SETH GYANIRAM BANSIDHAR PODAR COLLEGE

Podar Educational Campus, Nawalgarh - 333042 (Raj.)

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

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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

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1	Importance of decision making in Business Organization	Pushpendra Singh	Mathematics	Turkish online Journal of Qualitative Inquiry	2021-22	5319-5322	https://www.tojqi.net/index.php/journal/article/view/8938	https://www.tojqi.net/index.php/journal/article/view/8938	
2	Distribution and Roost site selection of Rhinopoma Hardwickii	Dau Lal Bohra and Sarita	Zoology	International Journal of Food, Agriculture and Veterinary Sciences	2021-22	2277-209X	https://iosrjournals.org/iosr-javs.html	Link to article / paper / abstract of the article	
3	Biosorption of lead ions from aqueous solutions by using dead biomass of Bacillus subtilis	Vinamrata Ponia, Seema Bhadauria, Shumailah Ishtiyaq, Harsh Kumar, Vishwajeet Singh	Botany	International Journal of Botany Studies	2021-22	2455-541X	https://www.botanyjournals.com/	https://www.botanyjournals.com/archives/2021/vol6/issue2 file:///C:/Users/dell/Downloads/6-2-72-418.pdf	
4	The significant role and impact of customer relationship management practices in the banks: A customers' satisfaction survey	Dr. Harshit Sharma and Dr. Sanjay Kumar Saini	Commerce	Internationa Journal of research in Marketing Management and sale	2021-22	2663-3337	https://www.marketingjournal.net/	Link to article / paper / abstract of the article	
5	RESHAPING INDIAN ECONOMY POST COVID-19	Dr. Neeraj Basoti Dr. Sanjay Kumar Saini	Commerce	International Journal of Advanced Research in Commerce, Management & Social Science (IJARCMSS)	2021-22	2581-7930	https://portal.issn.org/resource/ISSN/2581-7930	Link to article / paper / abstract of the article	
6	Oestrogen Receptor Alpha, Beta Genes and CYP17A Gene Polymorphism Analysis in Women with Uterine Leiomyoma	Ravindra Goswami, Sukanya Gangopadhyay and Bhaskar Charana Kabi	Botany	Journal of Clinical and Diognostics Research	2021-22	0973-709X	https://jcdr.net/	https://jcdr.net/article_fulltext.asp?issn=0973-709x&year=2021&volume=15&issue=3&page=GC01&issn=0973-709x&id=14612	

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7	A record of electrocution of Egyptian Vulture at Jorbeer, Rajasthan, India	Dau Lal Bohra & Sradha Vyas	Zoology	Bird-o-soar	2021-22		file:///C:/Users/Lenovo/Downloads/7332-Article%20Text-7067-1-10-20211021.pdf	file:///C:/Users/Lenovo/Downloads/7332-Article%20Text-7067-1-10-20211021.pdf	
8	Structural, Elastic, Electronic, Magnetic and Optical Properties of Spin Gapless Semiconducting Heusler Alloy Ti2FeSb Using First-Principles Calculations	Vivek Kumar Jain N. LakshmiRakesh Jain Archana Jain	Physics	Journal of Electronic Materials	2021-22		https://www.springer.com/gp/materials/tms-society?utm_source=springer&utm_medium=banner&utm_content=leaderboard&utm_campaign=CONR_JRNLS_AWA1_GL_MPAS_TMS-IJ_LP	file:///C:/Users/Lenovo/Downloads/s11664-021-09115-z.pdf	
9	Remediation of Cadmium from the Contaminated Aqueous Media by using Dead Biomass of Bacillus subtilis	Vinamrata Ponia, Harsh Kumar, Shumailah Ishtiyaq, Ravindra Goswami and Seema Bhadauria	Botany	Intrnational Journal of Advance Research	2021-22	2320-5407		Link to article / paper / abstract of the article	
10	Analysis of Optimization techniques in Inventory and Supply Chain Management for manufactoring sectors	Pushpendra Singh	Mathematics	**Journal of positive school psychology**	2021-22	5598-5505	https://mail.journalppw.com/index.php/jpsp/index	https://mail.journalppw.com/index.php/jpsp/article/view/3423/2234	
11	Hibernating Ability of Scotophilus Kuhlii by Infared Capacity	Dau Lal Bohra and Sarita	Zoology	International Journal of Geology, Earth And Environmental Sciences	2021-22	2277-2081	https://www.cibtech.org/J-GEOLOGY-EARTH-ENVIRONMENT/PUBLICATIONS/2022/JGEE-12-Contents.htm	https://www.cibtech.org/J-GEOLOGY-EARTH-ENVIRONMENT/PUBLICATIONS/2022/JGEE-DAULAL-2022-DAULAL-HIBERNATING-Scotophilus.pdf	

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12	Sorption of Cadmium Ions Using Inactive Biomass of Pseudomonas fluorescens and Bacillus subtilis Consortium from the Aqueous Solutions	Vinamrata Ponia, Harsh Kumar, Shumailah Ishtiyaq, Ravindra Goswami and Seema Bhadauria	Botany	International Journal of Current Microbiology and Applied Sciences	2021-22	2319-7692	https://www.ijcmas.com/	Link to article / paper / abstract of the article	
13	Remediation of Cadmium from the Contaminated Aqueous Media by using Dead Biomass of Bacillus subtilis	Vinamrata Ponia, Harsh Kumar, Shumailah Ishtiyaq, Ravindra Goswami and Seema Bhadauria	Botany	Intrnational Journal of Advance Research	2021-22	2320-5407	https://www.journalijar.com/	Link to article / paper / abstract of the article	
14	Sorption of Cadmium Ions Using Inactive Biomass of Pseudomonas fluorescens and Bacillus subtilis Consortium from the Aqueous Solutions	Vinamrata Ponia, Harsh Kumar, Shumailah Ishtiyaq, Ravindra Goswami and Seema Bhadauria	Botany	International Journal of Current Microbiology and Applied Sciences	2021-22	2319-7692	https://www.ijcmas.com/	Link to article / paper / abstract of the article	
15	Manav Adhikar evam Polics Prashashan	Vinod Saini	Political Science	Chetna: International Journal of Education	2021-22	2455-8729	http://echetana.com/	Link to article / paper / abstract of the article	
16	Gandhi Darshan	Vinod Saini	Political Science		2021-22				
17	Medicinal and Metabolite compound from Jatropha species	Radheykant Sharma	Chemistry	International Journal of Green and Herbal Chemistry	2021-22				
18	A record of electrocution of Egyptian Vulture at Jorbeer, Rajasthan, India	Dau Lal Bohra & Sradha Vyas	Zoology	Bird-o-soar	2021-22		file:///C:/Users/Lenovo/Downloads/7332-Article%20Text-7067-1-10-20211021.pdf	file:///C:/Users/Lenovo/Downloads/7332-Article%20Text-7067-1-10-20211021.pdf	
19	Evaluation of Atriplex lindleyi Moq. for morpho-physiological and metal accumulation responses under Cd, Ni, and Zn stress	**Harsh Kumar, Shumailah Ishtiyaq, Mayank Varun, Paulo JC Favas, Manoj S Paul**	Botany	International Journal of Botany studies	2020-21	2455-541X	https://www.botanyjournals.com/	file:///I:/_/Harsh%20paper/Research%20paper%20lindleyi.pdf	
20	Structural and electroactive properties of 55 MeV carbon ion beam irradiated polycarbonate films	B.S, Rathore, Sandeep Sharma and S.S. Rathore	Physics	AIP Conference Proceedings	2020-21	0094-243X	https://aip.scitation.org/doi/10.1063/5.0001396	Link to article / paper / abstract of the article	

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21	Stability and electronic properties of ZnSe nanowires: An ab initio approach	Sanjay Prakash Kaushik, Satyendra Singh, Ram-Krishna Thakur	Physics	NANOSYSTEMS: PHYSICS, CHEMISTRY, MATHEMATICS	2020-21		https://DOI.org/10.17586/2220-8054-2020-11-5-546-552	Link to article / paper / abstract of the article	
22	Ab Initio Study of Electronic Properties of Cadmium Sulphide Nanowires	Satyendra Singh, Sanjay Prakash Kaushik, Supreet	Physics	Journal of Computational and Theoretical Nanoscience	2020-21		https://doi.org/10.1166/jctn.2020.8907	Link to article / paper / abstract of the article	
23	Taxonomic Identification of Plants Growing on and biodeterioration Buildings of Cultural Heritage Importance in Manipur	Seema Bhadauria and Ravindra Goswami	Botany	International journal of multidisciplinary Research In Science, Engineering and Technology	2020-21	2582-7219	http://ijmrset.com/	http://ijmrset.com/upload/2020/november/1_ppr_revised_NEW.PDF	
24	Taxonomic identification of micro - organisms growing on and cause Biodeterioration of cultura Heritage of Agra and Mathura region	Anuradha Chauhan, Ravindra Goswmai and Seema Bhadauria	Botany	International journal of trend in scientific research and development	2020-21	2456-6470	https://www.ijtsrd.com/	https://www.ijtsrd.com/biological-science/botany/38238/taxonomic-identification-of-microorganisms-growing-on-and-cause-biodeterioration-of-cultural-heritage-of-agra-and-mathura-region/dr-anuradha-chauhan	
25	Fungal Biodeterioration of Documentary Heritage (Manuscript) and Their Conservation through Traditional way of Conservation with special reference to Ppaer and Palm Leaf manuscripts	Ravindra Goswami and Seema Bhadauria	Botany	International Journal of Enhanced Research in Science, Technology & Engineering	2020-21	2310-7463	http://erpublications.com/our-journals-dtl.php?pid=1	http://rfppl.co.in/subscription/upload_pdf/Ravindra%20Goswami_6976.pdf	
26	Fault Analysis of Electric Power System using PLC and Wireless Communication System	Uma Soni	Computer Science	International Journal of Engineering and Advanced Technology (IJEAT)	2020-21	2249-8958	https://www.ijeat.org/	Link to article / paper / abstract of the article	
27	Wireless Smart Metering and Monitoring System for Household Power Theft	Uma Soni	Computer Science	International Journal of Advanced Science and Technology	2020-21	10753-10776		Link to article / paper / abstract of the article	

