QnM 3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the last five years

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3.3.1.1Total number of research papers published per teacher in the Journals notified on UGC website year wise during the last five years

2022	2021	2020	2019	2018	TOTAL
7	12	10	21	9	59

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3.3.1 Number of research papers published per teacher in the Journals notified on UGC website during the last five years

S.No.	Title of paper	Name of the author/s	Department of the	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object		
							Link to website of the	Link to article / paper /	Is it listed in UGC
					2022				
1	NUMERICAL SOLUTION OF FLUID AND PARTICLE PHASE ON VELOCITY OF HEAT WITH EFFECT OF MAGNETIC FIELD IN	Dr Dilip Dash	Applied Mathematics	Dogo Rangsang Research Journal UGC Care Group I Journal	2022	2347-7180	https://www.journal-dogorangsang.in/	http://surl.li/lbqmz	UGC
2	Green Chemistry in Pulp and Paper Technology	Preeti Nand Kumar, R.N.Shukla	APPLIED CHEMISTRY	Paripex Indian Journal of Research	2022	ISSN;2250-1991 (print)	https://www.worldwidejournals.com/paripex/	https://www.worldwidejournals.com/paripex/recent_issues_pdf/2022/January/green-chemistry-in-pulp-and-	UGC
3	cement with molasses addition on moulding properties in silica sand: A comparison	Praveen Kumar Bannaravuri, Anil Kumar Birru, Pulivarti	Mechanical Engineering	Recent Advances in Materials and Modern Manufacturing	2022	ISBN No: 978-981-19-0244-4	https://doi.org/10.1007/978-981-19-0244-4_72	https://doi.org/10.1007/978-981-19-0244-4_72	springer
4	Performance of Engineering Students by Artificial Neural Network	Handa, C.C., Kalbande, V.N. & Himte, R.L.	Mechanical	Applications in Mathematical Sciences	7/1/2022	09746803(E)	https://www.mililink.com/journals_desc.php?id=59	l?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjqlJLv3Kj	UGC-CARE ESCI
5	Application of ANN to Assess Employability of Undergraduate Students	Handa, C.C., **Gajghat, R.H.**, Rawandale, S.A. & Bodhe, A.B.	Mechanical	Advances and Applications in Mathematical Sciences	7/1/2022	09746803 (E)	https://www.mililink.com/journals_desc.php?id=59	https://www.mililink.com/issue_content.php?id=59&ild=401&vol=21&is=9&mon=July&yer=2022&pg=4871-5503	UGC-CARE ESCI
6	a gap between industrial and institutional skills at students in the faculty of engineering and natural	Rawandale, S.A., **Gajghat, R.H.**, Bodhe, A.B. & Handa, C.C.	Mechanical	International Journal of Health Sciences	5/1/2022	25506978 (P) 2550696X (E)	https://sciencescholar.us/journal/index.php/ijhs	https://doi.org/10.53730/ijhs.v6nS2.7329	Scopus
7	Application of ANN to Assess Employability of Undergraduate Students	Handa, C.C., **Gajghat, R.H.**, Rawandale, S.A. & Bodhe, A.B.	Mechanical	Advances and Applications in Mathematical Sciences	3/1/2022	09746803 (E)	https://www.mililink.com/journals_desc.php?id=60	https://www.mililink.com/issue_content.php?id=59&ild=401&vol=21&is=9&mon=July&yer=2022&pg=4871-5504	UGC-CARE ESCI

					2021				
1	Quantitative Analysis And Analytical Method Validation For API &Formulated Dosages Of	Preeti Nand Kumar, R.N.Shukla, (2021)	APPLIED CHEMISTRY	International Journal of Pharmaceutical Research,	2021	(ISSN -0975-2366)	http://www.ijpronline.com	https://doi.org/10.31838/ijpr/2021.13.02.238	Scopus
2	Linguistic Information for Decision Making Using SVM Published in Advances in data science	Dr Dilip Dash	Applied Mathematics	Advances in data science and Management Proceedings of	2021	2367-4512	https://doi.org/10.1007/978-981-16-5685-9	https://doi.org/10.1007/978-981-16-5685-9	Springer
3	Classification of crop based on macronutrients and weather data using machine learning	Dr Dilip Dash	Applied Mathematics	Results in Engineering (ELSEVIER)	2021	2590-1230	http://www.editorialmanager.com/rineng/Default.aspx	https://www.sciencedirect.com/science/article/pii/S2590123021000049	Elsevier
4	Simulation and Analysis of Speed Control of Electric Vehicle in MATLAB/Simulink	**Abhimanyu Mandal**, Akash Dewangan, Shashank Tiwari	Electrical Engineering	IRJET	2021	e-ISSN: 2395-0056	https://www.irjet.net/	https://www.irjet.net/archives/V8/i6/IRJET-V8I6234.pdf	Yes
5	Simulation and Analysis of Speed Control of Electric Vehicle in MATLAB/Simulink	Abhimanyu Mandal, **Akash Dewangan**, Shashank Tiwari	Electrical Engineering	IRJET	2021	e-ISSN: 2395-0056	https://www.irjet.net/	https://www.irjet.net/archives/V8/i6/IRJET-V8I6234.pdf	Yes
6	Simulation and Analysis of Speed Control of Electric Vehicle in MATLAB/Simulink	Abhimanyu Mandal, Akash Dewangan, **Shashank Tiwari**	Electrical Engineering	IRJET	2021	e-ISSN: 2395-0056	https://www.irjet.net/	https://www.irjet.net/archives/V8/i6/IRJET-V8I6234.pdf	Yes
7	Impact on the microstructure and mechanical properties of Al-4.5Cu Alloy by the	Praveen Kumar bannaravuri, Gadudasu Babu Rao, R Raja, K Ch	Mechanical Engineering	International Journal of Lightweight Materials and	2021	ISSN 2588-8404	https://www.sciencedirect.com/science/article/pii/S2588840421000093	https://www.sciencedirect.com/science/article/pii/S2588840421000093	ugc/scopus
8	Application of the Multiple Regression Analysis for Prediction of Green Compression	Rao, S., **Gajghat, R.H.** & Giri, P.K.	Mechanical	International Journal of All Research Education and	8/1/2021	24556211 (E)	http://www.ijaresm.com/	http://www.ijaresm.com/application-of-the-multiple-regression-analysis-for-prediction-of-green-	UGC
9	Application of the Multiple Regression Analysis for Prediction of Green Compression	**Rao, P.S.**, **Gajghat, R.H.** & Giri, P.K.	Mechanical	International Journal of All Research Education and	8/1/2021	24556211 (E)	http://www.ijaresm.com/	http://www.ijaresm.com/application-of-the-multiple-regression-analysis-for-prediction-of-green-	UGC
10	on Structural, Morphological and Optical Properties of CdS Nanocrystalline Films", Vol. 9, Issue No. 5, May	**Gokul Jaiswal**, Dipali Soren and Sandhya Pillai	Electronics & Telecommunication Engg.	International Journal of Creative Research Thoughts (IJCRT)	May 2021	ISSN : 2320 – 2882	https://www.ijcrt.org/	https://ijcrt.org/papers/IJCRT2105369.pdf	YES
11	" Effect of Capping Agents on Structural, Morphological and Optical Properties of CdS Nanocrystalline Films",	Gokul Jaiswal, **Dipali Soren** and Sandhya Pillai	Electronics & Telecommunication Engg.	International Journal of Creative Research Thoughts (IJCRT)	May 2021	ISSN : 2320 – 2882	https://www.ijcrt.org/	https://ijcrt.org/papers/IJCRT2105369.pdf	YES
12	Effect of Capping Agents on Structural, Morphological and Optical Properties of CdS Nanocrystalline Films",	Gokul Jaiswal, Dipali Soren and **Sandhya Pillai**	Electronics & Telecommunication Engg.	International Journal of Creative Research Thoughts (IJCRT)	May 2021	ISSN : 2320 – 2882	https://www.ijcrt.org/	https://ijcrt.org/papers/IJCRT2105369.pdf	YES

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					2020				
1	Numerical Solution of Longitudianal Perturbation fluid and partical velocity on a	Dr Dilip Dash	Applied Mathematics	Journal of Emerging Technologies and Inovative	2020	2349-5162	www.jetir.org	https://www.jetir.org/papers/JETIR2009407	UGC
2	FINITE VOLUME FRACTION EFFECT ON TRANSVERSE VELOCITY IN THE INCOMPRESSIBLE DUSTY	Dr Dilip Dash	Applied Mathematics	Journal of Xi an University of Architecture & Technology	2020	1006-7930	https://xajzkjdx.cn/	https://drive.google.com/file/d/1kxlqiwgGtpp9F81j9qEphpEzCQvghn-e/view	Yes (SCOPUS)
3	Study and Velocity of Temperature considering incompressible dusty fluid. Volume XII, Issue III,	Dr Dilip Dash	Applied Mathematics	Journal of Xi an University of Architecture & Technology	2020	1006-7930	https://xajzkjdx.cn/	https://drive.google.com/file/d/1Fd4W37UG1b_2f1doTVp_bFC0q2SkairH/view	Yes (SCOPUS)
4	A Hybrid Time Series Forecasting Method Based on Supervised Machine Learning Program	G.P. Khuntia, **R. Dash**, S.C. Swain, Prashant Bawaney	Electrical Engineering	Advances in Data Science and Management. Lecture Notes on	2020	volume 37	https://link.springer.com/	https://link.springer.com/chapter/10.1007/978-981-15-0978-0_8	SPRINGER
5	A Hybrid Time Series Forecasting Method Based on Supervised Machine Learning Program	G.P. Khuntia, R. Dash, S.C. Swain, **Prashant Bawaney**	Electrical Engineering	Advances in Data Science and Management. Lecture Notes on	2020	volume 37	https://link.springer.com/	https://link.springer.com/chapter/10.1007/978-981-15-0978-0_8	SPRINGER
6	Analysis of Synthesis Techniques and Properties of II-VI Semiconducting Compounds: A Review"	**Gokul Jaiswal** and Dipali Soren	Electronics & Telecommunication Engg.	International Journal for Research in Applied Science	December 2020	ISSN : 2321 – 9653	https://www.ijraset.com/	https://doi.org/10.22214/ijraset.2020.32479	Yes (SCOPUS)
7	Analysis of Synthesis Techniques and Properties of II-VI Semiconducting Compounds: A Review"	Gokul Jaiswal and **Dipali Soren**	Electronics & Telecommunication Engg.	International Journal for Research in Applied Science	December 2020	ISSN : 2321 – 9653	https://www.ijraset.com/	https://doi.org/10.22214/ijraset.2020.32479	Yes (SCOPUS)
					2019				
1	SPV Grid Interconnection with Current Controller Techniques	R. Paul, A. K. Giri, R. Dash, A. Dewangan, S. Chandra Swain	Electrical Engineering	Innovations in Power and Advanced Computing	2019	doi: 10.1109/i-PACT44901.2019.8960108	https://ieeexplore.ieee.org/	https://ieeexplore.ieee.org/document/8960108	IEEE
2	SPV Grid Interconnection with Current Controller Techniques	R. Paul, A. K. Giri, **R. Dash**, A. Dewangan, S. Chandra Swain	Electrical Engineering	Innovations in Power and Advanced Computing	2019	doi: 10.1109/i-PACT44901.2019.8960108	https://ieeexplore.ieee.org/	https://ieeexplore.ieee.org/document/8960108	IEEE
3	SPV Grid Interconnection with Current Controller Techniques	R. Paul, A. K. Giri, R. Dash, **A. Dewangan**, S. Chandra Swain	Electrical Engineering	Innovations in Power and Advanced Computing	2019	doi: 10.1109/i-PACT44901.2019.8960108	https://ieeexplore.ieee.org/	https://ieeexplore.ieee.org/document/8960108	IEEE
4	Experimental Investigation to Examine the Effect of Shape and Size of Dimples at Suction	Singh, Diksha, **Gajghat, R.H.**, Manik, M.K.	Mechanical	International Journal of Scientific & Technology	Dec. 2019	22778616 (E)	https://www.ijstr.org/	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjW6trK46j9AhWD6nMBH	Scopus
5	Experimental Investigation to Examine the Effect of Shape and Size of Dimples at Suction	Singh, Diksha, Gajghat, R.H., **Manik, M.K.**	Mechanical	International Journal of Scientific & Technology	Dec. 2019	22778616 (E)	https://www.ijstr.org/	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjW6trK46j9AhWD6nMBH	Scopus
6	Mechanical Properties of Epoxy Resin Matrix Composites Reinforced with Jute Fiber, Coconut	**Manik, M.K.**, Gajghat, R.H. & Joseph, Anooj	Mechanical	International Journal of Engineering and Advanced	10/1/2019	22498958 (E)	https://www.ijeat.org/	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiR6pjU5	Scopus
7	Mechanical Properties of Epoxy Resin Matrix Composites Reinforced with Jute Fiber, Coconut	Manik, M.K., **Gajghat, R.H.** & Joseph, Anooj	Mechanical	International Journal of Engineering and Advanced	10/1/2019	22498958 (E)	https://www.ijeat.org/	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiR6pjU5	Scopus
8	Mechanical Properties of Epoxy Resin Matrix Composites Reinforced with Jute Fiber, Coconut	Manik, M.K., Gajghat, R.H. & **Joseph, Anooj**	Mechanical	International Journal of Engineering and Advanced	10/1/2019	22498958 (E)	https://www.ijeat.org/	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiR6pjU5	Scopus
9	Development of a Model for Predicting the Performance of Engineering Students in	**Gajghat, R.H.**, Handa, C.C. & Himte, R.L.	Mechanical	International Journal of Scientific & Technology	7/1/2019	22778616 (E)	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi2yceS5	Scopus

10	A New Model of M-secure Image Via Quantization	Vijay Bhandari, Sitendra Tamrakar, Piyush Shukla,	CSE	Journal Data, Engineering and Applications: Volume 2 ,321-	2019	(PRINT) 978-981-13-6350-4	https://link.springer.com/chapter/10.1007/978-981-13-6351-1_26	https://link.springer.com/chapter/10.1007/978-981-13-6351-1_26	UGC CARE , (SCOPUS) YES
11	Interval valued multi criteria decision making methods for the selection of flexible manufacturing	Manoj Mathewa* and Joji Thomasb	mech	International Journal of Data and Network Science	2019	Print ISSN: 2561-8148	https://growingscience.com/ijds/ijds.html	https://www.researchgate.net/publication/333397158_Interval_valued_multi_criteria_decision_making_metho	SCOPUS
12	Experimental Investigation To Examine The Effect Of Shape And Size Of Dimples At Suction Surface Of	Diksha Singh, Radheshyam H. Gajghat, Mrinal Kanti Manik	mech	INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY	VOLUME 8, ISSUE 12, DECEMBER 2019	ISSN 2277-8616		https://www.researchgate.net/profile/Radheshyam-Gajghat-2/publication/350175046_E	SCOPUS
13	Experimental Investigation to Examine the Effect of Shape and Size of Dimples at Suction	**Singh, Diksha**, Gajghat, R.H., Manik, M.K.	Mechanical	International Journal of Scientific & Technology	Dec. 2019	22778616 (E)	https://www.ijstr.org/	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjW6trK46j9AhWD6nMBH	Scopus
14	Safeguarding Privacy of Data in Cloud Environment using Advanced RTPP	Revati Raman Dewangan, Sunita Soni	CSE	International Journal of Management, Technology And	2019 Page No: 967-969,	ISSN NO : 2249-7455	https://www.ijamtes.org/	doi.16.10089.IJMTE Spl.2019.V9I3.19.27652	ugc
15	Luminescence Properties of Calcium Aluminate Phosphors	M. Z. Khan, Nameeta Brahme1 , D. P. Bisen1 S. J.	Physics	International Journal of Luminescence and application	Vol9 (1) February, 2019,	ISSN 2277 – 6362	**https://ijlaindia.org/**	**http://ijlaindia.org/wp-content/uploads/2015/07/Volume9/Issue1/277.pdf**	**yes**
16	Photocatalytic Properties of Strontium Aluminate Phosphors: A Revie	Deepika Pal1 , Anil Kumar Choubey2	Physics	International Journal for Research in Applied Science	Volume 7 Issue V, May 2019-	ISSN: 2321-9653;	**http://www.ijraset.com/**	**https://www.ijraset.com/fileserve.php?FID=23140**	**yes**
17	Photocatalytic Properties of GO/CdS/(Cd0.8Zn0.2)S/TiO 2 Binary and Ternary	**Archana Kispotta**, 2Sandhya Pillai, 3Smithy Phili	Nanotechnology	Journal of Emerging Technologies and Innovative	2019 JETIR June 2019, Volume 6, Issue 6	(ISSN-2349-5162)	http://www.jetir.org/	https://www.jetir.org/papers/JETIR1907S90.pdf	YES, UGC
18	Photocatalytic Properties of GO/CdS/(Cd0.8Zn0.2)S/TiO 2 Binary and Ternary	Archana Kispotta, 2**Sandhya Pillai**, 3Smithy Phili	Nanotechnology	Journal of Emerging Technologies and Innovative	2019 JETIR June 2019, Volume 6, Issue 6	(ISSN-2349-5162)	http://www.jetir.org/	https://www.jetir.org/papers/JETIR1907S90.pdf	YES
19	Photocatalytic Properties of GO/CdS/(Cd0.8Zn0.2)S/TiO 2 Binary and Ternary	Archana Kispotta, 2Sandhya Pillai, 3**Smithy Philip**	Nanotechnology	Journal of Emerging Technologies and Innovative	2019 JETIR June 2019, Volume 6, Issue 6	(ISSN-2349-5162)	http://www.jetir.org/	https://www.jetir.org/papers/JETIR1907S90.pdf	YES
20	A comparative study of the effect of solvents on the optical, structural and morphological properties	**Sudha Maurya*1** , Sandhya Pillai	Nanotechnology	NANOSYSTEMS: PHYSICS, CHEMISTRY, MATHEMATICS,	2019, 10 (6), P. 711–719	, ISSN 2277 – 6362	http://nanojournal.ifmo.ru/	**http://nanojournal.ifmo.ru/en/wp-content/uploads/2019/12/NPCM106P711-719.pdf**	**SCOPUS**
21	A comparative study of the effect of solvents on the optical, structural and morphological properties	Sudha Maurya*1 , **Sandhya Pillai**	Nanotechnology	NANOSYSTEMS: PHYSICS, CHEMISTRY, MATHEMATICS,	2019, 10 (6), P. 711–719	, ISSN 2277 – 6362	http://nanojournal.ifmo.ru/	**http://nanojournal.ifmo.ru/en/wp-content/uploads/2019/12/NPCM106P711-719.pdf**	**SCOPUS**

