization as well as the production of low cost, highly efficient electronic components can be achieved using these materials. The recent discovery [1, 2] of "colossal" values of the dielectric constant, ε', up to about 10^5 in $CaCu_3Ti_4O_{12}$ (CCTO) has aroused tremendous interest. Recent research revealed that many compounds $ACu_3Ti_4O_{12}$ (A = $La_{2/3}$, $Y_{2/3}$,