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28	Role of District Central Co-operative Banks Credit in Farming and Non-Farming Sector	Dr. Sanjay Kumar Saini	Commerce	Alochana Chakra Journal	2020-21	2231-3990	https://journal.iferp.in/international-journal-advanced-science-technology.php	Link to article / paper / abstract of the article	
29	On Unifieed Subclassof Univalent function of Complex order using the Frasin Operation	Vidhyadhar Sharma & Nisha Mathur	Mathematics	International Journal of Mathematics trends and Technology	2020-21	2231-5373	https://www.ijmttjournal.org/	Link to article / paper / abstract of the article	
30	A Study of Distortion Theorem and Inclusion relation for a new Class of Meromorphic Function	Vidhyadhar Sharma & Nisha Mathur	Mathematics	IOSR Journal od Mathematics	2019-20	2278-5728		Link to article / paper / abstract of the article	
31	Electronic Structure, Elastic, Magnetic, and Optical Properties of Fe 2 Mn Z (Z= Si, Ge, and Sn) Full Heusler Alloys: First-Principle Calculations	Vivek Kumar Jain, N Lakshmi, Rakesh Jain, Aarti Rani Chandra	Physics	Journal of Superconductivity and Novel Magnetism	2019-20		https://doi.org/10.1007/s10948-018-4751-3	Link to article / paper / abstract of the article	
32	Electronic structure, magnetic and optical properties of Co2TiZ (Z= B, Al, Ga, In) Heusler alloys	Rakesh Jain, N Lakshmi, Vivek Kumar Jain, Vishal Jain, Aarti R Chandra, K Venugopalan	Physics	Journal of Magnetism and Magnetic Materials	2018-19		https://journals.elsevier.com/journal-of-magnetism-and-magnetic-materials	Link to article / paper / abstract of the article	
33	CERTAIN RESULTS ON SUBCLASSES OF BI - UNIVALENT FUNCTIONS ASSOCIATED WITH HOHLOV OPERATOR	Vidhyadhar Sharma & Nisha Mathur	Mathematics	INTERNATIONAL JOURNAL OF EMERGING TECHNOLOGY AND ADVANCED ENGINEERING	2018-19	2250-2459	https://www.ijetae.com/	Link to article / paper / abstract of the article	
34	Photocatalytic Performance of ZnSe-rGO Nanocomposites synthesis, Characterization and Composition Dependence	Anil Yadav, S.P. Mehra and Dinesh Patidar	Physics	Journal of Nanosciences and Nanotechnology	2018-19	5256-5263	http://www.aspbs.com/jnn/	Link to article / paper / abstract of the article	
35	A Study of Distortion Theorem and Inclusion relation for a new Class of Meromorphic Function	Vidhyadhar Sharma & Nisha Mathur	Mathematics	IOSR Journal od Mathematics	2018-19	2278-5728		Link to article / paper / abstract of the article	

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36	Electronic Structure, Elastic, Magnetic, and Optical Properties of Fe 2 Mn Z (Z= Si, Ge, and Sn) Full Heusler Alloys: First-Principle Calculations	Vivek Kumar Jain, N Lakshmi, Rakesh Jain, Aarti Rani Chandra	Physics	Journal of Superconductivity and Novel Magnetism	2018-19		https://doi.org/10.1007/s10948-018-4751-3	Link to article / paper / abstract of the article	
37	Awareness about Cultural Heritag: A Key to Sustainable Tourism	Ravindra Goswami	Botany	Journal of Tourism and Hospitality	2018-19	2250-0562	offline		
38	Saan Art:: Reflection of Cultural Heritage of Rajathan Need to be Preserved	Ravindra Goswami	Botany	Journal of Tourism and Hospitality	2018-19	2250-0563	offline		
39	MINERAL RESOURCES IN RAJASTHAN: THEIR DEPOSITS AND PRESENT POSITION IN ECONOMY OF STATE	Dr. SANJAY KUMAR SAINI	B.Adm	INSPIRA	2017-18	2231-167X	https://inspira.un.org/psp/PUNA1J/?cmd=login&languageCd=ENG&	Link to article / paper / abstract of the article	
40	CHARACTERISTIC PROPERTIES OF SUBCLASSES FOR THE MEROMORPHICALLY MULTIVALENT FUNCTIONS	VIDYADHAR SHARMA	Mathematics	IOSR JOURNAL OF ENGINEERING (IOSRJEN)	2017-18	2250-3021	http://www.iosrjen.org/	Link to article / paper / abstract of the article	
41	Quantitavie Analysis of Flouride in Ground Water in Nawalgarh, Jhunjhunu (Rajasthan)	K.C. Agarwal, Dau Lal Bohra and Maha Singh	Zoology	Journal of Innovative Research in Clinical and Medical Sciences	2017-18	2456-7736	http://ijircms.com	http://ijircms.com/wp-content/uploads/2020/12/ICPLS-2018-2-1-4-Agarwal-sir.pdf	
42	SOME INCLUSION RELATIONS ASSOCIATED WITH GENERALIZED FRACTIONAL INTEGRAL OPERATOR	Vidhyadhar Sharma	Mathametics	JFCA	2017-18		http://math-frac.org/Journals/JFCA/default.php	Link to article / paper / abstract of the article	

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43	The Effect of Co2 Laser cutting parameter on Mechanical and microstructural characteristics of High Strength Steel-a review	Dinesh patidar and R.S. Rana	Physics	Science Direct	2017-18	2214-7853	https://service.elsevier.com/app/home/supporthub/sciencedirect/	Link to article / paper / abstract of the article	
44	Study of the Electronic Structure, Magnetic and Elastic Properties and Half-Metallic Stability on Variation of Lattice Constants for CoFeCr Z (Z= P, As, Sb) Heusler Alloys	Rakesh Jain, Vivek Kumar Jain, Aarti R Chandra, Vishal Jain, N Lakshmi	Physics	Journal of Superconductivity and Novel Magnetism	2017-18		https://doi.org/10.1007/s10948-017-4460-3	Link to article / paper / abstract of the article	
45	Resource Contraints in Economic Development of India	Sanjay Kumar Saini	Commerce	AMIERJ	2017-18	2278-5655	http://amierj.weebly.com/	Link to article / paper / abstract of the article	
46	Electronic structure properties of new equiatomic CoCuMnZ (Z= In, Sn, Sb) quaternary Heusler alloys: an ab-initio study	Aarti R Chandra, Vishal Jain, N Lakshmi, Vivek Kumar Jain, Kumavat Soni, Rakesh Jain	Physics	Journal of Alloys and Compounds	2017-18		https://doi.org/10.1016/j.jallcom.2018.03.143	Link to article / paper / abstract of the article	
47	Stability of half-metallic behavior with lattice variation for Fe2MnZ (Z = Si, Ge, Sn) Heusler alloy	Vivek Kumar Jain, N Lakshmi, Rakesh Jain	Physics	AIP Conference Proceedings	2017-18		https://doi.org/10.1063/1.5033032	Link to article / paper / abstract of the article	
48	Study of the electronic structure properties in Co2NbIn/Sn Heusler alloys	Aarti R Chandra, Vishal Jain, N Lakshmi, Rakesh Jain, Vivek Kumar Jain	Physics	AIP Conference Proceedings	2017-18		https://doi.org/10.1063/1.5028952	Link to article / paper / abstract of the article	
49	Stability of half-metallic behavior with lattice variation for Fe2-xCoxMnAl Heusler alloy	Vivek Kumar Jain, N Lakshmi, Rakesh Jain	Physics	AIP Conference Proceedings	2017-18		https://doi.org/10.1063/1.5028925	Link to article / paper / abstract of the article	
50	First principles investigations of Fe2CrSi Heusler alloys by substitution of Co at Fe site	Rakesh Jain, N Lakshmi, Vivek Kumar Jain, Aarti R Chandra	Physics	AIP Conference Proceedings	2017-18		https://doi.org/10.1063/1.5028926	Link to article / paper / abstract of the article	

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51	Spin polarization in Co2CrAl/GaAs 2D-slabs: A computational study	Aarti R Chandra, Vishal Jain, N Lakshmi, Vivek Kumar Jain, Rakesh Jain, K Venugopalan	Physics	Journal of Magnetism and Magnetic Materials	2017-18		https://doi.org/10.1016/j.jmmm.2017.07.056	Link to article / paper / abstract of the article	
52	Synthesis, Characterization and optical Properties of ZnSe Nanoparticles	Anil Yadav, S.P. Mehra and Dinesh Patidar	Physics	International Journal of Applied Engineering Research	2017-18	0973-4562	https://www.ripublication.com/ijaer.htm	Link to article / paper / abstract of the article	
53	Structural and Thermal properties of ion beam irradiated polystyrene/ZnO nanocomposite films.	B.S. Rathore, K. C. Agrawal and A. K. Chauhan	Physics	International Journal of Advanced Research in Engineering & Technology	2017-18	2456-7841	http://sijiret.com/wp-content/uploads/2018/04/2.1.1-ICET.pdf	Link to article / paper / abstract of the article	
54	Biodeterioration of Cultural He	Ravindra Goswami, Anuradha Chauhan and Neha	Botany	Indian Journal of Biology	2017-18	2394-1391.	http://rfppl.co.in/abo	http://rfppl.co.in/subscription/upload_pdf/Ravindra%20Goswami_6976.pdf	
55	Prevention of Power Theft Usir	Uma Soni	Computer Science	International Journal of Computer Sciences and Engineering	2017-18	2347-2693	https://www.ijcseonl	Link to article / paper / abstract of the article	
56	Electronic structure, magnetic and optical properties of Co2TiZ (Z= B, Al, Ga, In) Heusler alloys	Rakesh Jain, N Lakshmi, Vivek Kumar Jain, Vishal Jain, Aarti R Chandra, K Venugopalan	Physics	Journal of Magnetism and Magnetic Materials	2017-18		https://journals.elsevier.com/journal-of-magnetism-and-magnetic-materials	Link to article / paper / abstract of the article	
57	CERTAIN RESULTS ON SUBCLASSES OF BI - UNIVALENT FUNCTIONS ASSOCIATED WITH HOHLOV OPERATOR	Vidhyadhar Sharma & Nisha Mathur	Mathematics	INTERNATIONAL JOURNAL OF EMERGING TECHNOLOGY AND ADVANCED ENGINEERING	2017-18	2250-2459	https://www.ijetae.com/	Link to article / paper / abstract of the article	
58	Photocatalytic Performance of ZnSe-rGO Nanocomposites synthesis, Characterization and Composition Dependence	Anil Yadav, S.P. Mehra and Dinesh Patidar	Physics	Journal of Nanosciences and Nanotechnology	2017-18	5256-5263	http://www.aspbs.com/jnn/	Link to article / paper / abstract of the article	

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Importance of Decision Making in Business Organization

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Abstract

The success of any business venture to a large extent, depends on the right decision. The right decision may bring success for the business venture and a bad decision may bring doom for it. So a good manager/leader must have the ability to take the right decision. This work-study attempts to identify and joint all parts of decision making and its development with the right decision policies in business industries. Without effective decision making many steps like planning, scheduling, controlling can't be completed any task completely. Management decisions are those decisions that make a choice of one option among two or three options. The purpose of decision-making is to commit to the business organization and represents a choice.

Keywords: Decision Making, Right decision, Business organization, Management.

Introduction

Decision-making means arriving at a decision. It means making a decision about what to do and when to do it. It means choosing the right action and choosing the right time for the action. Here comes the question of priorities which work is to give preference over others, in a business organization one has to decide which production is comparatively less expensive and greater profit earner. Selection by the manager of any decision is partly arbitrary case but how to execute this decision and action behind that and what is the output it's the main issue. Malik et al. (2016) examined the study of the importance of operation research and its decision approach in higher education.