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					2018				
1	'Studies on the effect of various mineral acids on the lignin precipitated from soda liquor of Ipomoea Carnea'	**Preeti Nand Kumar,** Sumita Nair;(2018)	APPLIED CHEMISTRY	International Journal of Management, technology, and Engineering Sciences, ISSN : 2249-7455	2018	ISSN : 2249-7455	https://www.ijamtes.org/	https://www.ijamtes.org/gallery/226%20conf%20chem.pdf	yes UGC
2	A Study of Performance of HEV Run By Hybrid Power Sources by using Supercapacitor Bank, Ultrabattery And Fuel Cell	**Bawaney,** DR . Nagendra Tripathi, Shailendra Verma, Nirbhay K Singh	Electrical Engineering	International Journal of Management, Technology And Engineering	2018	2249-7455	www.ijamtes.org	https://www.ijamtes.org/gallery/273-nov.pdf	yes
3	A Review on Tri-Directional Functionally Graded Beam with Various Boundary Condition	**Amit Sarda** Dr. Raghwendra Banchhor	Mechanical Engineering	International Journal of Advanced in Management, Technology and	March 2018	ISSN NO : 2249-7455	https://www.ijamtes.org/	https://www.ijamtes.org/gallery/169%20conf%20mech.pdf	YES
4	Sierpinski Carpet Patterned Rectangular Dielectric Resonator Antenna for X-band	**Dipali Soren,** Rowdra Ghatak, R.K.Mishra and D.R.Poddar	Electronics & Telecommunication Engg.	Journal of Radioelectronics and communications	2018	ISSN: 0735 – 2727.	https://link.springer.com/article/10.3103/S0735272718120051	http://radioelektronika.org/public/journals/16/preview/2018/S0735272718120051_preview.pdf	YES (SCOPUS)
5	An Extensive Review of Webs Caching Techniques to Reduce Cache Pollution	Jitendra Singh Kushwah1 * **Dr. Sitendra Tamrakar**2	CSE	ANUSANDHAN-AISECT University Journal Vol. 06,	2018	-ISSN 2278-4187, E-ISSN 2457-0656	http://aujournals.ipublisher.in/	http://aujournals.ipublisher.in/File_upload/91262_73034396.pdf	Yes
6	Challenges and Techniques available to Predict Preterm Delivery and effectiveness of	TanujaKashyap2 JaspalBagga3**Mina Mishra**	Elex	2018 IJCRT	Volume 6, Issue 1 February 2018 |	ISSN: 2320-2882	https://www.ijcrt.org/	https://www.ijcrt.org/papers/IJCRT1802168.pdf	yes
7	Internet of Things for Healthcare: A Review	Kiran Dewangan Mina Mishra	Elex	International Journal of Advanced in Management,	2018	SSN NO : 2248-7455	https://www.ijaem.net/	https://www.researchgate.net/publication/323855758_Internet_of_Things_for_Healthcare_A_Review	UGC
8	Detection of Finger-Knuckle-Print Images: A Review	Ekta Tamrakar , Mina Mishra	Elex ISSN NO : 2395-5252	International Journal of Advanced in Management,	2018	ISSN NO : 2249-7455	https://www.ijamtes.org/	https://www.ijamtes.org/gallery/76%20conf-etc.pdf	yes
9	Effect of Tb Doping on Structural and Optical Properties of (Cd0.8-Zn0.2)S Films Deposited	Devjyoti Lilhare,**Sandhya Pillai,**Ayush Khare	Elex	**Journal of Electronic Materials**	2018	Online ISSN: 1543-186X ,Print ISSN: 0361-5235	https://www.researchgate.net/journal/Journal-of-Electronic-Materials-1543-186X	http://dx.doi.org/10.1007/s11664-018-6554-5	SPRINGER, SCIE, SCOPUS, UGC CARE

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YEAR: 2022

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Criterion 3

QnM 3.3.1 Publications

Dogo Rangsang Research Journal
ISSN : 2347-7180
UGC Care Group I Journal
Vol-12 Issue-10 No. 02 October 2022

NUMERICAL SOLUTION OF FLUID AND PARTICLE PHASE ON VELOCITY OF HEAT WITH EFFECT OF MAGNETIC FIELD IN INCOMPRESSIBLE DUSTY FLUID

Mr. N.Jagannadham Research Scholar, GIETUniversity, Gunupur -765022, Rayagada, Odisha, India
Dr. B. K. Rath Assistant .prof of Department of Mathematics, GIETUniversity, Gunupur -765022, Rayagada, Odisha
Dr. D. K. Dash Prof and Head of Mathematics Department, CCET, Bhilai, Chhattisgarh, India

Abstract
In this chapter the steady fluid and particle phase of a fluid with SPM past a horizontal flat plate has been considered in a magnetic field. It is assumed that the free stream velocity of the fluid and particle far away from the plate is assumed to be U and particle concentration be $\rho_{p\infty}$. The cloud phase of particle is called pseudo fluid, which enables us to reduce its governing equations similar to Navier Stokes equations. The result obtaining by applying method of the finite difference and the magnitude of the particle reduced significantly. Although some of our numerical solutions agree with some of the available results in the literature review, other results differs because of the effect of the introduced magnetic field
Keywords: Induced Magnetic field, Differential equations, Dusty fluid flow, incompressible fluid,

Introduction

In this chapter the steady laminar flow of a fluid with SPM past a horizontal flat plate has been considered in a magnetic field. It is assumed that the free stream velocity of the fluid and particle far away from the plate is assumed to be U and particle concentration be $\rho_{p\infty}$. In the context of the continuum hypothesis, the solid particle phase is seen as a cloud of particles, each of which is perfectly spherical and has the same radius. We may simplify the governing equations of the cloud phase of particles, which we refer to as pseudo fluid, to the form of Navier Stokes equation. Here this case of a dilute suspension, the stokes law may be obtained from the Boltzmann equations that regulate the particle phase. The particles will not disturb the basic fluid motion but diffuse through the carrier fluid. Here we consider gravitational force as a body force and the buoyancy as a part of the interaction force between the pseudo fluid and fluid phase. For pseudo fluid the total force due to gravitational acceleration is given by $\phi(\rho_{sp} - \rho)$ g and for the gas total force due to gravitational acceleration by ρg.

MATHEMATICAL FORMULATIONS

After introducing the non-dimensional variables, the governing equations are

$$\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}=0 \qquad (1)$$

$$u\frac{\partial \rho_p}{\partial x}+v\frac{\partial \rho_p}{\partial y}=\frac{\varepsilon}{R_c}\frac{\partial^2 \rho_p}{\partial y^2} \qquad (2)$$

$$(1-\phi)\left(u\frac{\partial u}{\partial x}+v\frac{\partial u}{\partial y}\right)=\frac{1}{R_e}\frac{\partial^2 u}{\partial y^2}+f\alpha\rho_p(u_p-u)-\frac{G_r\theta}{R_e^2} \qquad (3)$$

$$\left(u_p\frac{\partial u_p}{\partial x}+v_p\frac{\partial u_p}{\partial y}\right)=\frac{-\varepsilon}{R_e}\frac{\partial^2 u_p}{\partial y^2}+f(u-u_p)+\frac{1}{F_r}-\frac{G_r\theta}{\alpha\rho_{sp}R_e^2} \qquad (4)$$

$$\left(u_p\frac{\partial v_p}{\partial x}+v_p\frac{\partial v_p}{\partial y}\right)=\frac{-\varepsilon}{R_e}\frac{\partial^2 v_p}{\partial y^2}+f(v-v_p) \qquad (5)$$

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ORIGINAL RESEARCH PAPER

Engineering

GREEN CHEMISTRY IN PULP AND PAPER TECHNOLOGY

KEY WORDS: *Sustainability, Green chemistry, Pulping, Bleaching*

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ABSTRACT

Pulp and paper industry is considered to be energy intensive and polluting sectors. This sector employs conventional technologies which are highly intensive in terms of consumption of raw material, chemicals, energy and water which thereby generates higher levels of effluents. Green chemistry is an important tool in order to modify an existing process or to develop new processes with a sustainability approach. Present paper shows the new technologies used in paper and pulp industries. Green chemistry helps to reduce toxic chemicals released into the environment. It also develops nontoxic alternatives to chemicals currently which are in use. A brief idea on how different pulping and bleaching processes takes place in paper making is discussed in this paper. The fundamentals of Green Chemistry including its relationship with sustainability are highlighted.

1. INTRODUCTION:

In the last decade, various technical developments have taken place in pulping, bleaching and chemical recovery technology. Various developments have made it possible to reduce the effluents and airborne emissions. Thus there has been progress towards minimum impact mills in the pulp and paper industry. Minimum impact mill is a manufacturing concept which mainly focuses on environmental management systems, compliances with environmental laws and regulations and manufacturing technologies

Green chemistry, is also known as sustainable chemistry, is a new field that encourages the design and development of chemicals using principles that minimize the use and generation of toxic chemicals. Paul Anastas coined the term "green chemistry." Sustainability of pulp and paper industry is on trend due to the government regulations and increased awareness is developed by various environmental organisations. Sustainable pulps and paper manufacturing requires a comprehensive view of the manufacturing process

An important tool to modify the existing process is Green chemistry. It is becoming one of the new processes with a sustainability approach. It essentially enunciates the ideal principles of sustainable chemistry with basic mannerism to minimise the environmental impact of a given process.

In Green chemistry alternative to chemical development is offered that has the potential to reduce the number of new toxic chemicals released into the environment and also to develop nontoxic alternatives to chemicals currently in use. Central Pollution control Board (CPCB) identified Pulp and paper industry as one of the most polluting industries; it consumes a major quantity of water and heavy chemicals and in turn produces large volumes of effluent. Pulp and paper sector has taken a few initiatives for pollution control, but then also it is far behind the global scene, particularly the small medium industries. It is because of the diversity of the Indian pulp and paper industry with wide range of production capacities and raw materials.

During the last decade, there have been new technical developments in pulping, bleaching and chemical recovery technology. These developments have made it possible to further reduce loads in effluents and flying emissions. Thus, there has been a strong progress towards lowest impact mills in the pulp and paper industry. The minimum-impact mill is a universal manufacturing concept that encompasses environmental management systems, compliance with environmental laws and regulations and manufacturing technologies.

Green chemistry, is a philosophy of chemical research and engineering that encourages the design of products and processes with minimum use and generation of hazardous pollutants. The primary goals of green chemistry is to prevent pollution occuring at its source, rather dealing with pollution, after it has occurred. Other factors in green chemistry which play a major role are utilization of nontoxic chemicals, environmentally benign solvents and renewable materials. The key elements of green chemistry are:

- To design processes which maximize the amount of raw material that ends up in the product
- To use safe, environment-benign ssubstances, including solvents, in day to day whenever possible
- To design energy efficient processes
- To design the chemical products in a way that at the end of their function and does not persist in the environment and break down into innocuous degradation products;
- To develop analytical methodologies to allow for real-time, in-process monitoring and control prior to the formation of hazardous substances;
- Using the ideal waste disposal strategy Green chemistry is looked as a powerful tool by researchers to evaluate the environmental impact of the processes being developed. Many attempts are being made to quantify the greenness of the chemical process but also to factor in other variables, such as, chemical yield, cost of reaction components, safety in handling chemicals, hardware demands, energy profile and ease of product workup and purification.

Pulping Process:

Pulping is the major source of effluents in the manufacturing process of pulp and paper industry. In this process separation of cellulose fibres and removal of impurities takes place. In Pulping process three types of raw materials are generally used i.e. hard wood, Agro residues and Recycled fibre/ waste paper. Qualityof paper depends on the cellulose content in pulp and the fibre length. In Hardwoods higher proportion of cellulose are shorter fibre lengths than softwoods, which are more resinous. Lignin removal is done by treating the wood chips this also improves the fibre quality. Two approaches are employed for pulping viz. chemical pulping and chemi-mechanical pulping.

- **Chemical Pulping -** Kraft Sulphate process: This process is the most important method used for the pulp production. It results in strong, long fibre with low lignin content pulp. Here in this process the wood chips are cooked at temperature of 165- 170°C along with sodium

Recent Advances in Materials and Modern Manufacturing pp 761–770 | Cite as

Influence of Fly Ash and Cement with Molasses Addition on Moulding Properties in Silica Sand: A Comparison

K. CH. Appa Rao, Praveen Kumar Bannaravuri, Anil Kumar Birru, Pulivarti Srinivasa Rao, Gadudasu Babu Rao & D. Arulkirubakaran

Conference paper | First Online: 27 May 2022

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

In a competitive environment, the firms are much more inclined to enhance the productivity. At the present age, the resources are quite costlier, which ultimately impact the final product. It is one of the challengings ahead of many firms, thus far, to make the bridge, many technologies have been developing. However, the establishment of technologies is made to survive in the market. It is always the best choice when we comprehensively utilize the available resources and utilize the secondary process products, which ultimately enhance the productivity. This research paper recollects the importance of molasses and fly ash, which is known for eco-friendly and relative cheaper substitutes where interdispilaniry was used. An attempt was made to study the moulding properties by using fly ash and cement as ingredients and molasses as binding material. An objective was drawn to find the sensitiveness of fly ash and cement on moulding properties. Interestingly for the said study, an appreciable improvement was observed by using fly ash. Hence, fly ash can be recommended as a substitute for the cement-based applications especially for foundry industries.

Keywords

Silica sand | Molasses | Fly ash | Cement | Compressive strength and Tensile strength

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Advances and Applications in Mathematical Sciences
Volume 21, Issue 9, July 2022, Pages 5281-5290

PREDICTION OF ACADEMIC PERFORMANCE OF ENGINEERING STUDENTS BY ARTIFICIAL NEURAL NETWORK

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2020 Mathematics Subject Classification: 68T07.

Keywords: engineering students, academic performance, influencing factors, university examination, artificial neural network.

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APPLICATION OF ANN TO ASSESS EMPLOYABILITY OF UNDERGRADUATE STUDENTS

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Abstract

In this study, the various employment skills sets of graduate technical students were identified. Stakeholders of campus employment activity i.e. company HR, placed Alumni, senior *T* and *P* Officers and senior Trainers authenticated the selected skill sets. All skills were grouped into four major groups as per their characteristics i.e. Aptitude, Communication,

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Keywords: employment, ANN, skill sets, technical college, engineering students.
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Novel outlook to analyzing a gap between industrial and institutional skills at students in the faculty of engineering and natural sciences

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Abstract---In today's scenario, Information Technology industries are compromising their expectations to fulfil the requirement of fresher candidates due to non-availability of job ready students. Industry invests huge cost to train the recruited manpower and make them ready for the on-job work. In this research paper, the researcher identified engineering graduate students' employability skill sets and validated with the support of data provided by the students' institute. All skills were grouped into four categories on the similarity and characteristics for the research work i.e., Aptitude, Communication, Technical and Personality skills set. Primary data was collected by using pen & paper test and secondary data was collected by using questionnaires method. The analysis of collected samples was carried out by using Software Package of Social Sciences (SPSS10). The researcher compared the expected performance by stakeholders and

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ANALYSIS OF FUNCTIONALLY GRADED LEAF SPRING USING ANSYS 18.1

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ABSTRACT

Functionally graded Materials (or also can say, Functionally Gradient materials) are characterized as an anisotropic material whose physical properties varies continuously as the dimensions varies randomly or strategically, to achieve the desired characteristic. The overall properties of the functionally gradient material are different from the properties of any of the individual parent materials which form it. They can be applied to metals, ceramics and organic composites to generate improved components, they are increasingly being considered in industry for various applications to maximize strengths and integrities of many engineered structures. The processing's of FGM is costly, but it is expected the researches carrying in this field for fabrication and processing of such materials will reduce the cost and makes the materials easily available as well as applicable in wide area of applications.

Material modelling, geometric modelling and finite element modelling is done for the leaf spring using exponentially varying properties and Mori tanaka scheme and then numerical problem is solved using the finite element software ANSYS 18.1.

I. INTRODUCTION

Functionally graded materials are a class of advanced composites formed of two or more constituent phases with a gradual and continuously variable chemical composition, microstructure and material properties. They were initially introduced by a group of Japanese scientists for the purpose of addressing the needs of aggressive environment of thermal shock in the space shuttle in 1984 [1]. Since then, due to FGM' outstanding advantages including a potential reduction of in-plane and transverse stresses through-the-thickness, an improved residual stress distribution, enhanced thermal properties, higher fracture toughness and reduced stress intensity factors, FGMs received much attention in both academic and engineering communities [2,3]. A number of reviews dealing with various aspects of FGMs have been published over the years [2, 4-6].

Theory of elasticity on hollow cylinders

Hollow cylinder is a three-dimensional (3D) structure bounded by two parallel curved surfaces (an inner surface and an outer one), which are respectively formed by the points at a fixed distance from the axis of the cylinder. Hollow cylinders area xisymmetric. To analyse the mechanical behaviours of them, cylindrical coordinate (r, θ, z) is always applied, where r,θ and z denote the radial, circumferential land axial coordinates respectively.

A summary of equations for hollow cylinders is made in this section, and the geometric equations, constitutive equations and equilibrium equations are mainly described. These equations associated with boundary conditions (and initial conditions) make up a complete set of equations of hollow cylinder theories.

II. LITERATURE SURVEY

Numerical analysis has been carried out for large deflection of prismatic cantilever beams for various types of material properties with a transverse load at free end. In this project work, paper of M. Bayat et al. (2011) titled "Analysis of Functionally Graded Rotating Disks with Parabolic Concave Thickness Applying an Exponential Function and the Mori-Tanaka Scheme" is taken as base paper and paper of Dipendra Kumar Roy et al. (2012) titled "Nonlinear Analysis of Leaf Springs of Functionally Graded Materials" is also taken as base paper.

A lot of work has been done in the field of FGM but very few in the field of leaf spring so an analysis describing comparison between different material gradation relation like exponential and Mori Tananka scheme with

YEAR: 2021

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Article Detail

Quantitative Analysis And Analytical Method Validation For Api &Formulated Dosages Of Voglibose By Uv Spectroscopy

Author: PREETI NAND KUMAR, R.N.SHUKLA

Abstract: An alpha-glucosidase inhibitor Voglibose is used for lowering blood glucose levels in people with diabetes A very straight forward, quick, responsive and accurate UV- Spectrophotometric method of analysis have been developed for assessment of Voglibose in pharmaceutical formulation. Since Voglibose only absorbs UV in the low wavelength area, it cannot be identify with high sensitivity. Voglibose has shown successful results for various analytical instruments only in the permutation of Taurine and Sodium periodate. The API was derivatives using Taurine and Sodium periodate in water and methanol. Drug exhibited distinct ?max in methanol at 281nm. Linearity was observed in the concentration range 10-80 µg/ml. The method was validated by recovery studies. The methods used are inexpensive and sensitive for the inference of Voglibose in bulk drug and tablet dosage forms.

Keyword: Anti diabetic agent, UV- Spectrophotometry, Voglibose, Glucosidase, Quantitative analysis,

DOI: https://doi.org/10.31838/ijpr/2021.13.02.238

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Linguistic Information for Decision-Making Using SVM

Ritesh Dash, Dillip Ku. Dash, and Radhe Shyam Panda

Abstract Extracting parameters by using linguistic variable which is capable of modelling an electrical signal for power system analysis on the different fault condition has been presented in this paper. Different pattern selection, grammar formulation and representing the signal parameter in terms of linguistic variable are the primitive work carried out in this sponsored research. Half cycle signal data from the fault location has been identified as the researchable area. Using discrete wavelet transformation, the parameters were extracted from the original signal, and by using linguistic variable with the help of machine learning, the classification for the different types of fault has been investigated in detail with MATLAB/Simulink software and Python. The proposed work in this research paper has been tested with different types of fault data for checking the robustness of the controller and its logic.

Keywords SVM · Linguistic variables · Gradient descent

1 Introduction

Electrical power system is highly scattered and nonlinear, and therefore, fault in the transmission line is an usual issue. Out of the different types of electrical transmission line fault, the most common type of fault is line to ground fault, and the most severe type of fault is dead short circuit. Proper identification of electrical fault and its isolation from grid safety point of view is a very critical task [1]. All these mentioned issues can be critically addressed by installing a proper relay which could prevent these problems and lead to minimal amount of loss in the transmission line. In these days, microprocessor-based relays were also used in transmission

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Classification of crop based on macronutrients and weather data using machine learning techniques

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Keywords:
Crop
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Decision tree
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ABSTRACT

Food production in any country depends primarily on the type of soil and the weather condition. Out of the different crop production types in this research, three major crops have been considered, such as rice, wheat, and sugarcane. The crop growth generally depends on the macronutrients and micronutrient content of the soil, which is again a parametric representation of different climatic conditions such as rain, humidity, temperature, sunlight, and pH content of the soil. This research focused on establishing and interrelating the micronutrients and the weather parameters and classifying the type of crop based on the micronutrients using a support vector machine and decision tree algorithm. Different types of tools, such as curve fitting and data analysis using Python-3.9.0, have been used for prediction purposes.

1. Introduction

Predicting the type of crop for a particular area is a very complex and challenging task as it is influenced by several parameters starting from the type of soil and climatic parameters. Again, the crop also depends on the type of method used by the farmers from field to field, so predicting the Crop type's performance from its parametric point of view is a very critical task. With the increasing population, there is a considerable demand for crops throughout the globe; hence, farmers need to be aware of the type of crop that can be treatable for their geographical location and soil type. This is required to waive the economic pressure on the farmers. Therefore, it is essential to provide accurate, timely-based information based on the climatic parameters and soil type to the farmers, helping them make the best decision for their soil, leading to greater profitability and productivity [2]. Several research has been carried out worldwide to increase the crop prediction system by using several algorithms [1].

Global attempts have been made to calculate the interrelationship between pesticides and their uses; from the result, it is found that there is a negative correlation between the two items. The literature survey also found that data mining can be used along with the pest control's agricultural data, which automatically optimizes the pesticides and their uses in crop production. K means clustering has also been used along with the data mining concept for predicting the crop by using the pollution content present in the environment; however, it is not so useful for predicting the crop [3]. The literature has also reported that data mining techniques were also used to study the soil characteristics, and thereby possible weather scenarios were also analyzed in predicting the type of crop. Apart from this, several studies have also been carried out using communication Technologies to predict crops' performance using the Remote Sensing technique or image processing techniques.

The present research work data for Chhattisgarh state was collected from different sources and compiled along with the state's soil type for predicting different types of crop such as rice, wheat, and sugarcane using micronutrients along with weather data as discussed above. Last ten years, data were collected for analyzing the pattern of the crop on the different conditions.

Selecting a particular algorithm is the most critical task. One has to test the data in terms of statistical analysis SPSS, and *t*-test, chi-square test. The preliminary testing would gauge all the data sets, and if possible, the mapping would be applying for successful classification for the data and applying a label to that data set. The classifier prediction most often depends on prediction accuracies like the percent of correct prediction and the false prediction of the total number of prediction data sets. Simultaneously, classification either a split training data set containing a training data set consisting of incredibly exclusive and equal-sized data set. Hence average error present in the classifier technique.

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SIMULATION AND ANALYSIS OF SPEED CONTROL OF ELECTRIC VEHICLE IN MATLAB/SIMULINK

Abhimanyu Mandal[1], Akash Dewangan [2], Shashank Tiwari [3]

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Abstract- *Electric vehicles are a viable solution for lowering greenhouse gas emissions. Electric vehicles not only reduce fossil fuel dependency, but they also minimise ozone damaging compounds and support large-scale renewable deployment. Despite extensive research on the qualities and qualities of electric vehicles, as well as the nature of their charging infrastructure, electric car manufacturing and network modelling continue to evolve and be constrained. The study addresses the various modelling approaches used in studies of the market penetration rate of Electric Vehicles, Hybrid Electric Vehicles, Plug-in-Hybrid Electric Vehicles, and Battery Electric Vehicles.The study is unique in that it addresses crucial hurdles and insufficient charging facilities for a growing country like India. When renewable energy sources are unavailable, the development of the innovative Vehicle-to-Grid concept has provided an additional power source. We conclude that considering the unique characteristics of electric vehicles is critical in their development.*

Key Words: Electric vehicle (EV), Battery electric vehicle (BEV), Hybrid electric vehicle (HEV), Battery

1. INTRODUCTION

Electric Vehicles (EVs) are becoming a promising conduit for improving air quality, energy security, and economic opportunity in India, thanks to the tremendous growth of the automobile sector. The Indian government recognises the need to investigate sustainable mobility options in order to reduce reliance on imported energy sources, reduce greenhouse gas emissions, and minimise the negative effects of transportation. Carbon dioxide emissions can be lowered by implementing preventative actions to avoid catastrophic climate change, which poses a threat to the planet's biodiversity. Major efforts have been made to reduce the use of fossil fuels in power generation, transportation propulsion, energy consumption, and carbon sequestration. Electric vehicles (EVs) could be a viable option for reducing carbon dioxide emissions. Though the use of EVs has begun, people are still depending upon fossil fuel powered vehicles. However, the EVs are facing challenges on life cycle When compared to typical fossil-fueled vehicles, the LCA, charging, and driving range are all superior. Electric vehicle manufacture emits 59 percent more CO2 than conventional vehicle manufacture. On a tank-to-wheel basis, the ICEV emits 120 g/km of CO2, however this rises to 170–180 g/km when viewed through the lens of the LCA. While electric vehicles emit no CO2 from the point of origin to the point of use, they do emit CO2 from the point of use to the point of use. The average CO2 is estimated to be measured across a vehicle's life cycle rather than over a single vehicle. The total CO2 emissions from a vehicle during its entire life cycle vary substantially depending on the power source used and how the vehicle is driven. Due to harmful emissions from the transportation sector and investments by various OEMs, there is concern about the growth of more and lower-cost EVs in the future. Several variables, including technology advancements, lower car costs, government policy support, vehicle purchasing incentives, parking benefits, and enough public charging infrastructure, may contribute to the proliferation of electric vehicles in India. Because electric vehicles are produced in such small quantities, their overall market share in India is insignificant. Electric vehicles (EVs) can be two-wheelers like electric bicycles and scooters, three-wheelers like E-rickshaws, or four-wheelers like electric cars. The Reva Electric Car, India's first electric car manufacturer, launched its car in the early 2000s with the goal of producing inexpensive cars using modern technology. Mahindra Electric Mobility Ltd, India's lone BEV producer, is the market leader. Toyota Kirloskar Motor Pvt. Limited, BMW AG, Volvo Car Corporation, and Honda Motors Co. Ltd. are other significant HEV manufacturers with operations in India. The Mahindra e2oPlus, Mahindra e-Verito, Mahindra e-KUV 100, Eddy Cur- rent Controls Love Bird, Atom Motors Stellar, and others were among the other models. The range type of these parameters is then used to compare them to one another. The effect of different charging methodologies for electric vehicles on the national grid, as well as storage utilisation model-based non-linear observers for predicting the torque of permanent magnet synchronous motors in hybrid electric vehicles. The maximum transmissible torque approach is determined in order to improve the torque control framework's antiskid execution and the stability of electric vehicles. in an electric vehicle's Li-ion battery management Issues such as battery cell voltage, battery state estimation (battery SOC, SOH, DOD, and SOF), and battery life estimation equalization and uniformity and fault analysis of the battery can provide motivation for the research and

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SIMULATION AND ANALYSIS OF SPEED CONTROL OF ELECTRIC VEHICLE IN MATLAB/SIMULINK

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Key Words: Electric vehicle (EV), Battery electric vehicle (BEV), Hybrid electric vehicle (HEV), Battery

1. INTRODUCTION

Electric Vehicles (EVs) are becoming a promising conduit for improving air quality, energy security, and economic opportunity in India, thanks to the tremendous growth of the automobile sector. The Indian government recognises the need to investigate sustainable mobility options in order to reduce reliance on imported energy sources, reduce greenhouse gas emissions, and minimise the negative effects of transportation. Carbon dioxide emissions can be lowered by implementing preventative actions to avoid catastrophic climate change, which poses a threat to the planet's biodiversity. Major efforts have been made to reduce the use of fossil fuels in power generation, transportation propulsion, energy consumption, and carbon sequestration. Electric vehicles (EVs) could be a viable option for reducing carbon dioxide emissions. Though the use of EVs has begun, people are still depending upon fossil fuel powered vehicles. However, the EVs are facing challenges on life cycle When compared to typical fossil-fueled vehicles, the LCA, charging, and driving range are all superior. Electric vehicle manufacture emits 59 percent more CO2 than conventional vehicle manufacture. On a tank-to-wheel basis, the ICEV emits 120 g/km of CO2, however this rises to 170–180 g/km when viewed through the lens of the LCA. While electric vehicles emit no CO2 from the point of origin to the point of use, they do emit CO2 from the point of use to the point of use. The average CO2 is estimated to be measured across a vehicle's life cycle rather than over a single vehicle. The total CO2 emissions from a vehicle during its entire life cycle vary substantially depending on the power source used and how the vehicle is driven. Due to harmful emissions from the transportation sector and investments by various OEMs, there is concern about the growth of more and lower-cost EVs in the future. Several variables, including technology advancements, lower car costs, government policy support, vehicle purchasing incentives, parking benefits, and enough public charging infrastructure, may contribute to the proliferation of electric vehicles in India. Because electric vehicles are produced in such small quantities, their overall market share in India is insignificant. Electric vehicles (EVs) can be two-wheelers like electric bicycles and scooters, three-wheelers like E-rickshaws, or four-wheelers like electric cars. The Reva Electric Car, India's first electric car manufacturer, launched its car in the early 2000s with the goal of producing inexpensive cars using modern technology. Mahindra Electric Mobility Ltd, India's lone BEV producer, is the market leader. Toyota Kirloskar Motor Pvt. Limited, BMW AG, Volvo Car Corporation, and Honda Motors Co. Ltd. are other significant HEV manufacturers with operations in India. The Mahindra e2oPlus, Mahindra e-Verito, Mahindra e-KUV 100, Eddy Cur- rent Controls Love Bird, Atom Motors Stellar, and others were among the other models. The range type of these parameters is then used to compare them to one another. The effect of different charging methodologies for electric vehicles on the national grid, as well as storage utilisation model-based non-linear observers for predicting the torque of permanent magnet synchronous motors in hybrid electric vehicles. The maximum transmissible torque approach is determined in order to improve the torque control framework's antiskid execution and the stability of electric vehicles. in an electric vehicle's Li-ion battery management Issues such as battery cell voltage, battery state estimation (battery SOC, SOH, DOD, and SOF), and battery life estimation equalization and uniformity and fault analysis of the battery can provide motivation for the research and

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SIMULATION AND ANALYSIS OF SPEED CONTROL OF ELECTRIC VEHICLE IN MATLAB/SIMULINK

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Abstract- *Electric vehicles are a viable solution for lowering greenhouse gas emissions. Electric vehicles not only reduce fossil fuel dependency, but they also minimise ozone damaging compounds and support large-scale renewable deployment. Despite extensive research on the qualities and qualities of electric vehicles, as well as the nature of their charging infrastructure, electric car manufacturing and network modelling continue to evolve and be constrained. The study addresses the various modelling approaches used in studies of the market penetration rate of Electric Vehicles, Hybrid Electric Vehicles, Plug-in-Hybrid Electric Vehicles, and Battery Electric Vehicles.The study is unique in that it addresses crucial hurdles and insufficient charging facilities for a growing country like India. When renewable energy sources are unavailable, the development of the innovative Vehicle-to-Grid concept has provided an additional power source. We conclude that considering the unique characteristics of electric vehicles is critical in their development.*

Key Words: Electric vehicle (EV), Battery electric vehicle (BEV), Hybrid electric vehicle (HEV), Battery

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Electric Vehicles (EVs) are becoming a promising conduit for improving air quality, energy security, and economic opportunity in India, thanks to the tremendous growth of the automobile sector. The Indian government recognises the need to investigate sustainable mobility options in order to reduce reliance on imported energy sources, reduce greenhouse gas emissions, and minimise the negative effects of transportation. Carbon dioxide emissions can be lowered by implementing preventative actions to avoid catastrophic climate change, which poses a threat to the planet's biodiversity. Major efforts have been made to reduce the use of fossil fuels in power generation, transportation propulsion, energy consumption, and carbon sequestration. Electric vehicles (EVs) could be a viable option for reducing carbon dioxide emissions. Though the use of EVs has begun, people are still depending upon fossil fuel powered vehicles. However, the EVs are facing challenges on life cycle When compared to typical fossil-fueled vehicles, the LCA, charging, and driving range are all superior. Electric vehicle manufacture emits 59 percent more CO2 than conventional vehicle manufacture. On a tank-to-wheel basis, the ICEV emits 120 g/km of CO2, however this rises to 170–180 g/km when viewed through the lens of the LCA. While electric vehicles emit no CO2 from the point of origin to the point of use, they do emit CO2 from the point of use to the point of use. The average CO2 is estimated to be measured across a vehicle's life cycle rather than over a single vehicle. The total CO2 emissions from a vehicle during its entire life cycle vary substantially depending on the power source used and how the vehicle is driven. Due to harmful emissions from the transportation sector and investments by various OEMs, there is concern about the growth of more and lower-cost EVs in the future. Several variables, including technology advancements, lower car costs, government policy support, vehicle purchasing incentives, parking benefits, and enough public charging infrastructure, may contribute to the proliferation of electric vehicles in India. Because electric vehicles are produced in such small quantities, their overall market share in India is insignificant. Electric vehicles (EVs) can be two-wheelers like electric bicycles and scooters, three-wheelers like E-rickshaws, or four-wheelers like electric cars. The Reva Electric Car, India's first electric car manufacturer, launched its car in the early 2000s with the goal of producing inexpensive cars using modern technology. Mahindra Electric Mobility Ltd, India's lone BEV producer, is the market leader. Toyota Kirloskar Motor Pvt. Limited, BMW AG, Volvo Car Corporation, and Honda Motors Co. Ltd. are other significant HEV manufacturers with operations in India. The Mahindra e2oPlus, Mahindra e-Verito, Mahindra e-KUV 100, Eddy Cur- rent Controls Love Bird, Atom Motors Stellar, and others were among the other models. The range type of these parameters is then used to compare them to one another. The effect of different charging methodologies for electric vehicles on the national grid, as well as storage utilisation model-based non-linear observers for predicting the torque of permanent magnet synchronous motors in hybrid electric vehicles. The maximum transmissible torque approach is determined in order to improve the torque control framework's antiskid execution and the stability of electric vehicles. in an electric vehicle's Li-ion battery management Issues such as battery cell voltage, battery state estimation (battery SOC, SOH, DOD, and SOF), and battery life estimation equalization and uniformity and fault analysis of the battery can provide motivation for the research and

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Original Article

Impact on the microstructure and mechanical properties of Al-4.5Cu alloy by the addition of MoS_2

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ABSTRACT

Utilization of aluminium composites is on the rise and has wide applications in aerospace, automobile and marine industries because of their inherent properties. The aluminium composites express high wear and corrosion resistance, high strength to weight ratio, toughness etc. In the present research work, aluminum 4.5 copper alloy reinforced with MoS_2 is fabricated employing stir casting method and their mechanical properties and microstructures were investigated. The percentage addition of reinforcement was made in the range from 0 wt% to 6 wt% in a step of 2 wt%. The results show a significant improvement in the micro-hardness and tensile properties on the addition of MoS_2 particles, up to 4 wt% and beyond 4 wt%, these properties start decreasing. The uniform distribution of particles as well as fine-grain refinement was observed with the addition of reinforcement and thereby the density of the composite improved. The highest value of tensile strength and hardness of composites was noticed at 4 wt% of MoS_2 of aluminium composite and tensile fracture mechanism was analyzed with the scanning electron microscope.

1. Introduction

These days instead of iron, aluminium is a widely used metal in industries like defence, aerospace and automobile, because of its low density, first-rate wear and corrosion resistance, high strength to weight ratio, superior malleability, good thermal conductivity, and good formability. As technology advanced there is a need for an economical, harder, stronger and low weight material in these industries [1]. In recent years there is a shift of research advancement towards the field of composite materials. Many of the researchers made attempted to reinforce monolithic metals/alloys with ceramic phase (composite) to enhance their properties [2].

Multiphase composite material is produced by bulk processing, it generally has two phases that matrix phase and other one is reinforcement phase. To have different properties, different materials are combined physically with chemically distinct materials. The reinforcement phase elements such as SiC, Al_2O_3, SiO_2, B_4C, AlN, TiC etc., act as load-bearing elements in the composites and improve the bulk properties of composites [3]. These aluminium metal reinforced with a ceramic called aluminium metal matrix composites (AMMCs) have great potential in the engineering and non-engineering fields [4]. When these composites are compared with the non-reinforced alloy, AMMCs show highly enhanced properties in terms of strength, stiffness, corrosion, wear resistance, thermal stability and also, they can be altered to an explicit requirement [5].

AMMCs have wide range applications especially in the transport sector because of reduced noise and fuel consumption than any other materials [6]. Pazhouhanfar and Eghbali [7], have reported that Al6061 alloy reinforced with TiB_2 at 3, 6 and 9 wt% fabricated by a stir casting technique and it was observed that the particles

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Application of the Multiple Regression Analysis for Prediction of Green Compression Strength

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ABSTRACT

The study on green sand moulding to determine green compression strength using regression analysis has been carried out. Coefficient of correlation, determination and multiple determinations were used to establish the relationship existing between the two independent variables molasses and fly ash and green compression strength as the dependent variable. It was found that the coefficient of determination for Y_c- X_1 was 0.52 while the coefficient of correlation was 0.72, coefficient of determination for Y_c- X_2 was 0.42 while the coefficient of correlation was 0.65 and the coefficient of multiple determination was 0.70; these coefficients assisted tremendously in the green compression strength. A mathematical model was developed for the prediction of green compression strength. It was tested and proved to be a valid estimation tool for estimating green compression strength on the foundry shop floor.

Keywords: regression analysis, green sand, green compression strength.