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Research Article

DISTRIBUTION AND ROOST SITE SELECTION OF RHINOPOMA HARDWICKII GRAY, 1831 OF *RHINOPOMA HARDWICKII* IN JHUNJHUNU, RAJASTHAN, INDIA

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[1]P. G. Department of Zoology, Seth Gyaniram Bansidhar Podar College, Nawalgarh 333042, Jhunjhunu, Rajasthan
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ABSTRACT
Present study on habitat uniqueness of *Rhinopoma hardwickii* was conducted in Jhunjhunu district Rajasthan for a period of one year extending from May 2019 to July 2020. A bat roost of R. hardwickii was observed in urban areas 27° 38' and 28° 31' North scopes and 75° 02' and 76° 06' East longitudes, having more than 270 bats roosting sites in 6 block levels. This paper will help in document new information concerning habitats and amount of *R. hardwickii* in Jhunjhunu and will add new distribution map to the bats of central Rajasthan.

Keywords: *Rhinopoma hardwickii, Roost Site, Thar Desert*

INTRODUCTION
The Thar Desert in Rajasthan occupies only 6% of the total land area of the country. Within this small area, with hostile climates, about 15.8% (68 of 428) species of mammals are still alive. Agarwal (1998) reported 13 orders, 42 families, 180 Genera and 390 species of mammals in India Rajasthan. Thar, as a natural environment, is undergoing a process of evolution. The Shekhawati region is relatively rich in carnivores and a variety of mammals compared to other Thar Desert regions. The main reasons for the poor diversity of these species are human population growth, rapid environmental deprivation, industrial development, illegal mining, irrigation, deforestation and poaching. Unrestrained mines in the Aravalli Mountains and other small clocks in the Jhunjhunu district also affect biodiversity. Altering the composition of flowers will definitely affect the composition of the region's animals. Many mesic species of small mammals increase their distribution near Thar (Parkash, 1995; Bohra, 2011). Bats are the second most species rich request of mammals, with extraordinary natural variety, particularly in the jungles. They embrace a scope of biological system administrations, including seed dispersal, fertilization and bug control. An assortment of biologically and economically significant plants depends on bats somewhat as pollinators or seed dispersers (Kunz *et al.,* 2011). Bats are additionally progressively utilized as bio indicators to evaluate the biodiversity capability of regions and screen ecological changes, and there is along these lines a requirement for dependable techniques for concentrating on bat collections.
In this study we assess the bats species in Jhunjhunu district and study the habits and habitat, roosting and foraging behavior of different bats species and including this we also formulation base line data of *Rhinopoma hardwickii* in Jhunjhunu Rajasthan. Beside this study we will also study the habits and habitat, roosting and foraging behavior of different bats species and formulation base line data of chiropterans in center part of Rajasthan.

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Biosorption of lead ions from aqueous solutions by using dead biomass of *Bacillus subtilis*

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[2] Department of Botany, St John's College, Agra, Uttar Pradesh, India
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Abstract
Exaggeration of heavy metal toxicants in aquatic systems arises as an alarming situation and emanating as a serious threat to all life forms. This study examines the potential of *Bacillus subtilis* biomass for Lead metal ions biosorption from contaminated aqueous media. Biosorption efficiency was determined in batch experiments and the metal concentration was analyzed by using (Atomic Absorption Spectrometry). The favorable optimum conditions for maximum removal (83.46 %) of Lead ions from 100 ml solution were obtained at pH 6, biomass dosage of 3 mg/ml, temperature 30^{0}C and 20 mg/L of lead concentration at 80 minutes of contact time. The models Langmuir and Freundlich isotherm were determined for Lead metal ions adsorption by *Bacillus subtilis*. The adsorption experimental data was best fitted for Langmuir model (R^2 = 0.99892). The result indicates that *Bacillus subtilis* emerging as an efficient sorbent for the remediation of Lead metal ions from aquatic environments.

Keywords: heavy metal, *Bacillus subtilis*, biosorption, biosorbent, aquatic environments

Introduction

Heavy metals are highly toxic and persistent environmental pollutants that lead to the contamination of several aquatic systems. Due to their bio accumulative nature, mobilization of these toxicants has been increased in the atmosphere and may cause disturbance in their biogeochemical cycles and consequently pollute the food chains. "Heavy Metal" are those metallic elements that has comparatively high density and can be toxic even at very less concentrations. Heavy metals cannot be degraded or destroyed (Lenntech, 2004) [1]. Heavy metal is a common term which implements to the group of metals having atomic density more than 4 g/cm^3, or 5 times higher than water (Hutton and Symon, 1986) [2]. These inorganic pollutants introduced in the environment mainly by natural sources which include weathering of rocks and volcanic eruptions, and other human-induced sources, which involve mostly agricultural and industrial activities. Most hazardous environmentally relevant heavy metals and metalloids include Cr, Cu, Zn, Ni, Cd, Hg and Pb which are considered as detrimental and silent killers. Prolonged exposure of these metals shows deleterious effects on human beings. Heavy metal contaminated aquatic ecosystems are emerging as a major environmental problem and a matter of public health concern that needs to be resolved in order to meet the forthcoming demands.

Several methods have been developed for the rectification of metal ions from aqueous matrix such as chemical precipitation, filtration, chemical oxidation-reduction, ion exchange, reverse osmosis (Xia and Liyuan, 2002) [3]. However, several problems may arise by using these conventional methods such as uncertain metal ions expulsion, generation of toxic sludge, difficulty in its removal and demolition (Addour *et al.*, 1999) [4].

Consequently, there is a need to explore alternative biological techniques for the remediation and recovery of toxic metal ions from polluted sites and should be able to meet the permissible exposure limits. Biological treatment, considered as a dependable alternative method for the removal of the toxic ions because of its environment friendly an economical nature with a number of other benefits like less dependency on chemicals, immense selectivity and efficiency to remove the toxic metal ions (Matagi *et al.*, 1998; Chevalier *et al.*, 2000; Mehta and Gaur, 2005) [5, 6, 7].

Bioremediation method basically depends on the use of microorganisms which can efficiently expel toxicants and poisonous heavy metals from contaminated sites. Generally, biological treatment can be done by two different methods- bioaccumulation (an active process) and biosorption (involves passive process) to remediate pollutants from contaminated matrix (Churchill *et al.*, 1995; Davis *et al.*, 2003) [8, 9]. Biosorption is the process which includes inactive dead biomass of microorganisms for the removal of toxic ions from an aqueous medium by binding biomass passively. Cell wall of non-living microbial biomass is usually used for the process of biosorption of heavy metals (Churchill *et al.*, 1995) [8]. Sorption treatment basically involves two phases- Solid phase (contains biomass of selective organisms) and Liquid phase (consists of pollutants like heavy metal ions) (Farooq *et al.*, 2010) [10]. Biomass (sorbent) and metal ions (sorbate) mutually showed pronounced affinity for each other which facilitate the attachment or binding of sorbate to sorbent in a passively directed process (Das *et al.*, 2008) [11]

Several types of organisms like fungi, bacteria, algae and plants are extensively used for biosorption processes (Aksu and Balibek, 2006) [12]. The potential of these organisms for removal of heavy metal ions, or to promote transformation to less toxic forms is receiving attention worldwide, from last few decades. Among all these organisms, bacterial biomass is one of the most potential choice for the removal of heavy metals from aqueous

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The significant role and impact of customer relationship management practices in the banks: A customers' satisfaction survey

Dr. Harshit Sharma and Dr. Sanjay Kumar Saini

Abstract
This paper was designed to explore the background of banking and retail consumer relations. It also aims at evaluating the impact on customer loyalty of customer relationship management. Five consumer interaction dimensions have been identified: Loyalty, Capacity, Special Consideration, Conflict Management and Ease. The customer's satisfaction with bank is influenced only by faith, special treatment and ease. This research will assist bank officials in implementing a proper client relationship management strategy.

Keywords: customer relationship, loyalty, capacity, special consideration, conflict management, satisfaction survey

1. Introduction

Customer Relationship Management (CRM) is the term for handling the conations between consumers, employees and all business and financial activity challenges of the enterprise. The systems used to control and promote the corporate operations and events of the company. CRM is then used instead of as a technological challenge as a practical enterprise and operation. In addition, the long-term objective of CRM is to increase consistency and to enhance the user experience that can contribute to consumer loyalty. In order to implement CRM effectively, the top management framework dedication and vision are strongly recommended and needed. The strategic structure's policies should be flexible and particularly the pricing policies should be clear. These problems are essential to improving customer loyalty and market advantages. There is a time of unprecedented transition in the banking sector in the world. Owing to the turbulence, several banks follow many marketing partnership tactics to obtain a competitive edge. Marketing partnerships seek to build, retain and enhance client relationships and other stakeholders in order to preserve and boost the customer base and profitability of a company. Marketing partnership literature is ample, particularly in the sector of banking. Several reports also stated the successful application of CRM benefits for organizations. Consumers who have a positive friendship with and offer a greater sense of loyalty and desire to remain mutually beneficial. In addition, consumer satisfaction was increased and the promotion costs decreased, since loyal consumers became less costly to service. In general, anything that happens in the global economy has been to a certain extent influenced by all companies and especially financial institutions. Today, the companies are not only seeking to please their clients, but they are attempting to do so more successfully than their opponents on the global market to accomplish their targets. In their corporate and communications strategy, an organization's primary priority is to keep clients happy and concentrate on customer focus. An organization's most critical task is to maximize customer loyalty and emphasis on in their operational and communication methods, consumer oriented strategy. While pleased consumers are like free publicity for financial institutions, the meaning cannot be discounted. In line with their plans, activities and procedures, you can place your customer at the core of your business. Indeed, marketing to current clients is faster and more lucrative than attracting new ones.

2. Review of Literature

Various researches on the advantages of customer relations management have been published. Marketing principles for connections [1], marketing customer care and satisfaction [2], reciprocal confidence growth [3, 6] and partnership management principles [7].

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RESHAPING INDIAN ECONOMY POST COVID-19

Dr. Neeraj Basotia*
Dr. Sanjay Kumar Saini**

ABSTRACT

In the beginning of the year marks the spread of the disease COVID-19, which not only causes the loss of lakhs of people all around the world, but also affected all the sectors of business as well as service industry. Millions of people are jobless and various businesses either shutdown or get affected very badly. In such a situation, it is required to reform the various financial policies and required some new programs and grants by government, so that the dying economy will get some oxygen.

Keywords: *Cyber Security, Cyber Crime, Hacking, Hackers.*

Introduction

With the arrival of the COVID-19, all the business get affected , it started from all May 2020, as the footfall of customers extremely reduced due to the lockdown. During that period, as per the studies and survey conducted the footfall, reduced to the extremely low rate up to 5.4%, which is quite the lowest as compared to the data which is available for that period for the last 14-15 years. The main reason which was being highlighted for the reduced footfall, was the uncertainty about what was going to happen, how long all this will go, so the people buy goods during that period in the very limited amount.

According to the figures and data which was presented by IHS PMI (Purchasing Managers Index) , the data shows the declines in sales. PMI also indicates that due to lockdowns, the people are not able to move from one place to another, as the result of which labors shortage occurs, which results in the reduction of the production of goods and commodities. On the other hands due to import restrictions, the raw materials scarcity also occurred. During the period of mid of 2020, various business results in closers or just surviving. The business experiencing various problems , which includes the difficulty in maintaining the supply chain , difficulties in paying up the bills, difficulty in paying up the Loan EMIs etc.. In such a situations, small businesses, shattered badly. The Composite PMI index states that such a situation rarely or never seen in the history and these situations get more worsened when the COVID-19 reaches its peak.

Various Industries like automobile , mobile companies , FMCG has downsized their productions due to such reasons , which further adds the complications to the situations, the results of such downsizing was that number of labors lost their jobs. Even , in the current situation of the 2021 , the downsizing is still continued as the various businesses which depends upon exports also , facing the low demands from the foreign clients , results of which they lowered the production. However, the main driver of constant business disturbance gives no indication of subsiding as the Covid passing's on the planet's second-most crowded nation rose past 1,00,000, just the third country on the planet to arrive at that grim achievement, after the US and Brazil. The services area represents around 55% of the nation's economy and almost 33% of its positions.

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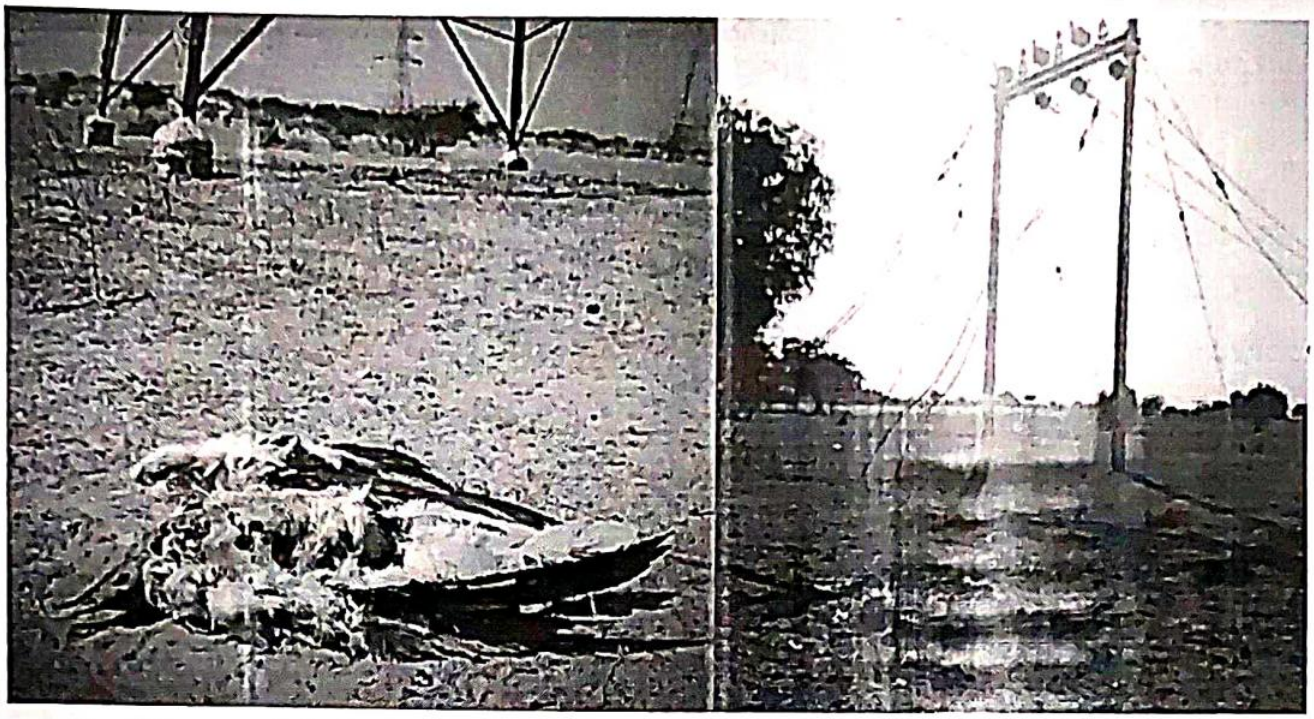

Egyptian Vulture mortality by power lines.

the MoEFCC, Government of India to prevent them from becoming a threatened species. Their population is declining rapidly. From last five years (2015–2019), 129 electrocution cases of the Egyptian Vultures in winter have been reported (Table 1). Highest mortality of *Neophron percnopterus* was reported in the year 2017. Average percentage of power line death is 1.46 in the last five years. The main threats to Egyptian Vultures are direct mortality caused by humans by electrocution, decrease accessibility of food, and habitat destruction.

The current report describes a single case of the rescue and rehabilitation after electrocution. On 10 May 2020, around 1310 hours, we found one more, one year old Egyptian Vulture at Shivbari Rural (27.989N, 73.365E), near Jorbeer Conservation Reserve, Bikaner, Rajasthan. It was incapacitated to fly due to wing injury. It was rescued for necessary treatment and rehabilitation. The Egyptian Vulture was depressed and unfit to fly due to electric shock with skin burn and wing bone damage. It was submitted to the local forest department.

The veterinarian provided treatment of Amoxicillin as an antibiotic and Meloxicam as pain killer drug along with dressing the wounds. An efficient way of avoiding such incidents is to deploy specially designed insulators on poles. Bikaner's Jorbeer is an unusual feeding destination for vultures in Asia (largest vultures' site). There are many dangers with food including electrocution, drugs, pesticides, and Feral dogs. Government of India should take care of every migratory vulture here and reduce the death rate.

This report highlights the urgent need to plan and retro-fit power lines in India with non

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ORIGINAL RESEARCH ARTICLE

Structural, Elastic, Electronic, Magnetic and Optical Properties of Spin Gapless Semiconducting Heusler Alloy Ti_2FeSb Using First-Principles Calculations

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Abstract

Density functional theory has been used to study the structural, elastic, electronic, magnetic and optical properties of Ti_2FeSb Heusler alloy using generalised gradient approximation implemented through the WIEN2k code. The cubic structure of Ti_2FeSb is mechanically stable in the F-43m space group and shows elastic anisotropic properties with ductile nature. Ti_2FeSb shows spin gapless semiconductor behaviour along with an indirect energy band gap (E_G) of 0.10 eV along the Γ-X in majority spin (γ-spin) band above the Fermi energy level (E_F) and 0.90 eV in the minority spin (δ-spin) band at E_F. The total magnetic moment is 3 μ_B at optimized lattice constant (a_o) 6.32 Å and follows the Slater–Pauling curve for inverse Heusler alloys. Robustness of this material with respect to change in the value of a_o is evident in the constancy of magnetic moment along with retention of the half metallic nature within a lattice variation ±4% from equilibrium value of a_o. Reflectivity, optical conductivity, dielectric function, absorption coefficient and energy loss have also been investigated as a function of incident energy for this alloy.

Keywords Electronic properties · half metallic ferromagnetism · spin gapless semiconductors · magnetic moment · spin polarization · optical conductivity

Introduction

In spin gapless semiconductors (*SGS*), one spin has zero energy band gap (E_G) while the other spin has a wide value of E_G near the Fermi Energy Level (E_F) and were predicted to act as dilute magnetic semiconductors. On acquiring a small amount of energy, electrons and holes in *SGS* type materials can go from the valence band to conduction band to achieve 100% spin polarization (*SP*) at the E_F.[1–3] In comparison to ordinary semiconductors, *SGS* can achieve larger electron mobility.[4] Full and quaternary Heusler alloys are promising *SGS* materials and most half-metallic ferromagnetic (*HMF*) Heusler alloys that theoretically possess 100% value of *SP*.[5–12] This, along with high values of magnetic moment and Curie temperatures make them excellent for applications in devices based on spin valves, magnetic tunnel junctions (*MTJ*), spin random access memory (*SRAM*), as heads in magnetic hard disk drives, spin transfer torque, etc.[13–15] These desirable characteristics have been reported in several Ti based Heusler alloys such as Ti_2CoSi, Ti_2VAs, Ti_2MnSb and Ti_2FeAl which were theoretically established to be *SGS*.[16–18] The Ti based Heusler alloys in the form of Ti_2YZ (Y= Ni, Co, Fe, and Z = In, Ga, Al) and Ti_2FeSn in particular, have been observed to be *HMF* through calculations of band structure. Ti based Heusler alloys mostly stabilize with the structure of inverse type Heusler alloys in which both Ti atoms are in adjacent positions.[19,20] Magnetic and half-metallic properties are reported to change with lattice distortion as, for example, in the case of Ti_2VZ (Z = Sn, Ge, Si).[21] Elastic properties of materials is an indication of the binding nature of nearby planes of atoms in a given crystal structure as well as indicate the ease of mechanical deformation and anisotropic character and play a prominent role in the necessary information about structural stability of materials. Various essential thermodynamic characteristics of

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RESEARCH ARTICLE

REMEDIATION OF CADMIUM IONS FROM THE CONTAMINATED AQUEOUS MEDIA BY USING DEAD BIOMASS OF*BACILLUS SUBTILIS*

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Heavy Metal, *Bacillus subtilis*, Biosorption, Biosorbent, Aquatic Solutions

Abstract

Aquatic systems are severely polluted by heavy metal pollutants which results in worsening the quality of water which arises as a serious threat that needs to cope up by the world. These toxicants show detrimental effects on all life forms which leads to disturbance of the ecosystems. Therefore, there is a vital need to clean the polluted environment by developing new innovative approaches for the remediation of water systems. In the current study,batch experiments were performed to check the potential of biosorbent*Bacillus subtilis*for the biosorption of cadmium metal ions from contaminated aqueousmedia and the favorable environment for the highest removal (87.50 %) of cadmium ions were obtained after 60 minutes of equilibrium time at pH 5, 0.2 g biomass and 20 mg/L of cadmium concentration. The experimental adsorption data were better fitted towards the Langmuir model for Cd (R^2 = 0.9938)than the Freundlich model, while the data related to chemical kinetics obtained by pseudo first and second order equations. The maximum biosorption capacity achieved by*Bacillus subtilis* for cadmium metal was found 51.8 mg/g. Hence, this study suggested that *Bacillus subtilis* proved to be an effective biosorbent for the mitigation of cadmium ions from aquatic solutions.