INTRODUCTION

The main aim of foundry industries in the world is to produce good quality castings. Green sand casting is one of the oldest and most widely used casting processes. It is one of the prominent processes where huge products can be manufactured with minimum processing time. The moulding sand may be considered as a mixture of inert granular sand particles, bonding material and other additives. Molasses, a by-product from sugar industries is not only economical and eco-friendly material but can also be used as binder for producing stronger moulds. The strength, permeability and thermal properties of the bonded sands are mostly dependent on the constituents of the moulding sand [1]. The major source of defects in sand casting is due toimproper sand mixture. However, defects can be minimized by the proper control ofmoulding sand properties like green compression strength, permeability, mould hardness and bulk density of sand, which, in turn, are dependent on the input parameters, such as sand grain fineness, amount of binder and moisture, etc. Ample of researchers made an attempt on moulding sand and its properties during 1960's to 1970's around the world. Most of the research work during that period was based on experimental and theoretical approaches.Statistical design of experiment has proved to be an effective tool for studying the complex effects of number of independent variables on response factor. Regression analysis is one among such method. Karunakar and Dutta[2]suggested optimum formulation of the green sand mixture using back propagation artificial neural network and micro genetic algorithm between them micro genetic algorithms meritorious results over artificial neural networks. Jakubski et al.[3] suggested applying neural networks for controlling the quality of bentonite moulding sands. Parappagoudar et al.[4] presented a work on forward and reverse mappings in green sand mould system using neural networks. Theyfound that Genetic algorithm-Neural Network outperforms the back propagation neural networkand that both the neural network approaches are able to carry out the reverse mapping effectively.Delijaicov et al.[5]studied statistical methods based on multiple regression and neural networks and applied toa data set generated by peen forming designed experiments with aluminium alloy plates, aiming to synthesize quantitative models relating the highest displacement of the plate with respective variables of the process. Luke Haung et al.[6] formed multiple regression models to predict surface roughness in turning operation. Chang et al. [7] investigated the properties of green moulding sand and a new model was developed to evaluate the flowability of moulding sand.It was found that the flowability of silica sand is affected by water content, bentonite and sea coal content. Jain[8] made an attempt on effect of grain size variation and moisture content on green compression strength of green sand mould. It was observed that moisture wasincreased,respectively green compression strength also increased whereas further increment led to decrease in green compression strength. FeridunBoyhu[9] studied foundry sand characteristics of soda-activated calcium bentonite. It was observed that, optimization was achieved using the response surface regression methodfor activated calcium bentonite used in foundry sand.Ihom et al.[10] proposed the analysis and prediction of green permeability values in sand moulds using multiple linear regression models. Jun Wang et al. [11] investigated the

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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Effect of Capping Agents on Structural, Morphological and Optical Properties of CdS Nanocrystalline Films

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[1]Student, [2]Professor, [3]Associate Professor
[1, 2, 3] Department of Nanotechnology,
[1, 2, 3]Christian College of Engineering and Technology, Bhilai, India

Abstract: - CdS nanocrystalline films were prepared by chemical bath deposition method (CBD) on glass substrates at 70^0c for 1 hour. Mercaptoethanol, Thioglycerol, and water-soluble PVP have been used as capping agents for the synthesis of these films. The effect of capping agents on the structural, morphological and optical properties of the films was investigated and discussed. The films were characterised by XRD, SEM and UV-VIS absorption spectral studies. XRD studies shows prominent diffraction lines of CdS with maximum orientation towards (111) plane of the cubic phase. Sharp peaks were observed in PVP capped CdS in comparison to Mercaptoethanol and Thioglycerol capped films. Particle sizes calculated from XRD studies were found to be in nano range. Distinctly different morphology is observed in the films capped with Mercaptoethanol, Thioglycerol and PVP in comparison with the bulk films. CdS films show large sized clusters of particles while Mercaptoethanol and PVP capped films show spherical particles forming clusters and a cabbage like layered structure is seen in Thioglycerol capped films.EDX spectra confirms the presence of Cadmium and Sulphur with excess Cadmium. Absorption spectral studies show a blue shift in absorption edge in all the capped films compared to the bulk suggesting quantum confinement effect. The studies suggest that the properties of the nanocrystalline CdS films can be tuned by using different capping agents.

Keywords: **CdS, capping agents Mercaptoethanol, Thioglycerol, PVP.**

I. INTRODUCTION

Nanoscale particles have been a subject of great interest in recent times, in terms of both their fundamental and technological importance [1][2]. Chalcogenide based semiconductor nanoparticles are quite promising materials for application in optoelectronics [3][4][5]. CdS, a binary chalcogenide semiconductor has a band gap of 2.43eV. The various advantages of CdS semiconductors are its size dependent optical properties, tunable band gap, good chemical stability and easy preparation techniques. [6] CdS nanocrystalline thin films have wide applications in piezo electric transducers, laser materials, photovoltaic cells and window materials in hetero-junction solar cells. [7][8]

Although a variety of techniques have been employed for the preparation of these materials like vacuum evaporation, spray pyrolysis, sputtering, molecular beam epitaxy etc [9]. Chemical bath deposition (CBD) method is the simplest and the least expensive.[10] This method requires very economical experimental facility and is highly suitable for large scale preparation, usually in film form. The utility of chemical deposition method in the deposition of metal chalcogenide thin film was reviewed by Mane and Lokhande [11]. The semiconductor nanoparticles agglomerate very rapidly in the absence of capping agents [12] and hence a bonding of the capping agents to these nanoparticles is required to provide chemical passivation and improve the surface state which directly affects the structural and optical properties of these materials. Hence Mercaptoethanol, Thioglycerol and water-soluble PolyVinyl Pyrrolidone (PVP) have been used as capping agents in the present work and methanol has been used to dissolve the capping agents. The present paper reports the effects of these capping agents on the structural and optical properties of CdS nanocrystalline films, not reported earlier. For the characterization of the films, results of XRD, SEM and Absorption spectra are presented and discussed.

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NUMERICAL SOLUTION OF LONGITUDINAL PERTURBATION FLUID AND PARTICLE VELOCITY ON A DUSTY FLUID JET COMPRESSIBLE FLOW PROBLEM CONSIDERING FINITE VOLUME FRACTION

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ABSTRACT

The numerical solution of compressible dusty fluid considering finite volume fraction has been studied. Assuming the velocity and temperature in the jet to differ only slightly from that of the surrounding stream, a perturbation method has been employed to linearize the basic equations. The linearized boundary layer equations have been solved by using double transform technique. Numerical computations have been made to discuss the profiles of velocity of the fluid and particle. It is observed that consideration of finite volume fraction reveals that the magnitude of perturbation velocity of both fluid and particle is reduced significantly.

KEYWORDS: Particulate suspension, Boundary layer characteristics, volume fraction, diffusion. Compressible fluid.

NOMENCLATURE

(u, v) Fluid velocity, (z, r) Denote the distance along and perpendicular to the jet axis, K for thermal conductivity, p_r for Prandtl number, (T,T_p) Temperatures of fluid and particle phase, T_0 for Undisturbed temperature of jet flow, $(\bar{u},\bar{v},\bar{u}_p,\bar{v}_p)$ Non-dimensional velocity components of fluid and particle phase respectively,$(u_1,u_{p_1},v_1,v_{p_1},T_1,T_{p_1},\rho_{p_1})$ First order perturbation quantities, (u_0,u_{p_0}), The uniform velocity at the exit of jet flow, (T_0,T_{p_0}) Temperature at the exit of jet flow, $(\bar{T},\bar{T}_p)$ Dimensionless temperature components of fluid and particle phase, U for Undisturbed jet velocity, α Concentration parameter, (υ,υ_p), Kinematics coefficient of viscosity of fluid and particle phase respectively, (ρ,ρ_p) Density of fluid and particle phase respectively, $\bar{\rho}_p$ Dimensionless density of the particle phase, μ Coefficient of viscosity of fluid, μ_p Coefficient of viscosity of particle phase, C_s Specific heat of the solid particles, C_p Specific heat at constant pressure for the gas, φ volume fraction of dust particles, λ_L The momentum equilibration length, ρ_p density of the particles in the free-stream, ρ_{p_0} Undisturbed particle density in the jet, τ_T thermal equilibration time, τ_m The momentum equilibration time.

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FINITE VOLUME FRACTION EFFECT ON TRANSVERSE VELOCITY IN THE INCOMPRESSIBLE DUSTY FLUID.

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ABSTRACT

The presence of contaminating dust particles in fluids can occur naturally. These problems associated with the flow characteristics and their properties. The effect of finite volume fraction of suspended particulate matter on axially symmetrical jet mixing of incompressible dusty fluid has been considered. The presence of dust particles in a homogeneous fluid makes flow problems quite complicated. The velocity and the temperature are assumed to differ around its steam , A higher order neglecting method is in the differential equation and solved by methods of Hankel's Transformation technique. It shows the magnitude of transverse perturbation fluid velocity reduced continuously.

key word : Dusty fluid, volume fraction, incompressible flow.

INTRODUCTION

In the present paper, we discussed the effect on transverse velocity in dusty incompressible fluid. Here we are using higher order neglecting method has been applied to solve the differential equations. I found the solution of Longitudinal velocity of the fluid and the particle of the dusty fluid with the effect of volume fraction in the incompressible fluid and observed that the effect of volume fraction along with concentration parameter in the dusty incompressible fluid, here it is observed that increase in

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STUDY ON VELOCITY OF TEMPERATURE CONSIDERING INCOMPRESSIBLE DUSTY FLUID.

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ABSTRACT

The velocity of temperature considering incompressible dusty fluid has been studied. The problem is investigated considering the temperature and velocity are differing from surrounding stream and the flow characteristics and properties in fluid mechanics. Taking non dimensionless variable and using perturbation method the non linear differential equation are transferred to linear form for numerical solution. We adopted the laplace transformation technique for solving the differential equation. Result shows that the magnitude of temperature velocity reduce significantly.

Key word and phrase : Dusty Fluid, particulate suspension , boundary layer characteristics , incompressible flow.

INTRODUCTION

The problem of temperature velocity flow of Non Newtonian dusty fluid has been under investigation. The incompressible fluid flow has been studied by different researches such as T.C.Panda , S.K.Mishra & D.K.Dash[1,10] discussed Effect of volume fraction in axi symmetric jet mixing and Modelling Dispersion of SPM in free convection flows in the vicinity of heated horizontal flat plate . The author B.K.Rath, G.K.Behera & D.K.Dash[2] find the solution of Longitudinal velocity of the fluid and the particle of the dusty fluid with the effect of volume fraction in the incompressible fluid. The author B.K.Rath, P.K.Mahapatra & D.K.Dash [3] find the effect of volume fraction along with concentration parameter in the dusty incompressible fluid, here it is observed that increase in concentration parameter of the dust particle reduces the magnitude of fluid velocity. The author E.M.Purcell [7] Obtain the effect of fluid motion on the absorption of molecules by suspended particles. The author T.C.Panda, S.K. Mishra, and K.C. Panda [5,6] discussed flow of suspended particulate matter (SPM) due to time dependent horizontally oscillating plate and suspended particulate matter using two phase flow. The author D.K.Dash & B.K.Rath[4,8,9] discussed the simplification and the effect volume fraction in modeling of boundary layer equation in axisymmetric jet mixing of incompressible flow in cylindrical polar coordinates.

A Hybrid Time Series Forecasting Method Based on Supervised Machine Learning Program

Ganesh Prasad Khuntia, Ritesh Dash, Sarat Chandra Swain and Prashant Bawaney

Abstract Clean and inexhaustible source of energy is the requirement of the entire world with respect to the present scenario. Among the different types of energy sources, wind energy is the cleanest energy and inexhaustible source of energy. In order to ensure the production of clean energy, it is required to forecast the level of wind energy from a day ahead. Forecasting of wind energy not only forecasts the level of wind but also predicts the type of wind energy, density, and other important variables. This paper describes the short-term forecasting based on Machine Learning algorithm. This paper compares the different Machine Learning Algorithm and its behavior in predicting or forecasting the day-ahead data for the wind energy system. Machine learning based on Python is formulated in this paper.

Keywords Wind energy · Python · Forecasting · Training set · Testing set

1 Introduction

Power Plant supported Renewable Energy System has dragged the eye of Power researchers, thanks to its scattered expression within the last decade [1, 2]. Massive-scale growth of those sources has created it to satisfy the rise in demand of power. This growth isn't just for an economic or political reason, however additionally for making an appropriate setting for our new generation wherever power is made from clean sources like solar and wind with zero setting pollutions [3–5]. The government

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Analysis of Synthesis Techniques and Properties of II-VI Semiconducting Compounds: A Review

Gokul Jaiswal[1], Dipali Soren[2]
[1, 2]ETC Department, CCET Bhilai, INDIA

Abstract: *This paper provides a review focusing on synthesis techniques, various structures and the effect of capping agent on the size of semiconductor nanocrystalline materials. These semiconductor nanoparticles have potential applications in light-emitting diodes, small film transistors, solar cells and photoconductive devices. Compared to most bulk materials, these nano particles have unique properties. If the particle size of these semiconductors becomes smaller than the Bohr excitonic radius, quantum size effects occur and subsequently band gap of the material increases. Capping agents have an important role to play in particle size reduction. Keeping this in view, researchers have explored several new substrates and methods of synthesis using different capping agents for these materials. Some recent contributions of authors about new techniques and properties of nano materials and their use in a variety of fields are also discussed.*

Keywords: *Synthesis, capping agent, nanomaterials*

I. INTRODUCTION

Nano crystalline materials have attracted many material researchers due to their enhanced properties when compared to that of bulk materials. They are becoming increasingly interesting for optoelectronics and photonics. The electronic and electrical properties of such materials show a remarkable change as the particle size approaches that of its excitonic Bohr radius and then electrons and holes are subject to the effects of quantum confinement [1, 2] due to their wide range in volume, which has led to the formation of higher regions. Nanoscale semiconductors show exciting electro-optical structures and stimulating behavior [3]. As the size of the nanocrystal decreases, the strength of the initial solid state decreases, following the quality following the performance of the particle-box. This effect of the dependence on the size and emergence of the electronic structure separates from the continuous levels in the valence and conduction bands of the semiconductor effect in bulk is caused by quantum confinement. [4]

Semiconductor nano materials have a wide band gap with Eg = 2.4 to 3.7 eV at 300 K. As Compared to bulk materials and melting point, electronic absorption, gap strength, crystal structure, and other structures properties of these nano particles (CdS, CdSe, ZnS, ZnO, and TiO2-NP) are also affected by size [5 - 7]. These synthetic nano particles can be used in the fields of electronic and photovoltaic devices [8], [9], catalysis, molecular diagnostics and interfacial electron transfer [10]. This detailed review shows some areas, which have not been adequately addressed so far. Various integration routes have been used over the past few years to accommodate these structures. They can be adjusted to customized sizes and structures such as increased durability, surface area, magnetic properties, optical and catalytic properties. This study includes the various techniques for the synthesis, structure and application of these nanomaterials in various fields and the effect of capping agent in size.

II. DIFFERENT METHODS

There are various methods for synthesis of Nanomaterials like Chemical Precipitation method, Hydrothermal method, Sol-gel method, Chemical Bath Deposition (CBD) method, Biosynthesis method. One method for synthesis of Nano Material is chemical co-precipitation method. Nanoparticles were synthesized with different sizes by chemical precipitation method [14]. Another method is hydrothermal method, in which nanoparticles with good crystallinity were prepared by hydrothermal method [15] in micro emulsion composed of polyoxyethylene laurylether/water/cyclohexane/butanol. This method is used to improve the photo-luminescent property of the nanoparticles. Nanocomposites have also been synthesised by sol-gel method, and such prepared nanocomposites show much higher and more stable activity for photoluminescence (PL) properties. Nanocrystals are successfully grown in porous silicon (PS) sol-gel method [16]. The most common procedure for the synthesis of Cadmium sulphide is a chemical bath [17] where Nano Material is deposited on the glass substrate and thus a thin film is prepared. The film size is almost full when the deposition time is more than 90 min.

Although nanomaterials can be produced using a variety of traditional physical and chemical processes, it is now also possible by biological processes. Recent studies show the preparation of nano materials by biological method [18] or green synthesis. In this method, plant extract is used as a stabilizing/ reducing agent with less hazards towards environment, They can be easily scaled up, are stable, economically viable and suitable for large scale production.

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Density functional study on hybrid h-BN/graphene atomic chains

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ABSTRACT

Hybrid graphene and hexagonal boron nitride (C-BN) nanostructure received much research interest due to complementary electronic properties. Graphene is zero band gap semiconductor, while hexagonal boron nitride (h-BN) is a wide band gap semiconductor. Here, we have studied the structural, electronic and mechanical properties of hybrid zigzag graphene atomic chain with boron nitride doped, and zigzag boron nitride atomic chain with carbon pairs doped. Covalent bonds are found between carbon atoms, partially ionic and covalent bonds between boron and nitrogen atoms. BN atomic chain with 6 carbon pairs-ZBNGR transformed into a metal, and GR with 14-carbon pairs-ZGRBN transformed into a semiconductor. In the distribution of density of states; p-orbital electrons are contributing. There is a zero band gap in ZBNGR, and indirect band gap in ZGRBN. Band gap of second hybrid is tuned and becomes metal by the application of strain and external electric field. Breaking energy is found to be higher for first hybrid during compression of a chain. These investigations make hybrid atomic chains significant in device applications.

1. Introduction

In the last recent years, two-dimensional (2D) materials such as graphene [[1,2]], hexagonal boron nitride [3,4], molybdenum disulfide [5,6], have been seen as a great research interest due to mechanical, structural, and electronic properties of their thin layered structures. Graphene has sp2 bonded carbon atoms which arranged in a honeycomb lattice with a zero-band gap semiconductor, because; the lower energy charge carriers behave as mass less Dirac Fermions of conduction π^* bond touches with the valence band at k-point in the Brillouin-zone [7]. Graphene nano-ribbons (GNRs) exhibit different electronic properties by defect, impurity doping [8], adsorption [9], chemical functionalization [10,11], external field [12], geometry [13], and so on. Therefore, graphene provides the methods for applications in many electronic devices, such as negative differential resistance (NDR) [14,15], rectifying behaviors [16,17], single-electron characteristics [18], gas sensors [19], spin filtering [20], field-effect transistors (FETs) [21] etc.

Similar to graphene, boron-nitride (BN) has iso-electronic structure having the same number of electrons between B–N bonds and C–C bonds. As it turns out, boron and nitrogen also form exceptionally strong sp2 bonds, leading to planar BN configurations. Graphene and hexagonal BN share very similar structural characteristics and many physical properties except the large band gap of BN. Recently, monolayer hexagonal boron nitride sheets have been fabricated in experiments [22,23], unlike graphene, hexagonal BN sheet is a wide-gap insulator. However, cutting a monolayer of BN sheet along a different size will form different type of BN nanoribbons similar to graphene nanoribbons (GNRs). The band gap of BNNRs depends on ribbon width and is very important in electronic applications. Thus, it is highly desirable to engineer the band gap of BNNRs. Few methods have been developed to tune the band gap of BNNRs, including chemical decoration [24], hydrogen-termination [25,26], by applying external electric field [27], and so on.

Recently, hybrids of 2D graphene and boron nitride (C-BN) nanostructures, in form of either in-plane hybrids or inter-planar heterolayers, have received much attention, it has confirmed that hybridized

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Photocatalytic properties of persistent luminescent rare earth doped $SrAl_2O_4$ phosphor under solar radiation

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This paper aims to study the photocatalytic properties of strontium aluminate phosphors. The rare earth doped strontium aluminate was synthesized by combustion method. The photocatalytic property was studied by absorption of methyle orange in aqueous solution under solar radiation. Eu:Dy codoped $SrAl_2O_4$ shows better photocatalytic properties than Eu or Dy doped or Eu, Dy, Ho codoped $SrAl_2O_4$. Structural and morphological characterization was done by X-ray diffraction, SEM, EDX techniques.

Keywords: photocatalysis, strontium aluminate, combustion method, persistence luminescence.

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1. Introduction

Today, environmental pollution is major concern, especially resulting from volatile organic compounds like benzene or textile dyes, like Methylene blue, Congo red, etc.; these volatile organic compounds are known to be toxic and carcinogenic. It is required to develop photo-catalysts for the degradation of these toxic materials to reduce air pollution and to develop better wastewater cleaning process. Advanced oxidation is a process which produces reactive oxygen groups to react with different chemicals which in turn help in degradation of these chemicals. Photocatalysis is also a kind of advanced oxidation process to remove organic pollutants from water [1, 2]. When photocatalysts are dispersed in water, they absorb UV or sun light to produce electron-hole pairs which in turn generate free radicals (e.g. hydroxyl radicals OH^- and O^{2-}) that take part in secondary reactions which removes organic pollutants from water [3]. Photocatalysts are semiconductors or insulators such as Al_2O_3 [4], ZnO [5], Fe_2O_3 [6]. TiO_2 has been widely used for decolorizing of organic contaminants, dyes and phenols. The problem with TiO_2 is that it is toxic for living organisms [7, 8] like fish and other aquatic animals, as it can penetrate their skin to produce oxidative stress and impaired liver function. Hence, the search for new environmentally friendly photocatalysts is required that could be easily removed from water. It has been found that long-lasting phosphors show photocatalytic properties [9]. Rare earth doped alkaline earth aluminates are a very important class of luminescent materials due to their higher quantum efficiency and persistent luminescence [10]. They are good host materials and have wide band gaps, thus, they have been suggested for possibile application such as development of white LED'S, gamma ray dosimeter, pressure sensor, stress sensor, environmental radiation dosimetry, luminescent paint, emergency exit lamps, radiation detection [11, 12] etc. There are few papers which report persistent luminescent phosphors prepared by combustion method as photocatalytic materials.