Introduction:-

Pollution caused by heavy metal ions in aquatic ecosystems arises as an alarming situation for the whole world. Over the years, overexploitation of water has been elevated immensely due to industrialization, urbanization and incessant rise of the population which cause uncontrolled discharge of toxic pollutants in natural water bodies. These heavy metal ions lead to deterioration and contamination of the environment and also show detrimental effects on the health of humans and other life forms. "Heavy Metals" are the natural metallic elements that have remarkably high density and they cannot be degenerated due to their tenacious and persistent nature and are found toxic even at very low concentrations (Lenntech, 2004). Heavy metals namely cadmium, arsenic, chromium and lead are released into the environment during mining, smelting and other industrial processes. Cadmium is considered a highly toxic and carcinogenic metal and the major sources of its discharge are painting paper, fuels, photographic materials and electroplating industries (Gupta et al.,2004). In order to make the environment healthier for living beings, contaminated water bodies need to be rectified by developing new approaches for the remediation of wastewater. Several conventional methods are available to expel metallic ions from aquatic solutions namely chemical

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ANALYSIS OF OPTIMIZATION TECHNIQUES IN INVENTORY AND SUPPLY CHAIN MANAGEMENT FOR MANUFACTURING SECTORS

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Abstract

Regulation and control of inventories are one of the most significant areas of supply chain control. In real-life circumstances, it becomes more and more relevant for businesses. Problems with the inventory are popular in production, remanufacturing, repair and company processes, and many other important applications. An optimization model for the inventory management of distribution undertakings has been developed with the intention of reducing the overall total cost in production method unit time. In this work, we will classify these methods (or models of optimization) into many forms with detailed information that is more useful for inventory researchers to find the right method to solve the EOQ system. Notice that Ford Whitman Harris implemented the method for the first quantity of economic order (EOQ). Many researchers and scientists have so far tried to improve and expand the first version to conform to real-world conditions, especially for manufacturing and supply chain administration. Throughout an imprecise market and manufacturing climate, these attempts created by scholars in the preceding century may be included in the inventory method. Fuzzy set theory / neural network/ artificial neural network has also been effectively combined with EOQ models in the existing set theory. This combination allows process and objective functions more complicated and has a complex structure and involves a strong optimization system. Hence, this article provides complete literature about EOQ and its extensions made by researchers in detail providing several issues, challenges, and future research direction with respect to respective optimization models.

Keywords: Supply Chain Management; Fuzzy; Inventory; Manufacturing; Optimization Algorithm.

1. INTRODUCTION

Today due to recent development in technology, industries are looking forward to increasing their productivity by maintaining information as inventory for a long time. But, some useful mechanisms are used to discuss with respect to various inventory models for manufacturing sectors. Note that manufacturing sectors belong to many sectors like the automobile, pharmaceutical sector, etc. The technology zone specializes in motor automobile design, production, manufacturing, marketing, and income activities. The automobile zone is slowly turning into the fabric industry's cyanosis inside the world. In financial progress, the massive increase has additionally been located for the hobby and fee of the automobile industry. Goods

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Research Article

HIBERNATING ABILITY OF *SCOTOPHILUS KUHLII* BY INFRARED CAPACITY

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ABSTRACT
In Indian continent, about 13 orders, 42 families, 180 Genera and 390 species of mammals are present. Of these, 8 orders, 23 families, 45 Genera and 66 species have been recorded from Thar Desert of Rajasthan. Out of 115 species of bats (17 megabats and 99 microbats) reported from India, eight micro bats found in the Thar Desert covering the Shekhawati region (Sikar and Jhunjhunu) of Rajasthan. Hibernation is an adaptive approach in bats that facilitates coping with low ambient temperatures and inadequate food during winter. The over-winter survival of hibernating bats depends on the quantity of energy that animals store prior to hibernation, the rate of depletion of these reserves and the duration of winter. In this study compare the Body temperature (T_{body}) of roosted *Scotophilus kuhlii* during summer and winter using Infra red camera (FLIR C2) in urban environment as historical old haveli of shekhawati region. Period of winter average body temperature is decreased by 9.8±1.13°C and bats with parasite are also decreased by 9.1±0.95°C as compare to summer season. During the winter arousals, bats exhibited movement following T_{body} increase of only 9.8±1.13 °C, compare to >30.1±1.56 °C increases during normal arousals of *S. kuhlii*. The maximum and minimum values of (T_{body}) in winter with parasites are 21.9±0.90°C and 20.2±1.10°C respectively.

INTRODUCTION
Chiropterans, identifying as bats, are the only factual flying mammals. Bats globally comprise of 1,116 species belong to 202 genera, 18 families. They constitute about a quarter of the entire mammal species and are second to Rodents in phrase of diversity. Thar Desert in Rajasthan has only 6% area of the total area of the country. Within this little area, with hostile climatic environment, about 15.8% (68 out of 428) mammalian species are surviving. In India, about 13 orders, 42 families, 180 Genera and 390 species of mammals are present. Of these, 8 orders, 23 families, 45 Genera and 66 species have been recorded from Thar Desert of Rajasthan. Out of 115 species of bats 17 megabats and 99 microbats are reported from the Thar Desert of India. On the Indian sub-continent, *Scotophilus* represented by two sub-species including *S. heathii* and *S. kuhlii* (Bates and Harrison 1997, Srinivasulu *et al.*, 2010a). *Scotophilus heathii* Horsfield, 1831 is distributed from Afghanistan to South China, including Hainan Island, south to Sri Lanka, Vietnam, Cambodia, Thailand and Burma. The genus *Scotophilus* is represented by 12 species with distribution ranges from South Africa to Indonesia and the Philippines (Simmons 2005). *Scotophilus kuhlii* Leach, 1821 was formerly ques-tioned as *S. heathii* (Tate 1942, Ellerman and Morrison-Scott 1951), however, the taxon was later identified as a distinct species (Peterson

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Sorption of Cadmium Ions Using Inactive Biomass of *Pseudomonas fluorescens* and *Bacillus subtilis* Consortium from the Aqueous Solutions

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A B S T R A C T

Aquatic environment contamination with a high concentration of noxious heavy metals rises as an alarming condition and arises as a severe threat to all living organisms. Consequently, there is an urgent need to focus on advanced approaches for the remediation of aquatic systems. The present study aims to test the capacity of consortium biomass of *Pseudomonas fluorescens* and *Bacillus subtilis* for the sorption of cadmium ions from the polluted aqueous media. The optimum environment for the maximum sorption (84.22 %) of Cd was achieved after 80 minutes of time interval at pH 6, biomass 0.2 g and 20 mg/L of cadmium metal concentration. The adsorption data were well fitted to the Langmuir isotherm for cadmium adsorption (R^2= 0.9956) than the Freundlich isotherm (R^2= 0.9772), though the rate kinetics data were calculated by pseudo irst and second order models. The highest adsorption capability attained by consortium biomass for Cd ions was found about 55.86 mg/g. Thus, the present work implied that consortium biomass of *Pseudomonas fluorescens* and*Bacillus subtilis* could be utilized as an efficient biosorbent for eliminating cadmium ions from aqueous solutions.

Introduction

Heavy metal toxicity is the condition that arises when the metal concentration is found above the permissible limit in the environment and which shows a deleterious impact on the entire ecological system. During the last few decades, the indiscriminate release of heavy metal pollutants in aquatic systems has increased enormously that increasing the accumulation of toxicants in the food chain which affects the biological system adversely. Heavy metals namely cadmium, arsenic, chromium and lead are ingenious, silent, nuisance killers and the condition becomes worse when heavy metal ions frights to pollute the environment by both natural and anthropogenic origins. These metal ions enter the ecosystem through the combustion of fossil fuels, mining, refining and several industrial activities (Xie *et al.*, 1996). Cadmium is known as a highly noxious pollutant, which is dangerous to all

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Evaluation of *Atriplex lindleyi* Moq. for morpho-physiological and metal accumulation responses under Cd, Ni, and Zn stress

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Abstract
Several halophytic *Atriplex* species have been explored in the past for their possible use in reclamation of salt-affected soils. The aim of this research is to evaluate the phytoremedial potential of *Atriplex lindleyi* for Cd, Ni, and Zn along with its defense techniques and physio-morphological changes as it can interact, sequester and detoxify heavy metals. The results showed greater accumulation of Ni and Zn in plant tissues as compared to Cd. Defense responses through photosynthetic pigments and proline were also found to be varied in heavy metal treated plants. It was observed that most of the heavy metals absorbed by the plant were retained in the root i.e., 4.97, 29.31, and 597.2 mg kg^{-1} in comparison to the metal transported to above-ground parts of the plant i.e., 2.92, 23.25, and 182.74 mg kg^{-1} for Cd, Ni and Zn, respectively establishing this plant as a phytostabilizer. In conclusion, *Atriplex lindleyi* can be recommended as a potential candidate for the phytoremediation of Ni and Zn.

Keywords: *Atriplex lindleyi,* saltbush, phytoremediation, heavy metals

Introduction

Heavy metal contamination of soil and wastewater is a significant environmental problem that has a detrimental effect on human health and agriculture and is harmful or toxic even at low levels (Lenntech Water Treatment and Air Purification, 2004) [1]. Several heavy metals such as Cd, Zn, Cu, Pb, Ni, Cr, As are common pollutants present in wastewater which can dispersed in the environment for a long time and become a serious threat to different levels of food chains (Singh *et al.*, 2010) [2]. There are multiple sources of heavy metals in the environment, such as natural sources, agricultural sources, domestic effluents, and industrial sources. However, in recent decades anthropogenic activities have been increasingly associated with the accumulation of heavy metals in the environment. Industrial activities such as smelting, mining, dumping of municipal sewage sludge, burning of fossil fuels, and agricultural practices related to long-term use of excessive pesticides, fungicides, and fertilizers have led to a dramatic increase in heavy metal pollution in different areas (Ernst and Nelissen, 2000; D'Amore *et al.*, 2005) [3,4].

Heavy metals can also minimize the photosynthetic pigments, disturb the pigment-protein apparatus, or obstruct the light-driven photosynthetic electron transport within the chloroplast (Stepien and Klobus, 2006) [5]. In coping with the heavy metal stress, root tissue is the first to be exposed to the associated toxins, and its cell wall has a mechanism of exchange that fixes the metal ions, thereby limiting the transfer of toxins to other plant tissues (Branquinho *et al.*, 1997) [6]. To alleviate the heavy metals toxicities, chemical application and agronomical crop management practices have been used in past with a little bit of success. In related activities, the exogenous application of osmolytes such as proline has emerged as an alternative technique to induce plant potential to effectively overcome the harmful situation of heavy metals toxicity.