In this paper, we have reported the synthesis of $SrAl_2O_4$ doped with Eu/Dy/Ho by combustion method and their photocatalytic properties.

2. Experimental

The combustion method involves a highly exothermic reaction between an organic fuel and metal nitrates. The reaction is initiated at low temperatures (around 610 °C) and proceeds to completion in a few minutes. The exothermic chemical reaction between the metal nitrates and fuel provides the required heat for synthesis of nano-phosphor. Research grade strontium nitrate $Sr(NO_3)_2$, aluminum nitrate $Al(NO_3)_3 \cdot 9H_2O$, europium oxide Eu_2O_3, dysprosium oxide Dy_2O_3, holmiun oxide Ho_2O_3 were used as the staring materials and urea $CO(NH_2)_2$ was used as a fuel. The Stoichiometric composition to prepare $Sr_{1-x}Al_2O_4{:}Eu_x$ phosphor, the chemical reaction used for the combustion reaction is as follows:

NANOSYSTEMS: PHYSICS, CHEMISTRY, MATHEMATICS, 2020, 11 (5), P. 590–594

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1. Introduction

Today, environmental pollution is major concern, especially resulting from volatile organic compounds like benzene or textile dyes, like Methylene blue, Congo red, etc.; these volatile organic compounds are known to be toxic and carcinogenic. It is required to develop photo-catalysts for the degradation of these toxic materials to reduce air pollution and to develop better wastewater cleaning process. Advanced oxidation is a process which produces reactive oxygen groups to react with different chemicals which in turn help in degradation of these chemicals. Photocatalysis is also a kind of advanced oxidation process to remove organic pollutants from water [1, 2]. When photocatalysts are dispersed in water, they absorb UV or sun light to produce electron-hole pairs which in turn generate free radicals (e.g. hydroxyl radicals OH^- and O^{2-}) that take part in secondary reactions which removes organic pollutants from water [3]. Photocatalysts are semiconductors or insulators such as Al_2O_3 [4], ZnO [5], Fe_2O_3 [6]. TiO_2 has been widely used for decolorizing of organic contaminants, dyes and phenols. The problem with TiO_2 is that it is toxic for living organisms [7, 8] like fish and other aquatic animals, as it can penetrate their skin to produce oxidative stress and impaired liver function. Hence, the search for new environmentally friendly photocatalysts is required that could be easily removed from water. It has been found that long-lasting phosphors show photocatalytic properties [9]. Rare earth doped alkaline earth aluminates are a very important class of luminescent materials due to their higher quantum efficiency and persistent luminescence [10]. They are good host materials and have wide band gaps, thus, they have been suggested for possibile application such as development of white LED'S, gamma ray dosimeter, pressure sensor, stress sensor, environmental radiation dosimetry, luminescent paint, emergency exit lamps, radiation detection [11, 12] etc. There are few papers which report persistent luminescent phosphors prepared by combustion method as photocatalytic materials.

In this paper, we have reported the synthesis of $SrAl_2O_4$ doped with Eu/Dy/Ho by combustion method and their photocatalytic properties.

2. Experimental

The combustion method involves a highly exothermic reaction between an organic fuel and metal nitrates. The reaction is initiated at low temperatures (around 610 °C) and proceeds to completion in a few minutes. The exothermic chemical reaction between the metal nitrates and fuel provides the required heat for synthesis of nano-phosphor. Research grade strontium nitrate $Sr(NO_3)_2$, aluminum nitrate $Al(NO_3)_3 \cdot 9H_2O$, europium oxide Eu_2O_3, dysprosium oxide Dy_2O_3, holmiun oxide Ho_2O_3 were used as the staring materials and urea $CO(NH_2)_2$ was used as a fuel. The Stoichiometric composition to prepare $Sr_{1-x}Al_2O_4{:}Eu_x$ phosphor, the chemical reaction used for the combustion reaction is as follows:

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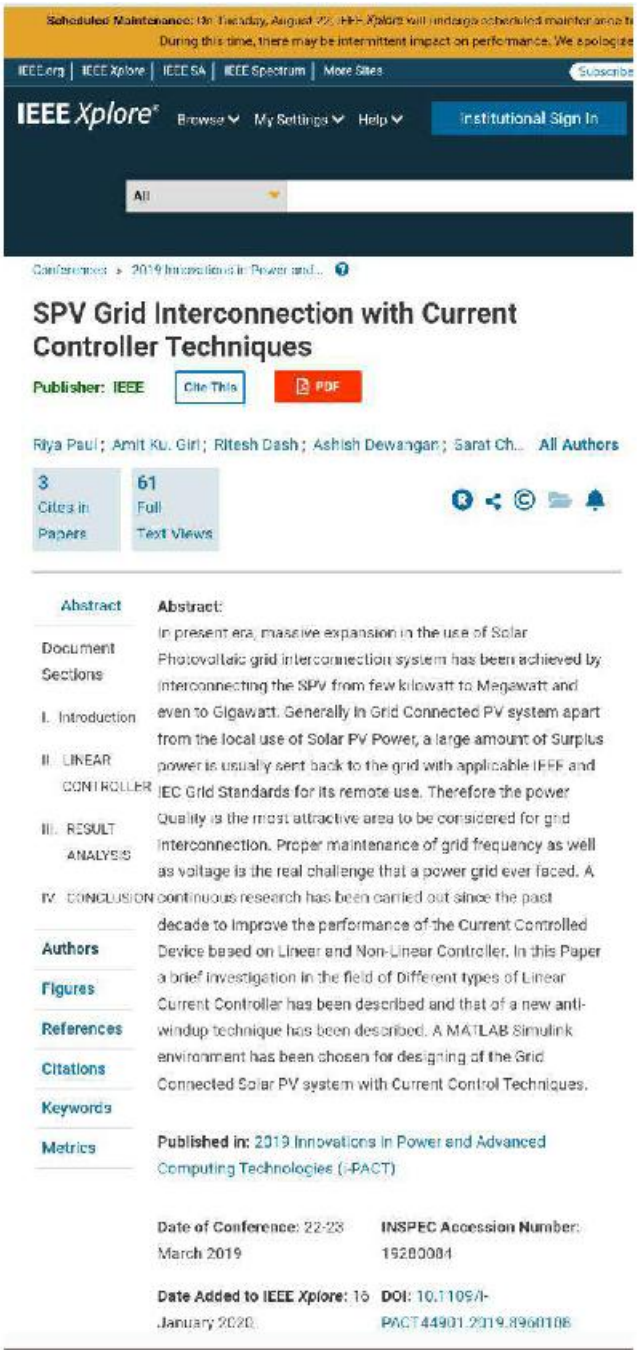

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SPV Grid Interconnection with Current Controller Techniques

Publisher: IEEE | Cite This | PDF

Riya Paul ; Amit Ku. Giri ; Ritesh Dash ; Ashish Dewangan ; Sarat Ch... All Authors

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Abstract
Document Sections
I. Introduction
II. LINEAR CONTROLLER
III. RESULT ANALYSIS
IV. CONCLUSION
Authors
Figures
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Keywords
Metrics

Abstract:
In present era, massive expansion in the use of Solar Photovoltaic grid interconnection system has been achieved by interconnecting the SPV from few kilowatt to Megawatt and even to Gigawatt. Generally in Grid Connected PV system apart from the local use of Solar PV Power, a large amount of Surplus power is usually sent back to the grid with applicable IEEE and IEC Grid Standards for its remote use. Therefore the power Quality is the most attractive area to be considered for grid interconnection. Proper maintenance of grid frequency as well as voltage is the real challenge that a power grid ever faced. A continuous research has been carried out since the past decade to improve the performance of the Current Controlled Device based on Linear and Non-Linear Controller. In this Paper a brief investigation in the field of Different types of Linear Current Controller has been described and that of a new anti-windup technique has been described. A MATLAB Simulink environment has been chosen for designing of the Grid Connected Solar PV system with Current Control Techniques.

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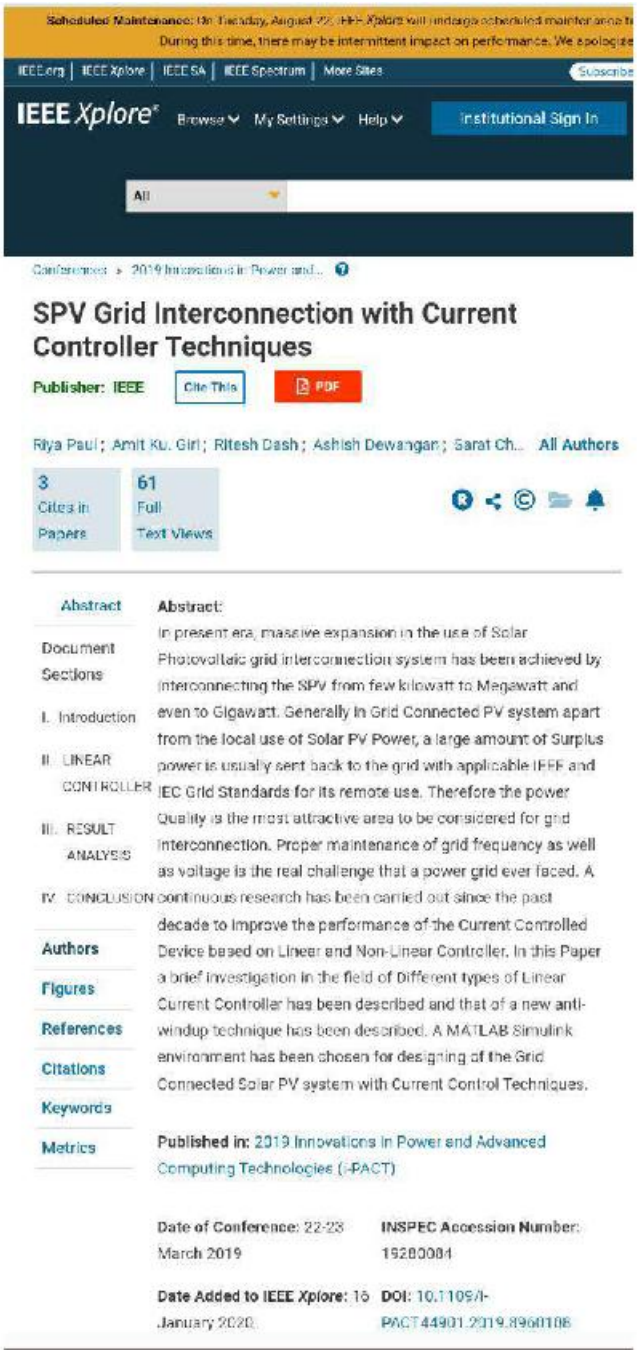

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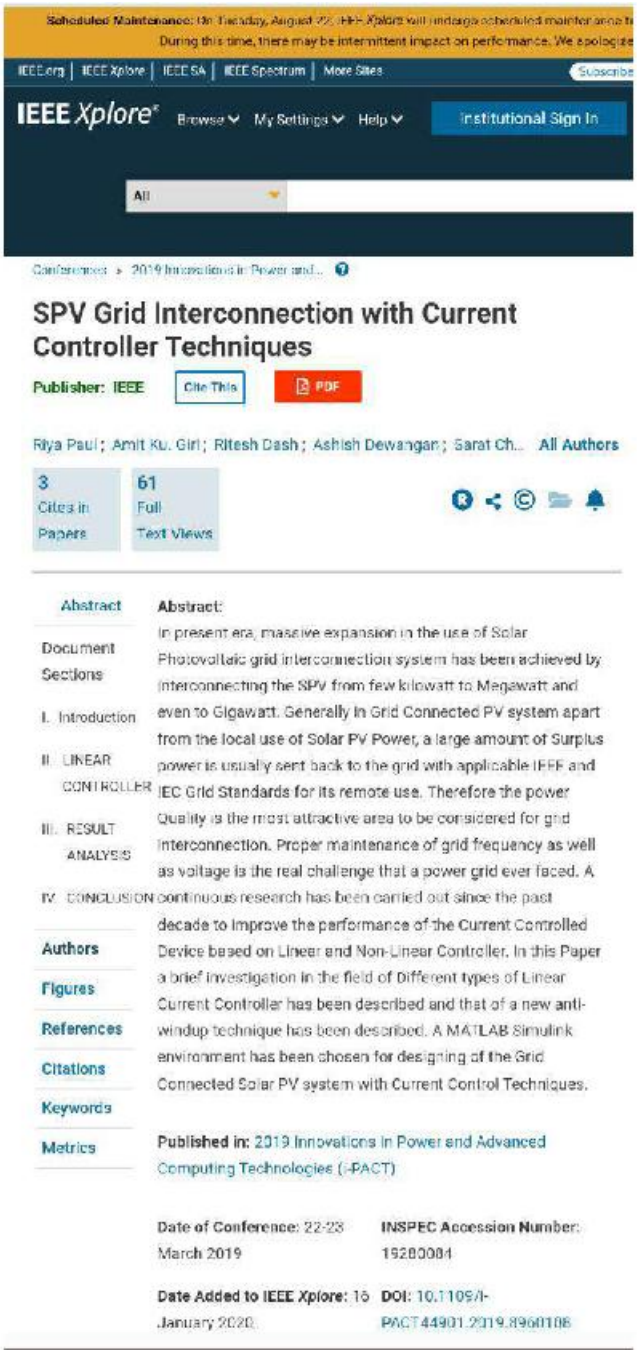

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INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 8, ISSUE 12, DECEMBER 2019 ISSN 2277-8616

Experimental Investigation To Examine The Effect Of Shape And Size Of Dimples At Suction Surface Of Aerofoil

Diksha Singh, Radheshyam H. Gajghat, Mrinal Kanti Manik

Abstract: Aerofoil, the cross-sectional shape of a wing, has a significant role in any aircraft due to its capability of generating adequate lift to hold that aircraft in the air with less drag. The design of the aerofoil with desired aerodynamic characteristics is not an easy till date. Although, at early stages of technical development, it was compromised with the performance due to the random designing while test in a flow section. But as time rolled on to the later phase of the development era, Wright brothers (Orville Wright and Wilbur Wright) came with the cambered section. At present NACA (National Advisory Committee for Aeronautics) has given a proper definition for Aerofoil, which helps us design aerofoil using formula instead of randomizing it, to achieve the optimal performance to some extent. In this work, an experimental investigation was carried out to enhance the performance of an Aerofoil NACA 4311 by surface modification. Initially the aerodynamic performance of three different shapes viz. cambered, flat and symmetrical shaped aerofoil was checked experimentally. Based on this investigation it was concluded that symmetrical aerofoil gave quite better performance than cambered and flat shaped aerofoil. After surface modification by placing dimples of different sizes and shapes at suction surface of symmetrical aerofoil, it was found that the medium semi cylindrical dimples gave better aerodynamic performance as compared to other modifications.

Index Terms: Aerofoil, Lift, Drag, Stall angle, Lift to Drag ratio, Reynolds number.

1. INTRODUCTION

THE thought of birds' flying transformed into technology on the day of 17th December, 1903 when Wright Brothers gave human race new wings and thereafter continuous endeavours is going on this field. Researchers have put in their enormous effort with progress to a great extent but still, there are many more findings to be done to get freedom in the air. Continuous attempts have been made to enhance the performance of lift, speed and aerodynamic efficiency of an aircraft by reducing drag. Aircraft wings are the lifting surfaces with the chosen aerofoil sections [1]. These wings provide lift by creating a situation where the pressure above the wing is lower than the pressure below the wing. Since the pressure below the wing is higher than the pressure above the wing which makes an aircraft fly from the ground. The amount of lift needed by a plane depends on the purpose for which it is to be used. Heavier planes require more lift while lighter planes require less lift than that for the heavier ones. Thus, depending upon the use of aeroplane, aerofoil section is determined. Many aerofoils designed only for supersonic cruise performance, such as a diamond aerofoil, have very low lifting characteristics at slow speeds. To counteract this, for some wing designs, cambered aerofoils are used in some sections to provide lift for subsonic operation.

From the commercial passenger carriers to supersonic fighters used in defence services, everywhere there has been an exponential growth in the aviation industry. However, still there is a vast scope for further improvements. Here is a study that makes one such attempt. At present, different kinds of surface modifications are being studied to improve the manoeuvrability of the aircraft. Vortex generators are the most frequently used modifications to an aircraft surface [2]. Surface modification with vortex helps in delaying boundary layer separation and this type of flow control is more efficient than the other boundary layer control. Here dimples are used which act like vortex generator. In order to verify the effect of dimples, this computational study has been made starting from the study of inward and outward dimpled aerofoil. Based on the drag analysis, outward dimples were chosen due to better performance. Thereafter the study of different types of aerofoil shape such as – symmetrical, cambered and flat is done. Transition from laminar to turbulent flow due to the positioning of dimples at the surface strongly influences the flow separation and the skin friction, thus affecting aerodynamic characteristics of aerofoil [3]. Vortex generators create turbulence by creating vortices which delays the boundary layer separation resulting in decrease of pressure drag and also an increase in the angle of stall. A stall, as a threat to safe flight, is a condition in aerodynamics and aviation industries where the angle of attack increases beyond a certain value such that the airflow starts to separate and the lift begins to decrease drastically [4]. This critical angle is depended upon the aerofoil section or profile of the wing, its planform, its aspect ratio, and other factors, but is typically in the range of 8° to 20° relative to the incoming wind for most of the aerofoils. Airplane wing performance is often tainted by flow separation which mainly depends on the proper design and effective modifications [1]. Furthermore, non-aerodynamic constraints are often to be used in conflict with the aerodynamic restrictions, and flow control is required to overcome such problems.The surface modifications which are being considered in this study are layers of hexagonal dimples, semi cylindrical dimples and continuous strips; and the position of dimple layers in reference to chord. Flow remains attached with the surface at lower angle of attack. As soon as the angle of attack increases, the flow separation begins from the particular regime of aerofoil surface to the trailing edge of the aerofoil. The separated regions on the top of the aerofoil increase in size with the angle of attack and

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International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249 – 8958, Volume-9 Issue-1, October 2019

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Mrinal Kanti Manik, Radheshyam H. Gajghat, Anooj Joseph

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Keywords: *Jute fiber, Human hair, Coconut coir, Natural fibers, Epoxy resin, Composites.*

I. INTRODUCTION

Composite is a product made up of two or more different types of materials that are combined together to form something totally different than that of the original constituents. Structure of composite material is shown in figure 1 consist of outer cover generally called as matrix, mostly it protect the inner strengthening part of the composite called as fiber. Natural composites exist in both animals and plants. Wood is one of the best examples of natural composite – it is made from long cellulose fibers and much weaker matrix substance called lignin. Cellulose is also found in cotton, but without the lignin matrix, which cannot be bound together for strengthening. The bone in the human body is also a good example of natural composite.

Composites can be natural or synthetic. In the above example, wood is a natural composite whereas plywood is made of sawdust and ply, a man-made composite that combines natural and synthetic materials. Figure 2 shows an example of preparation of man-made composite.