Several species belonging to the genus *Atriplex* are well adapted to harsh environmental conditions and is characterized by its great diversity with more than 400 species (Le Houérou, 1992) [7]. In the present study, experiments were carried out on the species *Atriplex lindleyi* because of its excellent drought and salinity tolerance and the well-developed growth profile. It is commonly known as "saltbush," which belongs to the subfamily Chenopodioideae of the family Amaranthaceae. *A. lindleyi* is a halophyte and has been suggested to be ideally suited for environmental susceptibility, particularly heavy metal stress. *Atriplex* is of specific importance in this context as these species are found naturally in an area characterized by an abundance of toxic ions, primarily Na^+ and Cl^- which favors the species survival in disturbed habitats. These species produce a high amount of oxalic acid, which may have a beneficial effect on resistant mechanisms towards toxic metals (Sayer and Gadd, 2001) [8].

The present investigation was carried out to evaluate the phytoremedial potential of *A. lindleyi* for uptake of heavy metals (Cd, Ni, and Zn) and to study the changes in the morphological (such as root length, shoot length, biomass) and biochemical parameters (chlorophyll, proline) of the plant under HM stress.

Materials and Methods

Procurement of certified seeds of *Atriplex lindleyi* was done from the United States Department of Agriculture Agricultural Research Service (USDA-ARS), Washington State University, USA and Arid Forest Research Institute

Structural and Electroactive properties of 55 MeV carbon ion beam irradiated polycarbonate films

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Abstract. Semicrystalline polycarbonate thin films have been prepared by solvent casting method and irradiated by 55 MeV carbon ion beam under vacuum at room temperature with various ion fluences. The Electro active properties of the ion beam irradiated films were illustrated by means of UV-Vis spectroscopy, Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), thermally stimulated discharge current (TSDC), For XRD we conclude that the effect of carbon beam irradiation on polycarbonate film that crystallite size in polycarbonate is decreased. For UV–Visible absorption spectra show that the energy band gap of polycarbonate decreases with ion fluences. The FTIR spectra of carbon ion beam irradiated polycarbonate film shows the cross linking and chain scissoring was observed. TSDC shows that activation energy, released charge, α-relaxation peak, and charge carrier mobility decrease while relaxation time and peak current increases with ion fluences.

Keywords: XRD; UV-Vis; TSDC; Polycarbonate

INTRODUCTION

Swift heavy ion beam irradiation is the most effective method to modify the chemical, electrical, optical, mechanical etc. properties of polymeric materials [1-3]. Polymer materials have played an active role in high technology applications such as semiconductor technology, sensors, optics, photonics, and data storage devices for last 55 years. Polymers have received a lot of attention because they can be easily fabricated and processed into any desired shape. One example for a class of high technology polymers are polymer electrets, which are dielectrics exhibiting either oriented dipoles or quasi-permanently stored real charges. The polymer electret concepts led to the large variety of applications, ranging from sensors and actuators to photonics. There are several application of electret such as sensor, transducer, energy storage devices, microphone and dosimeters. In this work, we study the effect of ion beam at various ion fluences in PC films in the terms of structural and elcctroactive properties. The structural and elcctroactive properties were investigated using various characterizations techniques like X-ray diffraction (XRD), UV–Vis, Fourier transforms infrared (FTIR) and TSDC measurement.

EXPERIMENTAL PROCEDURE

Preparation of the films

PC pellets and dichloromethane (DCM) were procured from Redox, India. The films of PC 20μm thickness have been used in this study. The solution of particular concentration was prepared in a glass beaker by dissolving PC (5gm) in 150 ml of DCM at room temperature (350K). The solution was kept for 24h to give homogeneous and transparent solution. The solution thus prepared was poured onto an optically plane glass plate floating in mercury

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Stability and electronic properties of ZnSe nanowires: An ab initio approach

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The presented work revolves around exploration of the structural dependence of electronic properties of zinc selenide nanowire. For this purpose the shapes under consideration are 2_atom_linear wire, 2_atom_zigzag wire, 4_atom_square wire and 6_atom_hexagonal wire for zinc selenide. ABINIT code has been used for the study. The band structure, geometrical optimization and stability of proposed structures have been studied. A 4_atom_square nanowire structure has come out to be comparatively more stable than other proposed structures while the findings of the study for band structure reveals that zinc selenide nanowires may have conducting, semi conducting or insulating nature which depends on the proposed geometry of the nanowire.

Keywords: zinc selenide nanowires, band structure, electronic properties, density function theory.

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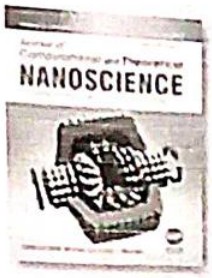
1. Introduction

The electrical properties and study of nanowires have been interesting fields to study for the researchers since the 1980's. A drastic variation in optical as well as electrical behavior of these nanostructured substances is seen as compared to their bulk form. The miniature devices show exotic properties and this has increased the need of investigation and exploration of behavior of metallic structure of nanometer-sized dimensions for such devices. These devices seen to have significant advantages over the devices formed by photolithography. The structural dependence of electronic behavior of few nanowires with significant technical importance with implication of local density approximation is the outcome of this proposed work. Extensive experimental work on germanium and silicon nanowires has been already performed by researchers [1–3]. From the family of II–VI group ZnSe semiconductor has its unique application as light emitting diodes [4], photo detector [5] and scintillator [6]. Sufficient experimental work is reported on synthesis of zinc selenide nanowires. Ye et al. [7] synthesized ZnSe nanowire of thickness 20 to 120 nanometer and tens of micrometers in length under an Ar atmosphere by vapor transport. Panda et al. [8] reported that alignment and confinement play a major role in optical properties of synthesized ZnSe nanorods and nanowires. Singh et al. [9] reported the structural dependence for ZnO. ZnSe nanowires with the length of few micronmeters and 80 – 150 nanometers in diameter were fabricated and current-voltage characteristics were being studied by Philipos et al. [10]. ZnSe nanowire were being synthesized on the zinc foil by Cheng et al. [11]. Archana et al. [12] used edamine as surface capping ligand and synthesized ZnSe nanowire by wet chemical method. First principles study of optical, magnetic and electronic properties of ZnSe was performed by Benstali et al. [13]. Arya et al. [14] in their work, fabricated ZnSe nanowire via template-assisted electro deposition method. Nasieka et al. [15] studied the doping effect of Er on ZnSe and studied structural properties and found that varying the dopant concentration led to disorder in initial structure. Eitan et al. [16] have performed the guided growth of horizontal zinc selenide nanowires in controlled manner. Zhang et al. [17] studied the first-principles calculations on the basis of DFT investigated the electronic structures and optical properties of Cr^{2+} zinc selenide. Dong et al. [18] synthesized ZnSe nanowire via a heat-triggered precursor route. Wisniewski et al. [19] used low temperature spectroscopy to identify the recombination mechanisms for ZnSe nanowire.

The proposed work deals with comparative study of electronic properties, band structure and density of state curve study for four different shapes 2-atom_linear nanowire, 2-atom_zigzag nanowire, 4-atom_square nanowire and 6-atom_hexagonal nanowire, which has not been explored by anyone so far.

2. Computational details

The structure of zinc selenide nanowires using DFT calculations [20,21] was explored. This pseduopotential technique is found to be very dynamic tool for studying the electronic and structural properties of different materials [22]. The present study has been performed by ABINIT code [23]. Exchange correlation of Troullier, Martins and Perdew et al. [24, 25] has also helped in calculations. The pseduopotential has been obtained from ABINIT Webpage. To test the potentials the calculations were performed on bulk zinc selenide material. The results showed close agreement



Ab Initio Study of Electronic Properties of Cadmium Sulphide Nanowires

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Abstract | References | Citations | Supplementary Data | Suggestions

In present study, we have explored CdS nanowire and their electronic properties for different structure. The study has been performed by ABINIT code. Four shapes under consideration were 2-atom linear, 2-atom zigzag, 4-atom square and 6-atom hexagonal nanowire. The geometric optimization, stability of different structures and band structure of the shapes has been studied. The findings reveal that four atom square nanowire structure is comparatively more stable than other structures whereas the study of band structure reveals that CdS nanowires may be conducting, semi conducting or insulating depending upon the geometrical shape of the nanowire.

Keywords: Band Structure; CdS Nanowires; Density Function Theory; Density of State; Electronic Properties

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Taxonomic Identification of Plants Growing On and Deteriorating Buildings of Cultural Heritage Importance in Manipur

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ABSTRACT: The ethnic city, Manipur, was ruled by the Mughals, Marathas, Afghans and Nawabs in various time periods. Among them the Mughal and Nawabs influenced the culture of the city vastly. The music, dance, architecture, arts and crafts flourished under their rule. Hindu, Muslims, Jains, Buddhist, Christian and Sikhs were the principle communities residing in the city. Festivals are the lifeline for Manipur, which create oneness among the multi-caste and multi-religion people. The Hindu culture of joint family system was once adored in the city which has slowly disintegrated in the city due to the rapid industrial development, urban development, economic issues and social feature.

The growth of higher plants over monuments and historic buildings is one of the major problems faced by conservators especially in Manipur. These plants have been reported to cause physical as well as chemical damage. This paper reviews the present status of knowledge in this field with respect to the plant species generally found growing over the monuments, types and mechanism of damage and their control methods, in Manipur .

I. INTRODUCTION

The rituals of the Vedic religion manifest themselves in the various festivals that are celebrated in this city. People usually do not consume non-vegetarian food on Thursdays. It's annual Janardhan Swami Temple, and Sivagiri Mutt festivals are a riot of colors and spiritual expression. These festivals that last for days on end attract locals and tourists alike by the thousands. The city has a lively appeal on Tuesdays, as it celebrates the birth day of Lord Hanuman. The devotees flock to the local temples to offer prayers and tourists should visit the temples on these days if they want to see the city come alive. The famous city fair is held at Sheetla Devi Temple in March or April because the nine days of worshiping the various avatars of Goddess Durga i.e. the Chaitra Navratri occurs sometime during these months. During these nine days, many of the locals also keep fasts where they eat only fruits during this period. And men do not even shave their beards or mustaches.Kangla (Palace) which is now garrisoned by the Assam Rifles, was the cosmic centre of the universe of the land and its people, a centre of dignity and pride of the state. The entire demographic and political engineering of the polity was organized from the ruler's seat in ancient times.[1]

Meitei architecture or Manipuri architecture is the architecture produced by the Meitei speaking people, whose culture flourished in the Kangleipak kingdom and its neighbouring kingdoms from the middle of the fifteenth century BC. The Meitei architecture is best known for its temples (Laishang, Kiyong,Thellon), found scattered in the Kangleipak (present day Manipur). Other architectural forms that are still in existence are the grand gates (Hojang), Traditional houses (Yumjao), Public houses (Sanglen), Official buildings (Loishang), etc. Due to the arrival of Hinduism in the kingdom of Kangleipak (present day Manipur), the form of architecture was greatly influenced during the 16-17th century AD. Hundreds of Vaishnava temples were built in the kingdom with a mixed architectural design of both the traditional Meitei architecture and Mainland Indian architecture.[2]

Some plants, not all, have the ability to grow on buildings. If you wonder how they got in there, the answer is seed dispersal agents (wind, animals, birds etc). Crows and pigeons are good examples. They eat fruits along with seeds but the seeds don't get digested easily and comes out when they excrete. When these excreta falls on buildings and if the conditions favor plant growth, the seed germinates. They generally grow on cracks and holes in buildings because water gets collected in it, keeping moisture intact for the roots and the soil in cracks is more penetrable than a newly painted wall. That's why you can such plants in old buildings and not in new ones.

When the roots grow deeper, they weaken the wall and result in destruction of the whole building. This happens mostly in uninhabited buildings where nobody cares to remove them. Plants are good, but when carelessly left can result in several consequences.

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Taxonomic Identification of Micro-Organisms Growing on and Cause Biodeterioration of Cultural Heritage of Agra and Mathura Region

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ABSTRACT

Fungi and bacteria have been known to degrade dye particles and other coloring agents. However in the present investigation fungal enzymes deteriorate monument walls and make them ugly. The various historical monuments have been made cracked by fungal and bacterial enzymes like lipase, cellulose, ligninase, pectinase etc. These are secreted by their cell wall. Fungi and bacteria release these enzymes and in presence of moisture and suitable temperature and environmental conditions degrade and break the walls of monuments by deteriorating their rocks and calcium particles. Also various magnesium particles are broken by fungal and bacterial enzymes by growth of fungi in long period of time. The fungi and bacteria have the ability to grow fast also and they continue their growth in historical monuments.

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INTRODUCTION

We can see many fungi and bacteria of different colors growing in monumental walls. Hence our historical monuments get deteriorated. No care is taken by spraying antifungals or antibacterials. Hence the monuments have lost their beauty. Many fungi like *Aspergillus niger, Cladosporium spahaerospermum, Trichoderma harzianum, Albugo candida, Aspergillus flavus, Aspergillus fumigatus* etc. have their dominance on the walls of historical monuments. Bacteria like *Streptococcus, Streptobacillus, Vibrio, Clostridium* etc. also cut the beauty of monumental walls.[10]

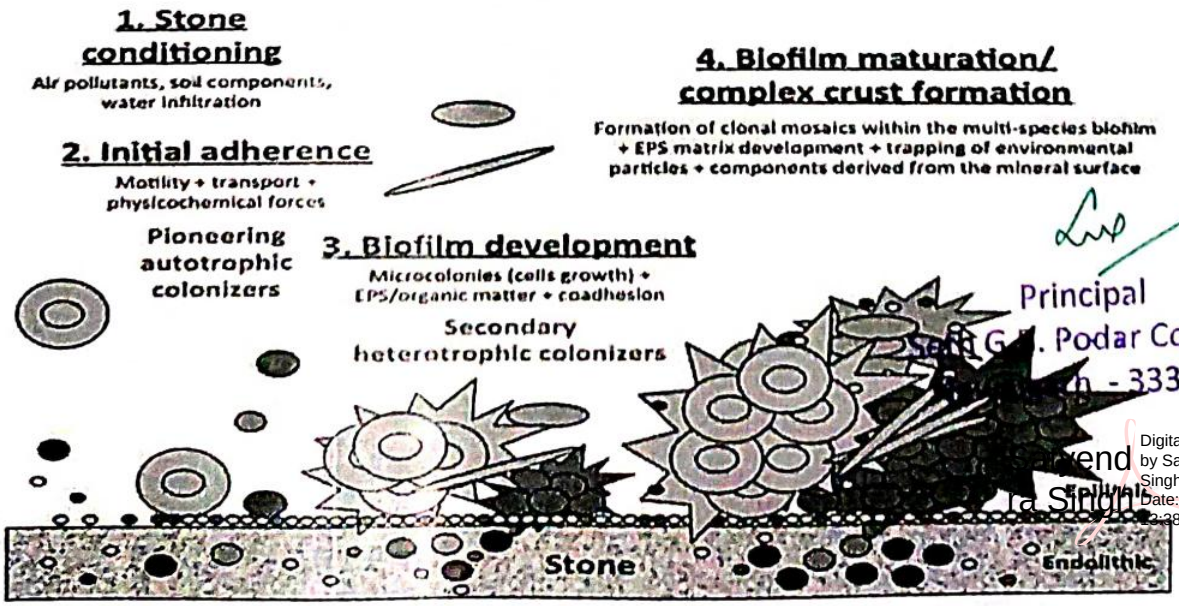

Fig-1: Fungi and bacteria degrading stone monuments (process)

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Fungal Biodeterioration of Documentary Heritage (Manuscripts) and Their Conservation through Tradition Way of Conservation with Special References to Paper and Palm Leaf Manuscripts

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ABSTRACT

Fungi damage valuable documents mechanically, chemically and aesthetically because they form hyphae, excrete pigments and organic acids, generating particular local conditions that modify the physical-chemical properties of the different documentary supports. The genera *Aspergillus, Cladosporium, Fusarium, Scopulariopsis* were predominant. Isolated strains excreted acids into the culture medium; most of them grew well on cellulose and a few excrete pigments. The formation of a mature biofilm and the production of extracellular polymeric substances by fungi, as well as a dense biofouling mainly formed by dust mites. These strains are able to attach to paper fibre causing damage on them. The Cultural developments are the reasons for urging to write and leading to search new writhing materials, which played a vital role in the field of education and development Libraries. Various type of materials such as stone, clay tablets, metal sheets, wood, papyrus, palm leaves, barks of trees, cloth, leather, paper etc., were used for writing. Writing on the above materials on hand is called manuscripts. Manuscripts are the form of recorded information, which are the vehicle for preservation and dissemination of knowledge to the endless generations to come. Generally Manuscripts are rare commodities written on wide range of subjects like religion, philosophy, history, literature, medicine, and science. Manuscripts can be classified on the basis materials used.

INTRODUCTION

Leaves of palm trees are used for writing, which are called Palm leaf manuscripts. Palm leaf is a natural material, which are available in India and south Asian countries. Even though more than 300 varieties of Palm trees available, only three varieties were used for writing, which are

1.Corypha umbraculifera

2. Borassus flaberllifer

3. Corypha utan

The leaves of the above three varieties are differ with their character, size and other physical and chemical compositions. For the logitivity of the manuscripts leaves were collected, separated, dried, burnished, seasoned and written. Even the string holes were made in an order to tie the leaves bound. For writing on stylus, seasoning was done to soften the surface and blackening the letters vegetable juice with a mixture of lamp shoot is applied. The written manuscripts were bound with external guard using planks of bamboo or teak wood. Chords or silk threads are used for string the manuscripts.

Palm leaves are organic nature, which are generally considered to be more susceptible to deterioration. Palm leaves are made up of cellulose fiber content materials. Though which are having very good tensile strength compared to paper; it becomes very brittle due to dryness. Lignin present in palm leaves is susceptible to oxidation and hydrolysis, yielding acidic derivatives, which affect the fiber bond of the leaves.

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Fault Analysis of Electric Power System using PLC and Wireless Communication System

Uma Soni, Uma Kumari

Abstract:- *In present scenario electricity theft is the major hurdle in front of government. This paper comprises of functions and architecture of the smart metering and monitoring network system which works on real time data communication and have its own network. Our main motive is to design and develop such a wireless metering system which will prevent power theft and provide us a reliable and accurate metering monitoring system by using modern technology. The design comprises of wireless power metering and monitoring network which will work on principle of real time data communication(which is not available in existing wireless GSM metering system) and will use its own reliable network with the help of Programmable Logic Controller. Programmable Logic Controller, smart meters, wireless communication modules and profinet cable are the key components of the system. To provide a better and easy human interface with the smart meter we are using simplify S CADA and programming which is very user affable.*

Keywords:- *Wireless NCS , controllers, PLC, SCADA, GSM metering system and smart meter.*

I. INTRODUCTION

In existing wireless metering system (GSM based) there is no provision of live (real time) metering data monitoring. It can only provide the metering details when request is sent to any node. After receiving request, that particular node sends data in the form of packet. The packet contains the metering data for any specific period of time, not in form of continuous waveform which is the major drawback of GSM wireless meters. These wireless meters(GSM based) are not having their own network, but they are using the mobile networks which is not reliable. Moreover the speed of the network is not up to the mark. In GSM based wireless meters we have only few specific parameters. So to overcome said drawbacks we are developing one metering system which fulfills all these requirements. For that we are using PLC, smart meter, wireless communication modules, profinet cable, and programming of PLC for the communication with smart meter, and SCADA representation of the metering values of smart meter.

A. About PLC

PLC is a programmable logic controller that contains hardware and software capable of being programmed to perform control functions. A PLC is a controller which performs task on the basis of customize instructions (called program). Normally used for industrial control system. PLC process the inputs on the basis of following steps.

- Reading inputs.
- Executing the program.
- Processing communication request.
- Executing CPU diagnosis.
- Writing outputs.

PLC program are typically written in special language on a personnel computer and then downloaded to the PLC. PLC can be programmed using standard based programming languages like FBD (Function Block Diagram), ladder logics, structured text, instruction list and sequential function chart.

B. Hardware Assembly of PLC:-

PLC is mounted on a rack which is called PLC rack and on the rack first two modules are the power supply modules which give the power supply to the CPU and the remaining modules are mounted on the rack. In two power supply modules one is the redundant.

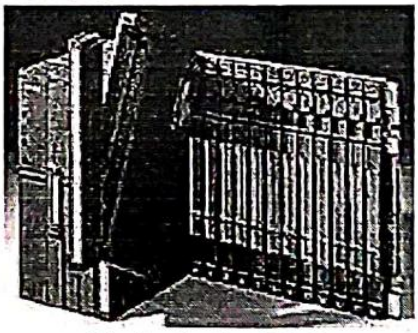

Fig.1:- Rack of PLC

The processor and I/O modules are designed according to the particular application. Several racks can be administered by a single processor and may have thousands of inputs and outputs. It can be designed for multiple arrangements of digital and analog I/O.

C.User Interface or SCADA:-

PLCs may have to move with individuals for the aim of configuration and everyday management. A human machine interface (HMI) is employed for this purpose. HMI's are also referred to as man machine interface and graphical user interface. SCADA is a control framework engineering that utilizes PC's, organized information correspondences and graphical user interface for high level state process supervisory administration. The administrator interfaces with SCADA who is monitoring and giving processing command.

II. LITERATURE SURVEY AND RELATED WORKS

In India, people are using traditional and simple technique to measure energy such as going door to door to measure the readings .