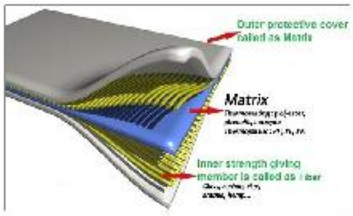

Figure 1 Structure of composite material

Figure 2 Preparation of man-made composite

In last few years, due to an environmental awareness the attention has been given to use the natural fiber composites in many industrial applications. Ecological balance and global warming have created a substantial interest in using natural materials to manufacture green products and reduce carbon dioxide emissions by all possible ways [1]. The environmental protection regulation act strictly focuses to find out environment friendly composite materials. At present it was observed that plant fibers are very eye-catching for composite materials for the following characteristic such as biodegradability, availability in abundance, renewability, high specific strength, low cost, and many more. However, there are few weaknesses such as incompatibility with some polymer matrix, the tendency to form aggregates during processing, and poor resistance to moisture absorption which reduce considerably the mechanical properties of the natural fibers reinforced composite materials [2]. Among all the natural fibers, jute fiber shows its good mechanical properties compared with other natural fibers, such as sisal, coir, and ramie [2]. Several authors have studied the jute fiber composites from different aspects, for example, mechanical properties [3], physical properties [4],

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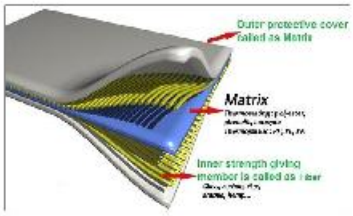

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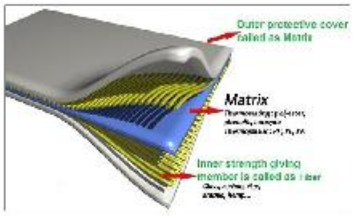

Figure 1 Structure of composite material

Figure 2 Preparation of man-made composite

In last few years, due to an environmental awareness the attention has been given to use the natural fiber composites in many industrial applications. Ecological balance and global warming have created a substantial interest in using natural materials to manufacture green products and reduce carbon dioxide emissions by all possible ways [1]. The environmental protection regulation act strictly focuses to find out environment friendly composite materials. At present it was observed that plant fibers are very eye-catching for composite materials for the following characteristic such as biodegradability, availability in abundance, renewability, high specific strength, low cost, and many more. However, there are few weaknesses such as incompatibility with some polymer matrix, the tendency to form aggregates during processing, and poor resistance to moisture absorption which reduce considerably the mechanical properties of the natural fibers reinforced composite materials [2]. Among all the natural fibers, jute fiber shows its good mechanical properties compared with other natural fibers, such as sisal, coir, and ramie [2]. Several authors have studied the jute fiber composites from different aspects, for example, mechanical properties [3], physical properties [4],

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Development Of A Model For Predicting The Performance Of Engineering Students In University Examination

Radheshyam H. Gajghat, Chandrahas C. Handa, Rakesh L. Himte

Abstract: This study was carried out to establish a mathematical relationship between influencing factors and the performance of engineering students in university examination. Passed/fail result in university examination was taken as performance measure. The exhaustive literature survey was carried out to explore the significant factors which influence the performance of university students. Also the opinion of stakeholders i.e. students and faculties was taken to add few more important factors in the list. Finally, 22 most important influencing factors were shortlisted for inclusion in the final questionnaire. This survey was conducted amongst the engineering students of technical institutions of Chhattisgarh, affiliated to Chhattisgarh Swami Vivekananda Technical University, Bhilai. Binary logistic regression method was used to formulate the mathematical model. This work will help the engineering students to improve their performance by predicting their probability of passing before appearing in examination.

Index Terms: Student performance, Influencing factors, Performing factors, Model formulation, Binary logistic regression, University examination.

1 Introduction

INDIA, the largest democracy of the world, has shown a stupendous growth of its techno-economic progress, over the last 70 years of post independence period. Gradually, India is becoming self reliance in different sectors and key areas including space technology, IT sector, and food security etc. Now, Indian economy has become world's largest sixth economy, above all making India proud by fulfilling the requirement of technical manpower of the advanced countries of the world. All this could be possible mostly because of combined efforts of Indian government and technical educational institutes (including private and government sector) of the country [1]. Number of private and government technical institutions has been started to fulfill the increased demand of technical manpower. At the time of independence, there were only 44 and 43 engineering colleges and polytechnics (including pharmacy and architecture institutions) with an intake capacity of 3200 and 3400 respectively. Due to the efforts and initiatives taken by the government during consecutive Five-year plans and particularly due to policy changed in the eighties which allowed participation of private and charitable organizations in the setting up of technical institutions on self-financing basis, the growth of technical education has become significant. Figure 1 shows the growth of All India Council for Technical Education approved undergraduate technical institutions [2] and figure 2 shows the growth of intake in AICTE approved technical institutions at undergraduate level [2-4].

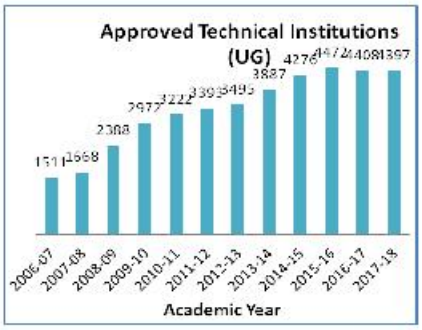

Figure 1: Growth of AICTE approved undergraduate technical institutions

The availability of large number of engineering seats in the country has created opportunity for 12th class science students with lower scores to take admission in undergraduate engineering courses, thereby reducing the university results. This poor result has also adversely affected the placement. As such now result of students has become the highest concern of engineering education system. If it is possible to know in advance which students are likely to fail, the corrective actions such as arranging extra and personal improvement classes, use of advanced tools for teaching, application of innovative teaching etc. can be taken by the college management or the teachers to improve the results. This will certainly help in improving the placements also. Good placement is the most important factor that will help the college to attract the students [5].

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A New Model of M-secure Image Via Quantization

Vijay Bhandari, Sitendra Tamrakar, Piyush Shukla and Arpana Bhandari

1 Introduction

Steganography [1–4] and steganalysis [5] have more focus in the fields concerning law enforcement [6–8] and national strategic defence. It is carving and mastery [9] of the uncover secret intelligence in the cover forum [10, 11]. Contrary between steganalysis and steganography [12, 13] is the exposure of masked secret data embedded in the cover media also called as stego image. Image encryption [9, 10] makes use of the natural possessions of an image [1, 6], such as high dismissal and well-built spatial correlation. The encryption technique protects illegal access of the data. The encrypted image [9, 14] is a noisy image such that no one can obtain the secret image [2, 9] data without the correct key. The steganography [8] contains hidden a digital picture into another cover multimedia data such as image [9] and video. Steganography technique [1–3, 6] is used when encryption [3, 4, 6] is not acceptable. The purpose of steganography [8] embeds secret data in the reselected image [9]. The structure of the paper consists of mosaic figure generation and existing work, proposed work, and the results are compared based on different parameters and conclusion.

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Interval valued multi criteria decision making methods for the selection of flexible manufacturing system

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ABSTRACT

In real world multi criteria decision making (MCDM) problem, it is tough to solve a decision matrix with vague and imprecise data. The degree of impreciseness depends on the kind of data available. For interval valued data this impreciseness is less and interval-valued MCDM methods can be effectively used to solve the problem. A flexible manufacturing system (FMS) selection problem was taken into consideration to find the best FMS among available alternatives. An interval extension of CODAS method is proposed in this paper which was used to solve the problem along with two other interval-valued decision-making methods i.e. interval-valued TOPSIS, interval-valued EDAS. All the three methods are distance-based approaches and it was found that the interval-valued CODAS method gave the exact same ranking with that of interval-valued TOPSIS and interval-valued EDAS.

1. Introduction

Flexible-manufacturing system (FMS) is a system which integrates programmable devices, equipment and machines with a computer for manufacturing an extensive range of products. There are various conflicting criteria like costs, efficiency, flexibility, etc. on which the selection of FMS depends. Hence Multi Criteria Decision Making (MCDM) methods play a crucial role in the selection of best FMS among available alternative. Generally, the decision matrix in MCDM problem consist of crisp numeric values (ordinary data), but in practical there are many instances where it's tough to get these crisp numeric values. Instead of ordinary data the values can be fuzzy data or interval data. These fuzzy or interval valued data are imprecise in nature and cannot be used for direct calculations using conventional MCDM methods. So, these data are either converted into crisp score or modified formula are used to solve the problem. Researchers have created and extended many conventional MCDM methods to interval-valued

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Experimental Investigation To Examine The Effect Of Shape And Size Of Dimples At Suction Surface Of Aerofoil

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Experimental Investigation To Examine The Effect Of Shape And Size Of Dimples At Suction Surface Of Aerofoil

Diksha Singh, Radheshyam H. Gajghat, Mrinal Kanti Manik

Abstract: Aerofoil, the cross-sectional shape of a wing, has a significant role in any aircraft due to its capability of generating adequate lift to hold that aircraft in the air with less drag. The design of the aerofoil with desired aerodynamic characteristics is not so easy till date. Although, at early stages of technical development, it was compromised with the performance due to the random designing while test in a flow section. But as time rolled on to the later phase of the development era, Wright brothers (Orville Wright and Wilbur Wright) came with the cambered section. At present NACA (National Advisory Committee for Aeronautics) has given a proper definition for Aerofoil, which helps us design aerofoil using formula instead of randomizing it, to achieve the optimal performance to some extent. In this work, an experimental investigation was carried out to enhance the performance of an Aerofoil NACA 4311 by surface modification. Initially the aerodynamic performance of three different shapes viz. cambered, flat and symmetrical shaped aerofoil was checked experimentally. Based on this investigation it was concluded that symmetrical aerofoil gave quite better performance than cambered and flat shaped aerofoil. After surface modification by placing dimples of different sizes and shapes at suction surface of symmetrical aerofoil, it was found that the medium semi cylindrical dimples gave better aerodynamic performance as compared to other modifications.

Index Terms: Aerofoil, Lift, Drag, Stall angle, Lift to Drag ratio, Reynolds number.

1. INTRODUCTION

THE thought of birds' flying transformed into technology on the day of 17th December, 1903 when Wright Brothers gave human race new wings and thereafter continuous endeavours is going on this field. Researchers have put in their enormous effort with progress to a great extent but still, there are many more findings to be done to get freedom in the air. Continuous attempts have been made to enhance the performance of lift, speed and aerodynamic efficiency of an aircraft by reducing drag. Aircraft wings are the lifting surfaces with the chosen aerofoil sections [1]. These wings provide lift by creating a situation where the pressure above the wing is lower than the pressure below the wing. Since the pressure below the wing is higher than the pressure above the wing which makes an aircraft fly from the ground. The amount of lift needed by a plane depends on the purpose for which it is to be used. Heavier planes require more lift while lighter planes require less lift than that for the heavier ones. Thus, depending upon the use of aeroplane, aerofoil section is determined. Many aerofoils designed only for supersonic cruise performance, such as a diamond aerofoil, have very low lifting characteristics at slow speeds. To counteract this, for some wing designs, cambered aerofoils are used in some sections to provide lift for subsonic operation.

From the commercial passenger carriers to supersonic fighters used in defence services, everywhere there has been an exponential growth in the aviation industry. However, still there is a vast scope for further improvements. Here is a study that makes one such attempt. At present, different kinds of surface modifications are being studied to improve the manoeuvrability of the aircraft. Vortex generators are the most frequently used modifications to an aircraft surface [2]. Surface modification with vortex helps in delaying boundary layer separation and this type of flow control is more efficient than the other boundary layer control. Here dimples are used which act like vortex generator. In order to verify the effect of dimples, this computational study has been made starting from the study of inward and outward dimpled aerofoil. Based on the drag analysis, outward dimples were chosen due to better performance. Thereafter the study of different types of aerofoil shape such as – symmetrical, cambered and flat is done. Transition from laminar to turbulent flow due to the positioning of dimples at the surface strongly influences the flow separation and the skin friction, thus affecting aerodynamic characteristics of aerofoil [3]. Vortex generators create turbulence by creating vortices which delays the boundary layer separation resulting in decrease of pressure drag and also an increase in the angle of stall. A stall, as a threat to safe flight, is a condition in aerodynamics and aviation industries where the angle of attack increases beyond a certain value such that the airflow starts to separate and the lift begins to decrease drastically [4]. This critical angle is depended upon the aerofoil section or profile of the wing, its planform, its aspect ratio, and other factors, but is typically in the range of 8° to 20° relative to the incoming wind for most of the aerofoils. Airplane wing performance is often tainted by flow separation which mainly depends on the proper design and effective modifications [1]. Furthermore, non-aerodynamic constraints are often to be used in conflict with the aerodynamic restrictions, and flow control is required to overcome such problems.The surface modifications which are being considered in this study are layers of hexagonal dimples, semi cylindrical dimples and continuous strips; and the position of dimple layers in reference to chord. Flow remains attached with the surface at lower angle of attack. As soon as the angle of attack increases, the flow separation begins from the particular regime of aerofoil surface to the trailing edge of the aerofoil. The separated regions on the top of the aerofoil increase in size with the angle of attack and

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Safeguarding Privacy of Data in Cloud Environment using Advanced RTPP technique

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Abstract
Cloud Computing in Mobile is getting growing interest due to its wide applicability and adaptively in variety of social, industrial and commercial mobile applications. Mobile and smart devices can share complex computational operations with Cloud Service Providers (CSP). It also provides storage, access polices enforcement and security operations. In many cases, CSP requires services from crowd contributors CCs for data collection, sharing and mobile application support. It requires trust management for CC to guard against malicious CC (Cloud Computing) and ensure security and privacy of data. However, end users or data requesters also demand reliable security solutions for sharing their data or accessing data from unknown CC[1].
To ensure strong security, mobile devices are not computationally feasible to perform complex cryptographic operations for desired privacy. To resolve these issues, Reputation-aware Trust and Privacy Preservation (RTPP) scheme for MCC. In this paper we are going to proposed an algorithm called ARTPP (Advance Reputation-aware Trust and Privacy Preservation) to analyze the annotations and semantic based relationship identification for the attributes in policy trees for evaluate its impact for attribute based encryption and for identifying linkage for reputation as well.

Key Word: Cloud Computing, RTPP, ARTPP, Cryptography and CSP etc....

Introduction
Portable Cloud Computing (MCC) gives broad help to preparing and capacity to asset obliged cell phones. Versatile with on board sensors can screen wonder[2]. Like body sensors can offload reports to cloud for consistent and secure checking by specialists at clinics or anyplace else. It can spare preventable loss of valuable human lives by taking moment prudent steps without racing to clinic. MCC engineering comprises of phones, web and cloud which makes it a unique instance of Cloud Computing[3].
It has improved the capacities of cell phones to perform complex activities. Despite the fact that use of re-appropriates is an answer for a few issues however it makes different issues as well. Protection of delicate data is a standout amongst the most essential worry of the present world[4]. Trust on the rightness of detailed information to cell phones is suspicious, as outsider sellers who give administrations at cloud can't be completely trusted. In the engineering of MCC, work is done in such design that information is put away and preparing takes place on outer sources instead of on the cell phones. Trust and Reputation frameworks in conveyed situations accomplish far reaching enthusiasm as online networks are turning into an intrinsic piece of the day by day schedule of Internet clients[5].
Trust-based models empower more secure activity inside networks to which data trade and distributed collaboration are driven. A few models for trust based notoriety have been proposed as of late. In these models, the emotional notoriety of a part is processed utilizing data given by a lot of individuals trusted by the last mentioned. The present paper talks about the calculation of notoriety in such models, while protecting individuals' private data. Three distinct plans for the private calculation of notoriety are exhibited, and the favorable circumstances and drawbacks as far as security and correspondence overhead are dissected[6].

Related Work
Exploiting the information gathering capacity of remote sensor systems (Wireless Sensor Networks) just as the information stockpiling and preparing capacity of versatile distributed computing (MCC), WSN-MCC coordination is pulling in huge consideration from both scholarly world and industry [7].
This paper centers around handling of the tactile information in WSN-MCC reconciliation, by recognizing the basic issues concerning WSN-MCC combination and proposing a novel tangible information preparing system, which goes for transmitting attractive tactile information to the portable clients in a quick, dependable, and secure way[8]. The proposed structure could draw out the WSN lifetime, decline the capacity prerequisites of

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Luminescence Properties of Calcium Aluminate Phosphors

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Abstract

Luminescence properties of $CaAl_2O_4$ were studied. Rare earth Eu^{2+} doped alkaline earth aluminate $CaAl_2O_4$ phosphor was prepared by combustion synthesis using urea as a fuel at 600 °C. It was found that firstly the TL intensity increases with increase in UV irradiation time and it attains a maximum value for 15 minute irradiation time. TL intensity decreases with further increase in irradiation time. In photoluminescence (PL) spectrum, a broad emission peak of Eu^{2+} ion was observed in blue region at 441 nm, under 363 nm excitation due to transition from the $4f^6 5d^1$ to the $4f^7$ configuration of the Eu^{2+} ion. Optimum intensity of photoluminescence (PL) was found to be 0.05 mol% concentration of Eu^{2+}.

Keywords: Thermoluminescence (TL), Photoluminescence (PL), Aluminate phosphors

1.0 INTRODUCTION

Alkali halides have been a subject of study for the past six decades. They have lent a helping hand in understanding the physics of the solid state. The alkaline earth aluminates MAl_2O_4 are an important class of phosphorescence materials because of their high quantum efficiency in visible region [1], long persistence of phosphorescence, good stability, color purity and good chemical, thermal and radiation resistance [2-3]. Rare earth and non-rare earth inorganic phosphors are widely used in a variety of applications, such as light industry, radiation measurement, X-ray imaging technique and colour display [4]. Several aluminates are used as hosts for doping rare earth ions in luminescent applications. The luminescence in the visible region of Eu^{2+} doped alkaline earth aluminates $MAl_2O_4:Eu^{2+}$ (M = Ca, Ba, Sr) phosphor is of special interest in recent years due to these compounds, which are chemically stable and safe with very bright photoluminescence properties. Several scholars have made extensive investigations concerning the next generation of displays and lighting devices [5–7]. The rare earth metal ion-doped calcium aluminate phosphors, because of their high quantum efficiency, anomalous long phosphorescence and good stability, have been studied in depth and used widely. In particular $BaAl_2O_4:Eu^{2+}$, Nd^{3+} has been considered as a useful violet phosphor in the application of luminous clocks and watches as well as potential outdoor night time displays [8]. Aluminates of Ca, Ba and Sr doped with Eu^{2+} activator ion possess safe, chemically stable and intense photoluminescence in visible light [9, 10] compared with the conventional sulfide-based phosphors. These properties make them useful in many applications, such as luminous paints in highway, airport, buildings and ceramic products, in textile, dial plate of glow watch, warning signs and the escape routes [11].

Recently many studies on phosphors with calcium aluminate as host based on their persistent luminescence and photoconductivity spectrum have been reported [12]. Many phosphors such as $CaAl_2O_4:Eu^{2+}$, Dy^{3+} [13] and $CaAl_2O_4$: Ce^{3+} [14] were developed for their photoluminescence and high chemical stability.

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Photocatalytic Properties of Strontium Aluminate Phosphors: A Review

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Abstract: ***This paper reviews the photocatalytic properties of $SrAl_2O_4$ phosphors. These phosphors have been synthesised by different roots and its photocatalytic properties have been studied by different groups. Results shows that $SrAl_2O_4$ phosphors are better photocatalytic materials than the conventional TiO_2 based materials, as they are non-toxic and can be removed from water after removal of dyes.***

Keywords: Photocatalytic, $SrAl_2O_4$, non-toxic, Dyes, Phosphors.

I. INTRODUCTION

The technological advancements have provided many facilities to man kinds. On the other hand, it has damaged environment greatly and we can see pollution in all aspects of life. The water, soil and air pollution has reached to alarming level. Urbanization caused human wastes like fats, grease, ammonia, heavy metals, organic compounds etc. to pollute water. Industrialization caused release of toxic industrial wastes, dyes, plastic and non-bio-degradable items in water. The use of heavy fertilizers and pesticides in agriculture polluted soil as well as water, causing water unsafe for use. Hence some technologies are now required which are eco-friendly as well as which can clean the polluted environment.Advanced oxidation processes (AOP) are the techniques to remove different types of pollutants effectively. It is based on production of oxidizing hydroxyl radicals (-OH) and superoxide radical anion ($-O_2$) which are readily available to react with pollutants. Photocatalytic oxidation (PCO) is form of AOP in which the visible/UV radiation induces catalytic reaction. This method is more environmentally friendly as the material used are nontoxic, cost effective and chemically stable in water [1]. Photocatalysts are materials that change the rate of reaction in presence of light. Photocatalytic reaction is classified into two groups namely Homogeneous and Heterogeneous photocatalysis, based on whether the reactant and the photocatalytic materials are in same phase or different phases. Photocatalysts can be used for water treatment, air purification, antifogging, self-cleaning devices, deodorization etc. When radiation of sufficient energy is made incident (The band gap of material should be less than the energy of incident photon) on the photocatalytic material, the electrons are excited from valence band to conduction band and electron-hole pair is generated, the electron is available to reduce any acceptor molecule and hole is available to reduce any donor molecule simultaneously. The reduction of oxidation reaction depends upon the relative positions of redox level of molecule and the band gap of the material. If the redox level is lower than the conduction band reduction of molecule takes places Fig. 1(A); If the redox level is higher than valence band oxidation of molecule can take place as shown in fig.1(B); When redox level is between the conduction and valence band of material redox reaction takes place fig. 1(C) and if the redox level is neither below CB nor above VB Fig. 1(D) then no reaction takes place [2].

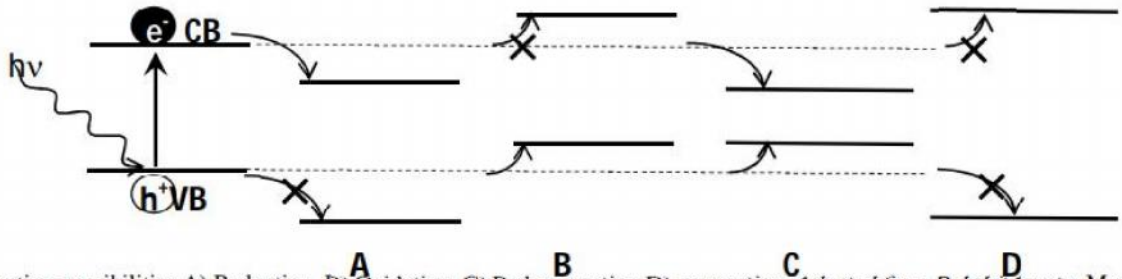

Fig.1 Reaction possibilities A) Reduction, B) Oxidation, C) Redox reaction D) no reaction. Adapted from RakshitAmeta, Meenakshi S. Solanki, Surbhi Benjamin, Suresh C.Ameta "Photocatalysis"Advanced Oxidation Processes for Waste Water Treatment, 2018, Pages 135-175.

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Photocatalytic Properties of GO/CdS/$(Cd_{0.8}Zn_{0.2})S/TiO_2$ Binary and Ternary Nanocomposites

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Abstract: GO-CdS, GO-$(Cd_{0.8}Zn_{0.2})S$, GO-TiO_2, GO-CdS-$(Cd_{0.8}Zn_{0.2})S$, GO-CdS-TiO_2 binary and ternary nanocomposites were prepared by chemical bath precipitation method at 80°C for 2 hours and their photocatalytic properties were investigated. The measurement of photocatalytic degradation of Rhodamine B dye was carried out under visible light for single materials as well as binary and ternary composites. The photocatalytic efficiency of the synthesized nanocomposites was calculated and was found to be higher for the ternary nanocomposites in comparison to binary and single materials. The nanocomposites were further characterized by XRD, SEM and EDX studies. XRD studies show planes of CdS and ZnS in binary nanocomposites while in the ternary composites, planes corresponding to CdS, ZnS and TiO_2 are observed. SEM images show a non-uniform distribution of spherical particles forming clusters on the surface of GO sheets. EDX spectra confirm the presence of C, O, S, Cd, Zn and Ti with excess Carbon. The studies suggest that the synthesized ternary nanocomposites are quite efficient materials as adsorbents for photocatalytic degradation of dyes from waste water.

Index Terms: GO, photocatalysis, binary and ternary nanocomposites, waste water treatment.

I. Introduction

Nanotechnology for water and waste water treatment is gaining momentum globally. The unique properties of nanomaterials and their convergence with current treatment technologies present great opportunities to revolutionise water and waste water treatment. An important technology that shows most promise in full scale application in the near future is photocatalysis.

The II–VI semiconductor, particularly CdS, is a good candidate for photocatalysis of organic dyes from water. Although the photo generated electrons and holes play a vital role in photo catalytic disinfection, their recombination result in low efficiency of photo catalysis. Hybrid of CdS with some support materials like Graphene/Graphene Oxide (GO) can delay the recombination process as well as adsorb the pollutants [1,2,3,4].

There have been reports that nanocomposites composed of CdS/ZnS and Graphene/Graphene Oxide showed significantly improved photocatalytic properties. Studies have also shown that incorporation of Graphene/Graphene Oxide with appropriate ratio of CdS to ZnS causes improved charge separation and enhanced visible light absorption and also exhibited a red-shift in band-edge compared to Graphene–CdS composites [5]. Several methods like hydrothermal, solvothermal, CBD, microwave method have been employed to synthesis these nanocomposites. However, much work has not done in achieving a cost-effective method in their synthesis.

Some researchers have also reported a ternary photocatalyst system such as rGO/TiO_2/ZnO[6], rGO/$CoFe_2O_4$/TiO_2[7], rGO/Ag/TiO_2/Fe_2O_3[8], rGO/CdS/ZnO[9], and rGO/W/$BiVO_4$[10]. The competency of the ternary system was investigated and compared using a binary system (coupled with GO) and single photocatalyst material. The degradation of the ternary system was superior as confirmed by [6,8,9]. There was an improved surface area for the ternary system nanocomposite, which resulted in an increased adsorptivity, as reported by [6,7].

There have been no reports so far of synthesis of GO/CdS/$(Cd_{0.8}Zn_{0.2})S/TiO_2$ binary and ternary nanocomposites by the simple low cost and low temperature technique of chemical bath precipitation. The present paper reports the synthesis of GO/CdS/$(Cd_{0.8}Zn_{0.2})S/TiO_2$ binary and ternary nanocomposites by chemical bath precipitation method at 80°C for 2 hours and their photocatalytic properties were investigated. A comparative study of the photocatalytic behaviour of single material as well as the binary and ternary nanocomposites was done and the photocatalytic efficiency was calculated. The materials were further characterized by XRD, SEM and EDX studies.

II. Experimental Techniques

2.1 Synthesis of Graphene Oxide by Modified Hummer's Method:

Graphene oxide was produced from pure graphite using modified Hummer's method [11]. 108ml of conc Sulphuric acid (H_2SO_4) and 12ml of Phosphoric acid (H_3PO_4) in the volume ratio of 9:1 were mixed and stirred for several minutes. While stirred, 0.9g of graphite powder was added followed by slow addition of 5.28g of Potassium Permanganate ($KMnO_4$). The mixture was stirred for 6 hours until the solution turned dark green.2.7ml of hydrogen peroxide (H_2O_2) was added drop wise slowly and stirred for 10 minutes for eliminating the excess of $KMnO_4$. The solution was cooled. 20ml of Hydrochloric Acid (HCl) and 60ml of deionized water was added and centrifuged for 7 minutes. The supernatant was decanted away and the residuals were rewashed again with HCl and deionized water for 3 times. The washed GO solution was dried in oven at 90°C for 24 hours. The GO powder obtained is of greenish-black colour.

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Photocatalytic Properties of GO/CdS/$(Cd_{0.8}Zn_{0.2})S/TiO_2$ Binary and Ternary Nanocomposites

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[1]M. Tech Student, [2]Professor, [3]Assitant Professor
[1]Department of Nanotechnology,
[1] Christian College of Engineering & Technology, Bhilai, Durg, Chhattisgarh, India.

Abstract: GO-CdS, GO-$(Cd_{0.8}Zn_{0.2})S$, GO-TiO_2, GO-CdS-$(Cd_{0.8}Zn_{0.2})S$, GO-CdS-TiO_2 binary and ternary nanocomposites were prepared by chemical bath precipitation method at 80°C for 2 hours and their photocatalytic properties were investigated. The measurement of photocatalytic degradation of Rhodamine B dye was carried out under visible light for single materials as well as binary and ternary composites. The photocatalytic efficiency of the synthesized nanocomposites was calculated and was found to be higher for the ternary nanocomposites in comparison to binary and single materials. The nanocomposites were further characterized by XRD, SEM and EDX studies. XRD studies show planes of CdS and ZnS in binary nanocomposites while in the ternary composites, planes corresponding to CdS, ZnS and TiO_2 are observed. SEM images show a non-uniform distribution of spherical particles forming clusters on the surface of GO sheets. EDX spectra confirm the presence of C, O, S, Cd, Zn and Ti with excess Carbon. The studies suggest that the synthesized ternary nanocomposites are quite efficient materials as adsorbents for photocatalytic degradation of dyes from waste water.

Index Terms: GO, photocatalysis, binary and ternary nanocomposites, waste water treatment.

I. Introduction

Nanotechnology for water and waste water treatment is gaining momentum globally. The unique properties of nanomaterials and their convergence with current treatment technologies present great opportunities to revolutionise water and waste water treatment. An important technology that shows most promise in full scale application in the near future is photocatalysis.

The II–VI semiconductor, particularly CdS, is a good candidate for photocatalysis of organic dyes from water. Although the photo generated electrons and holes play a vital role in photo catalytic disinfection, their recombination result in low efficiency of photo catalysis. Hybrid of CdS with some support materials like Graphene/Graphene Oxide (GO) can delay the recombination process as well as adsorb the pollutants [1,2,3,4].

There have been reports that nanocomposites composed of CdS/ZnS and Graphene/Graphene Oxide showed significantly improved photocatalytic properties. Studies have also shown that incorporation of Graphene/Graphene Oxide with appropriate ratio of CdS to ZnS causes improved charge separation and enhanced visible light absorption and also exhibited a red-shift in band-edge compared to Graphene–CdS composites [5]. Several methods like hydrothermal, solvothermal, CBD, microwave method have been employed to synthesis these nanocomposites. However, much work has not done in achieving a cost-effective method in their synthesis.

Some researchers have also reported a ternary photocatalyst system such as rGO/TiO_2/ZnO[6], rGO/$CoFe_2O_4$/TiO_2[7], rGO/Ag/TiO_2/Fe_2O_3[8], rGO/CdS/ZnO[9], and rGO/W/$BiVO_4$[10]. The competency of the ternary system was investigated and compared using a binary system (coupled with GO) and single photocatalyst material. The degradation of the ternary system was superior as confirmed by [6,8,9]. There was an improved surface area for the ternary system nanocomposite, which resulted in an increased adsorptivity, as reported by [6,7].

There have been no reports so far of synthesis of GO/CdS/$(Cd_{0.8}Zn_{0.2})S/TiO_2$ binary and ternary nanocomposites by the simple low cost and low temperature technique of chemical bath precipitation. The present paper reports the synthesis of GO/CdS/$(Cd_{0.8}Zn_{0.2})S/TiO_2$ binary and ternary nanocomposites by chemical bath precipitation method at 80°C for 2 hours and their photocatalytic properties were investigated. A comparative study of the photocatalytic behaviour of single material as well as the binary and ternary nanocomposites was done and the photocatalytic efficiency was calculated. The materials were further characterized by XRD, SEM and EDX studies.

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NANOSYSTEMS: PHYSICS, CHEMISTRY, MATHEMATICS, 2019, 10 (6), P. 711–719

A comparative study of the effect of solvents on the optical, structural and morphological properties of ZnO–GO nanocomposites synthesized by sol-gel method

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DOI 10.17586/2220-8054-2019-10-6-711-719

Zinc Oxide-Graphene Oxide (ZnO–GO) nanocomposites were prepared using solvents polyvinylpyrrolidone (PVP) and N-Methyl-2 Pyrrolidone (NMP) by sol-gel technique and their optical, structural and morphological properties were investigated. X-ray Diffraction (XRD) studies show the presence of planes of GO and ZnO confirming the formation of composites. The particle sizes were calculated using Scherrer's formula and were found to be in the nanometer range. Scanning Electron Microscopy (SEM) images show the formation of layered structures dispersed non-uniformly over clusters of particles. Energy Dispersive X-Ray (EDX) spectra confirm the presence of carbon, zinc and oxygen in the composites. The optical absorbance of ZnO–GO synthesized using PVP was higher than ZnO–GO with NMP with the absorption edge shifting to shorter wavelength in the presence of NMP. The band gap values were found to be in the range of 2.7–3.0 eV. The band gap of ZnO–GO synthesized using NMP was higher than ZnO–GO synthesized using PVP.

Keywords: GO, ZnO, ZnO–GO Nanocomposite, PVP, NMP.

Received: 2 November 2019

Revised: 30 November 2019

1. Introduction

Zinc Oxide (ZnO), a wide band gap II–VI semiconductor has been a subject of extensive research owing to its numerous interesting properties, making it a desirable material for application in conductive oxide [1], solar cell [2], display and sensors [3, 4], and photocatalysis [5, 6]. However, pure ZnO suffers from weak photo response [7], fast recombination of electron-hole pairs [8] and low operating speed.

GO is a layer of graphene functionalized with oxygen-containing moieties, such as hydroxyl (OH), carbonyl (C=O) and alkoxy (C–O–C) groups. It possesses unique properties that are different from graphene due to the existence of various oxygenated functional groups on the surface of GO. Graphene Oxide (GO) has attracted researchers due to its high surface area, high mobility of charge carriers and excellent stability. Hybrid of GO and ZnO (nanocomposites) can offer better prospects to enhance the photoresponsivity, stability and flexibility of ZnO for various applications [9, 10].

ZnO can be prepared by different means, of which the sol-gel is a popular method because of its low cost, reliability, reproducibility, simplicity. The choice of solvents used for reaction and capping the particles affects the shape and size of the composites [11]. Although there have been several reports on the synthesis of these composites using different solvents, a comparative study of the effect of solvents on the properties of the composites have not been presented to date. In the present work ZnO–GO nanocomposites were prepared using two polymer solvents – PVP and NMP. There are reports that a polymer matrix is useful in the formation of nanoparticles as it possesses the properties of the host polymer as well as the guest nanoparticles [12]. The polymers can also help in easier shaping and formation of the composite materials. PVP is a good surface stabilizer, growth modifier and particle disperser [13]. It also inhibits agglomeration by steric effect [14]. NMP is a 5 member ring compound containing nitrogen. It has high dissolving power and high purity. It can dissolve organic and inorganic compounds well or even better than chlorofluorocarbon (CFC) solvents. This paper presents the structural, morphological and optical characterization of ZnO–GO nanocomposites prepared using PVP and NMP as capping agents.

2. Experimental techniques

2.1. Synthesis of Zinc Oxide (ZnO)

ZnO nanoparticles were synthesized by sol gel method. The appropriate quantity of Zinc acetate was dissolved in deionized water and mixed with an equal quantity of aqueous 0.05 M NaOH solution slowly with continuous stirring at 50 °C. The reaction mixture was maintained at this temperature for 2 hours and then cooled to room temperature. The resultant precipitate was centrifuged and then washed with deionized water and dried at room temperature.

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YEAR: 2018

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International Journal of Advanced in Management, Technology and Engineering Sciences ISSN NO : 2249-7455

STUDIES ON THE EFFECTS OF VARIOUS MINERAL ACIDS ON THE LIGNIN PRECIPITATED FROM SODA LIQUOR OF IPOMOEA CARNEA

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1. *Associate Professor, Department of Applied Chemistry ,Christian College of Engg. & Technology, Bhilai. (C. G.) nandinipreeti@gmail.com

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Abstract

Non wood plants can be used as raw material where wood is scarce. Soda lignin from ipomoea carnea was directly isolated by various mineral acids i.e. sulphuric acid, hydrochloric acid, phosphoric acid and nitric acid at three different levels of concentration. The physico chemical properties and structural features of isolated lignin were compared. Characterisation of lignin sample was carried out by Fourier Transform Infrared Spectrometry, Ultraviolet spectrometry and High Performance Liquid chromatography (HPLC). As per the FTIR report, there is no significant difference between the main structures of the lignin with the use of various acids, but low concentration of phosphoric acid is preferable as it gives highest yield. From the UV studies it was observed that phosphoric acid gave the highest absorbance value out of the four acids used in the study.

KEY WORDS: Ipomoea carnea , lignin, mineral acids ,black liquor, characterization,

1. INTRODUCTION:-

The scarcity and the restricted supply of high quality pulp and the rising price of utilities is for cing paper mills to adopt new technologies to conserve energy, minimum inputs, keeping environmental aspects in view, much efforts have been directed towards finding a chemical pulping process which gives higher pulp yield coupled with economic and environmental considerations.Paper industry is one of the industry which is expanding rapidly to fulfill the demand of pulp and paper products but it is expected that the gap between demand and supply will increase in population growth and advancement in civilization. From the last three decade there is constant pressure to explore available non wood resources for pulp and paper making.

International Journal of Management, Technology And Engineering ISSN NO : 2249-7455

A Study of Performance of HEV Run By Hybrid Power Sources by using Supercapacitor Bank, Ultrabattery And Fuel Cell

Prashant Bawaney[1*] DR . Nagendra Tripathi[2] Shailendra Verma[3] Nirbhay K Singh[4]
CCET BHILAI BIT DURG SSGI BHILAI KCET BHILAI

ABSTRACT

Recently a growing interest on utilizing renewable and green energy has been motivated by rapidly increasing oil prices, limited fossil fuel reserves and growing environmental green awareness. Since the energy density of supercapacitor is less but power density is thousand time more than that of battery, ultrabattery is a hybrid energy-storage device, which combines the best of asymmetric supercapacitor and battery in a unit cell without any extra electronic controls. Fuel cell can also be used as an electric source. This paper deals with model of HEVs run by hybrid power sources in which a supercapacitor bank, ultrabattery and fuel cell are used as main source, a dc link and supercapacitors as transient power source, the comperative analysis of performance of models of HEV is simulated with the help of MATLABSIMULINK software. comparative performance of HEV is discussed in detail. This sutudy in fact gives an idea to construct supercapacitor pack of appropriate power and energy density for HEV and minimize the dependence on battery.

KEYWORD: Supercapacitor; Ultrabattery; Fuel cell, DC/DC converter; HEV

INTRODUCTION

The present rate of reliance and consumption of fossil fuels for electrification or transportation is 10^5 times faster than the rate at which they are being created by natural sources.In fact,19th and 20th century were the century of the steam engine and internal combustion engine respectively and 21st century will be definetly the century of the battery, supercapacitor, ultrabattery and fuel cell[1]. Fuel cells (FCs) produces an electrical energy from an electrochemical reaction between a hydrogen-rich fuel gas and an oxidant. They convert hydrogen, or hydrogencontaining fuels, directly into electrical energy plus heat through the electrochemical reaction of hydrogen and oxygen into water. Supercapacitors are able to hold much greater charge and able to release an enormous amount of power in a very short time it has an excellent power density, 1000 times more than some batteries, very good load characteristics with efficiency of almost 100% compared with batteries that only have 50-60% but have low energy density, up to 300 times less than batteries. Aging is not an issue for the supercapacitor it is not subjected to over voltages, too large currents and too high temperatures, its lifetime can be up to almost 80 years. It is also possible to deep cycle it more than $5x10^6$ times, very rapid charging. But there is some limitation of low energy density, low voltage, high self discharge.[2] Whereas batteries can release steady voltage for a longer period of time. An ultrabatery is a recent technology which is the combination of supercapacitor and battery in single unit cell. The present paper is a comparative study of performance of HEV model run by (i)Ultrabatery (ii)Combination of supercapacitor and ultrabattery (iii)Combination of supercapacitor and fuel cell In this study the MATLABSIMULINK is used for fabrication of model.

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A Review on Tri-Directional Functionally Graded Beam with Various Boundary Condition

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Abstract

Functionally graded beam is a type of composite beam where the variation of material properties is created artificially as per a predefined function. This variation of material properties may be in any single dimensional direction or any two dimensional directions or in all the three dimensional direction. This governing function may be standard or may be customized as any author derives it. The structural behavior and the modal characteristic of a functionally graded beam depend upon the nature of governing function of the properties of the graded beam. In the present manuscript, forced vibration of tri-directional functionally graded material (TDFGM) beam due to a moving load is studied by using the energy approach. It is assumed that the material properties of the beam change exponentially in both axial and thickness directions. At the same time, free vibration frequencies are presented. The influences of the material gradation, moving load velocity, aspect ratio and boundary conditions on the dynamic responses of TDFGM beam is examined in detail.

Keywords:*Functionally graded beams, Natural frequency, Free vibration*

1.Introduction

Pure metals are of little use in engineering applications because of the demand of conflicting property requirement. For example, an application may require a material that is hard as well as ductile, there is no such material existing in nature. To solve this problem, combination (in molten state) of one metal with other metals or non-metals is used. This combination of materials in the molten state is termed alloying (recently referred to as conventional alloying) that gives a property that is different from the parent materials. Bronze, alloy of copper and tin, was the first alloy that appears in human history. Since then, man has been experimenting with one form of alloy or the other with the sole reason of improving properties of material. When more quantity of the alloying material is desired, then the traditional alloying cannot be used. Another limitation of conventional alloying is when alloying two dissimilar materials with wide apart melting temperatures; it becomes prohibitive to combine these materials through this process.

Composite material are a class of advanced material, made up of one or more materials combined in solid states with distinct physical and chemical properties. Composite material offers an excellent combination of properties which are different from the individual parent materials and are also lighter in weight. Composite materials will fail under extreme working conditions through a process called delamination (separation of fibers from the matrix) .This can happen for example, in high temperature application where two metals with different coefficient of expansion are used. To solve this problem,the FGM concept originated by researchers in Japan in 1984 during the space-plane project, in the form of a proposed thermal barrier material capable of withstanding a surface temperature of 2000 K and a temperature gradient of 1000 K across a cross-section <10 mm, came up with a novel material called Functionally Graded Material (FGM).

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Sierpinski Carpet Patterned Rectangular Dielectric Resonator Antenna for X-Band Application Using Teflon

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Abstract—This paper presents a wideband Sierpinski carpet fractal patterned rectangular Dielectric Resonator Antenna (DRA) operating in the X-band, which is characterized by dielectric waveguide model method (DWM). In order to decrease the cost of the DRA the low-cost teflon is used as the material. A prototype is realized to validate the results of the simulation. The paper provides a comparison between conventional rectangular DRA and fractal shaped rectangular DRAs of the first and the second iterations. The antenna design methodology is discussed along with its resonance and radiation characteristics. The validity of the obtained results is proved by the close match of the experimental and simulation results. The measurements on prototype show impedance bandwidth of 48% covering the entire X-band with similar radiation pattern throughout the band with a gain of 7.5 dBi over 9.0–11.5 GHz.

DOI: 10.3103/S0735272718120051

1. INTRODUCTION

Present and future wireless communication systems need antennas capable of supporting higher data rates and increased user densities. The researchers have renewed interest in the development of wideband and multiband antennas, including multiple antennas, usually with the same characteristics, that are physically separated from each other. This is beneficial for the mobile communication industry since it allows multiple users to share a limited communication spectrum and avoid co-channel interference.

Due to their small size, planar microstrip antennas are the common choice as radiators in mobile communication devices. Ohmic and surface wave losses increase with frequency in case of the microstrip antenna. Besides, they are inherently narrowband. On the other hand, dielectric resonator antenna (DRA) proposed in 1983 [1], has several advantages like low ohmic loss (due to the absence of conductors), low cost, small size and wider bandwidth when compared to microstrip antennas [2]. Its resonant frequency is a function of size, shape and material permittivity.

Traditional mono-modal DRAs were not suitable for wideband application due to their bandwidth limits. The major problem of DRA in comparison to microstrip antenna is its lower gain. Therefore, engineered configurations had been proposed to enhance their gain [3] and bandwidth [4–7].

Drilling off a tunnel in a rectangular DRA reduces the Q-factor and hence improves the impedance bandwidth [8]. Coulibaly et al. achieved broadband using microstrip-fed dielectric resonator antenna for X-band [9]. This antenna suffers from periodic mismatch, particularly at high frequency end. However, the air-gap introduced due to the tunnel adversely affects the resonant frequency and impedance characteristics [10–13], when the volume of the dielectric is low in X-band frequencies and above. Also, air gaps usually produce undesired effects on the antenna characteristic impedance [14]. Use of liquids has been suggested to avoid air-gap losses [15].

Broadband antennas have also been obtained by exploiting the self-similarity property of fractal geometry [16]. Authors have reported preliminary findings of using fractal geometry in DRA [17, 18] for extending the bandwidth. Simulated study on modifying the boundary of rectangular DRA using fractal concept has also been reported for WiMAX application [19].

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An Extensive Review of Webs Caching Techniques to Reduce Cache Pollution

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Abstract – Caching has been used for decades as an effective performance enhancing technique in computer systems. The Least Recently Used (LRU) cache replacement algorithm is a simple and widely used scheme. Proxy caching is a common approach to reduce network traffic and delay in many World Wide Web (WWW) applications. However, some characteristics of WWW workloads make LRU less attractive in proxy caching. In the recent years, several more efficient replacement algorithms have been suggested. But, these advanced algorithms require a lot of knowledge about the workloads and are generally difficult to implement. The main attraction of LRU is its simplicity. In this paper we study several techniques about page replacement, cache pollution and web caching technique at the end of this paper we propose a new idea of web page scheduling.

Keywords: IP, LAN, HTML, Caching, Proxy.

1. INTRODUCTION

Proxy server is placed between a client utility equivalent to a web browser, and a real server the request to the real server. Different key features are improving performance of proxy server like caching the documents and thread polling etc. It provides safety like firewall and security of local Area Network (LAN) from having access to of unauthorized customers. Foremost feature is caching the web documents. Caching refers to store copies of the popular documents in proxy memory and thus used it for future references and reduces the bandwidth requirement. There are different available techniques but this paper is proposing the new and better technique. It blocks all solicitations to the real server to look on the off chance that it might well satisfy the solicitations itself. If not, it forwards unique to improve the performance of Least Recently Used- Distance (LRU-D) of caching the web document in the proxy server. Proxy server is a server (a computer method or a software program) that acts as a middleman for requests from purchasers seeking resources from other servers. A client associates with the proxy server, asking for some supplier, likened to a document, association, net web page or distinctive resource, close by from an alternate server. The proxy server evaluates the request with respect to its filtering rules (Yong Woon 2001). For example, it'll filter traffic with the aid of IP tackle or protocol if the request is validated via the filter, the proxy presents the useful resource via connecting to the vital server and requesting the provider on behalf of the patron. A proxy server may just alternatively adjust the client's request or the server's reaction, and in numerous examples it might serve the demand without reaching the specific server.

A proxy server has many potential purposes, including:

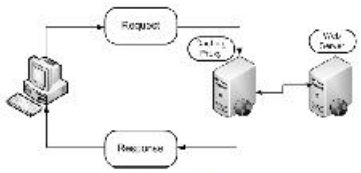

Fig.1 System with caching

(a) To keep machines in the back of it nameless (most of the time for safety)

(b) To pace up access to resources (using caching). Net proxies are often used to cache websites from an online server.

(c) To apply entry policy to network services or content, e.g. to dam undesired websites.

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Challenges and Techniques available to Predict Preterm Delivery and effectiveness of Eletrohysterogram: A Survey

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Abstract :Preterm birth is still the biggest unsolved obstetrical problem. As much as 70% of perinatal mortality is due to prematurity and many of the surviving preterm infants suffer serious lifelong morbidity.The purpose of this study is to propose Eletrohysterogram as a best means to detect preterm delivery . Uterine electrical activity recorded by electrohysterography (EHG) from abdominal electrodes during pregnancy provides trustworthy information about uterine contractions that can detect the onset of preterm delivery.Results from previous author works is taken in support of this study and it can be concluded that Electrohysterogram is indeed a better option than the traditional methods used to predict preterm delivery.

IndexTerms **- Preterm Labor , Gestation, Uterine electrohysterography, Myometrial, Progesterone, antepartum haemorrhage.**

I.INTRODUCTION

Presently, there are about 15 million babies born prematurely in the world among a total of about 150 million births per year. More than 1 in 10 babies are born preterm, affectingfamilies all around the world. Over 1 million children die each year due to complicationsof preterm birth. Many survivors face a lifetime of disability, including learning disabilities and cerebral palsy, intellectual impairment, chronic lung disease ,visualalong withhearing problems and are at greater risk of developing Non Communicable Diseases(NCD) like hypertension, diabetes and other significant healthconditions later in life, creating an intergenerational cycle of risk. They are physically not ready to face the world and often require special care [1]. In a systematic analysis and implications, India was given the highest rank with the highest numbers of preterm births in year 2010 with approximately 1 in 8 babies being preterm.In general most preterm births occur after 32 computed weeks of gestation. More than 90% of babies born before 28 weeks of gestation survive in high income countries but in low-income settings, only 10% of these babies or less survive[2]. Current approaches to prevention and treatment of preterm labor have been shown to be disappointingly unsuccessful[3]. Preterm Labor (PL) defined as labor before completing the 37th week of gestation is the main cause of newborn morbidity and mortality[4].Recent studies show that even babies born at 34–37 weeks have an increased risk of immediate complications[5]. Even after lots of research, we are still unable to diagnose, prevent and treat preterm labor. Checking efficacy of involvements that would allow this is largely influenced by the inability to accurately identify true labor with the currently used crude technology. In the case of progestin treatment for prevention of preterm birth, uterine EMG and cervical LIF are essential tools to obtain the critically needed comparative data on effectiveness of various progestin formulations and their routes of administration in different patients at high risk for preterm delivery .To find an effective prevention and treatment for preterm labor , we must find a method that will allow targeting the treatment only to patients who would, if not treated, really deliver preterm[6]

II.CAUSES OF PRETERM

There are three main reasons for Preterm births. According to P.N. Baker et al. almost one-third are medically indicated or induced delivery is brought forward for the well being of the mother or baby. Another third occurs because the membranes rupture prior to labour called as Preterm premature rupture of membranes (PPROM). The third reason can be, spontaneous contractions (termed preterm labour or TPL)[16].However, there is still a great deal of uncertainty about the level of risk each factor presents, and whether they are causes or effects. Some of the causes of preterm labour, that may or may not lead to preterm birth, have been discussed. These include infection,over-distension,burst blood vessels,surgical procedures ,illnesses and congenital defects of the mother's uterus and cervical weakness[2] These include a previous preterm delivery(20%);the last two births have been preterm (40%), and multiple births(twin pregnancy carries a 50% risk).Other health and lifestyle factors also include cervical and uterine abnormalities, recurrent antepartum haemorrhage, any invasive procedure or surgery ,underweight or obese mother[17]. Following a medical diagnosis of TPL, only 50% of all women with TPL actually deliver within seven days[16] In support of this,

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Internet of Things for Healthcare: A Review

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Abstract

In the current era, there is a requirement of a system with connected devices, persons, time, places and networks, which is completely incorporated in what is called as Internet of Things (IoT). Internet of Things has become the ultimate building blocks in the development of healthcare monitoring system. The aim of an efficient IoT healthcare system is to provide real time remote monitoring of patient health condition, to prevent the critical patient conditions and to improve the quality of life through smart IoT surroundings. New challenges have been introduced with IoT for the security of systems and processes and also with the privacy issues of person's medical data. Information security using IoT is very complicated and difficult; since global connectivity and accessibility is the major concerns related to IoT. Security and privacy by design need to be part of any IoT use case, project or deployment. A number of papers have worked on the access control mechanism with different techniques and with energy efficiency. Few papers have proposed different types of protocols for authentication. A system is required for the fusion of authentication protocol with energy efficient access control mechanism along with the solutions to countermeasure the other attacks in security and privacy of patient healthcare data. After going through the methodology for authentication protocol, for access control and for energy efficient access control mechanism, a combined methodology is proposed to be adopted to pool the gap.

Keywords: *Internet of Things (IoT), Radio-frequency identification (RFID), Wireless body area networks (WBANs), Elliptic curve Diffie–Hellman (ECDH).*

1. Introduction

Traditional methods of providing security cannot be directly implemented in IoT's because of different standards and communication stacks involved. Information and Communication Technologies (ICTs) deployed as part of medical information systems must assure various significant security necessities together with integrity, confidentiality, availability, non-repudiation, authentication, authorization, and accountability so as to secure medical information without affecting the efficiency of services and privacy of patients' data.

Why IoT for healthcare? The major problem that every patient, particularly living in remote locations found was unavailability of doctors and treatment on critical conditions. This had very dreadful consequences on people's mind about the hospitals and doctors services. Nowadays with the implementations of new technologies by making use of IoT devices for healthcare monitoring system, these issues have been sorted to huge extent. IoT has the potential to not only keep patients safe and healthy, but to improve how physicians deliver care as well. Healthcare IoT can also boost patient engagement and satisfaction by allowing patients to spend more time interacting with their doctors. The usage of the Internet of Things (IoT) in healthcare is a vast ecosystem. Within the overall connected healthcare and eHealth picture, more integrated approaches and benefits are

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Detection of Finger-Knuckle-Print Images: A Review

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Abstract

Automated security is one of the major concerns of modern times. Secure and reliable authentication systems are in great demand. A biometric trait like Finger Knuckle Print (FKP) of a person is unique and secure. In the recent years, hand based biometrics is extensively used for personal recognition .Finger Knuckle has unique bending and makes a distinctive biometric identifier. Automatic Knuckle print recognition systems are based on local ridge features known as Minutiae. To select the minutiae points properly and rejecting unwanted ones is very important. The Proposed system shows various methods to implement various aspects of Recognition. There are various filters, Wavelet Transform Methods to implement the Authentication.

Keywords: *Finger Knuckle Print (FKP), Recognition, Minutiae, Authentication.*

1. Introduction:

Swati M R et al. [1] developed Biometric authentication is a process of identifying a person by his/her characteristics or traits. The characteristics/traits which are used to describe a person can be categorized into two groups. Namely physiological characteristics and behavioural characteristics. The behavioural characteristics refer to the behaviour of a person which includes typing rhythm, voice, gait etc and the Physiological characteristic refers to the feature or shape of human body which includes finger print, iris, ear pattern, DNA, palm print, face etc. The recent study shows that prominence of the dorsal aspect of a joint of a finger which is also known as finger knuckle area which consists of highly rich lines and creases are unique and distinct for every individual.

C Hegde et al. [2] suggested the user acceptance for the outer finger surface imaging can be very high as, unlike popular fingerprints, there is no stigma of criminal investigation associated with finger knuckle surface imaging. The peg-free imaging of the finger knuckle surface is highly convenient to users and offers very high potential for reliable personal identification and authentication. The appearance based approach investigated. For the finger knuckle identification cannot exploit line based features and therefore achieves moderate performance. The finger knuckle surface is highly rich in lines and creases, which are rather curved but highly unique for individuals.

2. Steps

2.1 Pre-processing

Swati M Ret al. [1] projected the image present in the PolyU Database contains whole back surface of finger image as shown in figure. In order to concentrate only on the Finger knuckle

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Effect of Tb Doping on Structural and Optical Properties of $(Cd_{0.8}$-$Zn_{0.2})S$ Films Deposited Through a Chemical Route

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Tb-doped $(Cd_{0.8}$-$Zn_{0.2})S$ films have been prepared on glass substrates at 60°C by a chemical bath deposition technique. The effect of variation in the molar concentration of terbium (Tb) on the optical properties of the deposited films has been investigated and is discussed. The films have been characterized through x-ray diffraction (XRD), scanning electron microscopy (SEM), UV–Vis absorption and photoluminescence (PL) emission spectral studies. Prominent diffraction lines of CdS and ZnS with maximum orientation towards $(111)_c$ plane of CdS are observed in XRD patterns. Particle sizes calculated from XRD studies using Scherrer's formula are found to be in the nano-range. The SEM micrographs of bulk film showed a layered structure, while a honey-comb structure with thickness of layers in the nano-range is seen for the deposited films. From the optical absorption spectra, a blue shift in the absorption edge is distinctly observed in the nanocrystalline films as compared to bulk film, suggesting the involvement of a quantum confinement effect. PL emission spectra showed distinct emission peaks for bulk and nanocrystalline films. PL emissions due to transitions within Tb^{3+} levels are also observed. The characteristic green emission peak due to $^5D_4$-$^7F_2$ transition in Tb at 620 nm is observed in all three cases. Various studies suggest that the deposited films have potential applications in photo-electronic devices.

Key words: Nanocrystalline films, chemical bath deposition, effective mass approximation method, photoluminescence, molar concentration

INTRODUCTION

Nanostructured materials have attracted researchers for a long time owing to their fundamental and technological importance.[1,2] Chalcogenide-based semiconductor nanoparticles have proved their domination by offering applications in the field of opto-electronics and related areas.[3–5] (Cd-Zn)S, a ternary chalcogenide semiconductor compound, exhibits a wide band gap between 2.4 eV and 3.7 eV based on the relative Cd:Zn ratio,[6] and is utilized in heterojunction solar cells,[7] low-voltage cathodoluminescence[8] and UV and visible laser diodes.[9] A variety of techniques have been employed for the synthesis of these materials, such as vacuum evaporation, spray pyrolysis, spin-coating,[10] Langmuir–Blodgett,[11] sputtering, molecular beam epitaxy,[12] and chemical bath deposition (CBD). As compared to other available deposition methods, CBD is relatively simple, more rapid, inexpensive and capable of depositing films on large areas.

CBD is one of the solution phase methods useful for the preparation of compound semiconductors from aqueous solutions. It is a method in which a film is deposited on a substrate, usually glass, and dipped in a solution, and is widely used for the deposition of various metal chalcogenide thin films. CBD has been found suitable for large-area

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