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Wireless Smart Metering and Monitoring System for Household Power Theft

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Abstract

In the present scenario and existing technological era still we are running with our old and outdated metering systems in households. Existing system is having many drawbacks and loopholes, which make power distribution as a loss making job for government. This can be due to power theft or wrong metering data or inefficient or inaccurate metering data. So to overcome from these loopholes and drawbacks we came up with an advance wireless power metering and monitoring system. This wireless power metering and monitoring system can play a revolutionary role in the field of housing power distribution & metering system.This wireless, PLC and smart meter based system have many advance features.By using smart meters, the accuracy of metering system has increased as compared to the other metering systems. We can have as many as hundreds of parameter readings. It also provides us the facility to check past and present parameter readings (time wise trend is available). It also have the alarm facility to indicate illegal activities done by different people with meter. No communication cable is required between meter and PLC (which is at Electricity Board office). Automatic bills can be generated with full reliability and accuracy. Its system architecture comprise of PLC, Smart meter, modems and power supply for PLC.This paper comprises methods of power theft, proposed smart power metering system architecture and functions, PLC and SCADA development and result analysis of proposed system.

Keywords: *- PLC, Smart meter, SCADA, Modems and Power supply*

1. Introduction

Proposed wireless power metering and monitoring system can play a revolutionary role in the field of household power distribution & metering system. Till date we have majorly 3 types of metering systems in power distribution which are electromagnetic meters, GSM meters and digital screen meters [1]. Out of these meters none provide us the real time data communication. These metering systems does not show the live status of the meters. The parameters of these meters are not live at any time.Only GSM metering system provides us data in form of data packets and provide wireless communication.

Main drawback of these meters is, there is no choice to get any of parameter readings at a particular time. In case of GSM, the network is not reliable because GSM uses SIM based GSM networks which can fail at any time. Also, network may get slow due to overloading on the network. All these problems are rectified in proposed network.

This paper comprises of functions and architecture of the "Smart Metering and Monitoring Network System". Our fundamental thought process is to structure and grow a remote metering framework which can forestall power theft and give us reliable, accurate, precise, and real time metering monitoringframework by utilizing modern innovations in power industry. The design comprises of wireless power metering and monitoring network which can work on principle of real time data (which isn't possible in existing remote GSM metering framework). Furthermore, it utilizes its own dependable systems with the assistance of Programmable Logic Controller. Programmable Logic Controller, smart meters, wireless communication modules and profinet cable, SCADA are the key parts of the framework. To give a superior and simple human interface with the smart meter we are utilizing streamline SCADA and programming which is very client friendly.

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Role of District Central Co-operative Banks Credit in Farming and Non-Farming Sector

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Abstract

The operation of Cooperative banks in Rajasthan is almost 50 years old, at the initial level it caters only urban areas of the state but in later years it started its operation in rural areas as well. The main reason to establish Cooperative banks was to provide easy loans to the members of said cooperatives; these loans are of various natures like short-term and long-term loans for agriculture purpose and to start new and small business in the vicinity. This present study will try to draw the attention to the development initiatives taken by the institution in order to cater both the farming and non-farming needs of the rural people.

Keywords: Cooperatives, Farming and non-farming sect, development.

Introduction

About the State of Rajasthan

After the demarcation of Uttarakhand in Uttar Pradesh and Chhattisgarh in Madhya Pradesh, Rajasthan was titled as the biggest state of the country. The NW (*North West*) border of the state is crucial enough as it is the last line of defense against Pakistan. Biggest desert of the country lies in Rajasthan by the name of 'Thar' here the Aravali range of mountains split the state in two parts i.e. desert and forests. As a matter of fact, approximately 10% of the total area is under vegetation and rest is barren land. As far as agriculture is concerned approximately 8% of the total geographical area is being cultivated and rest of the land is not appropriate for regular farming as it is sandy in texture.

Co-operative Banks in Rajasthan

The operation of Cooperative banks in Rajasthan is almost 50 years old, at the initial level it caters only urban areas of the state but in later years it started its operation in rural areas as

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On unified subclass of univalent functions of complex order using the Frasin operator

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Abstract *— In the present investigation, we consider a unified class of univalent functions of complex order defined in the open unit disk $\mathbb{U}$ involving the Frasin operator. Some known consequences of the results are also derived.*

Keywords — *Analytic functions, Univalent functions, Starlike functions, Complex order and Subordination.*

I. INTRODUCTION

Let $\mathcal{A}$ be the class of functions of the form

$$f(z) = z + \sum_{n=2}^{\infty} a_n z^n \tag{1.1}$$

which are analytic in the open unit disk $\mathbb{U} = \{z: |z| < 1\}$

Let f and g are analytic in $\mathbb{U}$. We say that the function f is subordinate to g and we write $f \prec g$ or $f(z) \prec g(z) (z \in \mathbb{U})$, if there exists an analytic function ω in $\mathbb{U}$ with $\omega(0) = 0$ and $|\omega(z)| < 1$, such that $f(z) = g(\omega(z)) (z \in \mathbb{U})$. if g is univalent in $\mathbb{U}$, then the following equivalence relationship holds good see(9):

$$f(z) \prec g(z) \Leftrightarrow f(0) \prec g(0), f(\mathbb{U}) \subset g(\mathbb{U}) \tag{1.2}$$

$\mathcal{S}$ (say) be the subclass of $\mathcal{A}$ consisting of univalent functions. For the function $f \in \mathcal{A}$ and making use of the binomial series

$$(1-\vartheta)^k = \sum_{i=0}^{k} \binom{k}{i} (-1)^i (\vartheta)^i, \text{where } i = \mathbb{N} \cup \{0\} \text{ and } k \in \mathbb{N}.$$

Now we define the differential operator $\mathcal{D}_{k,\vartheta}^{\xi} f(z)$ as follows:

$$\mathcal{D}^0 f(z) = f(z). \tag{1.3}$$

$$\mathcal{D}_{k,\vartheta}^1 f(z) = (1-\vartheta)^k f(z) + (1-(1-\vartheta)^k) z f'(z). \tag{1.4}$$

$$= \mathcal{D}_{k,\vartheta} f(z), \ \vartheta > 0; k \in \mathbb{N}. \tag{1.5}$$

$$\mathcal{D}_{k,\vartheta}^{\xi} f(z) = \mathcal{D}_{k,\vartheta} \left(\mathcal{D}^{\xi-1} f(z)\right), (\xi \in \mathbb{N}). \tag{1.6}$$

If f is given by (1.1), then from (1.5) and (1.6), we see that

$$\mathcal{D}_{k,\vartheta}^{\xi} f(z) = z + \sum_{n=2}^{\infty} \left(1 + (n-1) \sum_{i=1}^{k} \binom{k}{i} (-1)^{i+1} \vartheta^i\right)^{\xi} a_n z^n, \xi \in \mathbb{N} \cup \{0\}. \tag{1.7}$$

Using the relation (1.7), it is easily verified that

$$\mathcal{C}_i^k(\vartheta)\, z \left(\mathcal{D}_{k,\vartheta}^{\xi} f(z)\right)' = \mathcal{D}_{k,\vartheta}^{\xi+1} f(z) - \left(1 - \mathcal{C}_i^k(\vartheta)\right) \mathcal{D}_{k,\vartheta}^{\xi} f(z), \tag{1.8}$$

where, $\mathcal{C}_i^k(\vartheta) = \sum_{i=1}^{k} \binom{k}{i} (-1)^{i+1} \vartheta^i$.

We observe that for $k = 1$, we obtain the differential operator $\mathcal{D}_{1,\vartheta}^{\xi}$ defined by Al-Oboudi [11] and for $k = \vartheta = 1$, we get Salagean differential operator $\mathcal{D}^{\xi}$ [5].

The main aim of the present investigation is to apply a method based on the differential subordination in order to derive many subordination results involving the operator $\mathcal{D}_{k,\vartheta}^{\xi}$. Furthermore, we get the previous results of Srivastava and Lashin [14] as special cases of some of the results presented here.

II. DEFINITIONS

Let $\phi(z)$ be an analytic function with positive real part of ϕ with $\phi(0) = 1, \phi'(0) > 0$ which maps $\mathbb{U}$ onto a region Starlike with respect to $(1-b)$.

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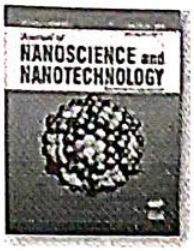

Photocatalytic Performance of ZnSe-rGO Nanocomposites: Synthesis, Characterization and Composition Dependence

Authors: Yadav, Anil [1]; Nehra, S. P [2]; Patidar, Dinesh [3];
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Abstract | References | Citations | Supplementary Data | Article Media | Metrics | Suggestions

The ZnSe-rGO nanocomposite with various stacking of rGO by simple solvothermal route was reported along with its characterization through X-ray diffraction (XRD), scanning electron microscopy (SEM), high resolution transmission electron microscopy (HRTEM), Raman and photoluminescence spectroscopy. SEM as well as TEM pictures predict that ZnSe nanoparticles were embedded on the graphene sheets with average particle size 15 nm and are well decorated on the surface of rGO sheets. Photocatalytic activity's improvement for degradation of MB by ZnSe-rGO nanocomposites was observed, which is described in term of interaction between ZnSe nanoparticles and rGO sheets and charge carrier sepatation. It is also reflected in photoluminescence and Raman studies. This plays a crucial role in minimizing electron–hole recombination through transfer of electron from ZnSe to rGO.

Keywords: Photocatalytic Activity; Photoluminescence; Raman Spectroscopy; ZnSe-rGO Nanocomposites
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A Study of Distortion Theorem and Inclusion Relations for a new class of Meromorphic Functions

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Abstract:*By having used of differential subordination, it has been investigated in the present paper, subordination relations, inclusion relations, distortion theorem and inequality properties are discussed of the class* $\mathbb{MB}(\alpha,\lambda,\ell,\mu,A,B)$. *In this paper it has been introduced some new classes* $\mathbb{MB}(\alpha,\lambda,\ell,\mu,A,B)$ *of meromorphic functions which are defined by means a meromorphic function using a new operator.*

Date of Submission: 05-03-2019 Date of acceptance: 22-03-2019

I. Introduction

Let Ω_{m+1} be the class of function of the form

$$f(z)=\frac{1}{z}+\sum_{k=0}^{\infty}a_k z^k \quad (1)$$

which are analytic in the punctured unit disk $\mathbb{U}^*=\{z: z\in\mathbb{C} \text{ and } 0<z<1\}=\mathbb{U}\backslash\{0\}$
If $f(z)$and $g(z)$ are analytic in $\mathbb{U}$, we say that $f(z)$ is subordinate to $g(z)$, written symbolically as follows $f(z)\prec g(z)$or $f\prec g$ $(z\in\mathbb{U})$. If there exist a Schwarz function $\omega(z)$, which is analytic in $\mathbb{U}$ with $\omega(0)=0$ and $|\omega(z)|<1$ $(z\in\mathbb{U})$ such that$f(z)=g(\omega(z))$ $(z\in\mathbb{U})$. If the function $g(z)$ is univalent in $\mathbb{U}$, it has the following equivalence (cf., e.g., [11]; [12])

$$f(z)\prec g(z)(z\in\mathbb{U})$$
$$\Leftrightarrow f(0)=g(0)\text{and } f(\mathbb{U})\subset g(\mathbb{U}).$$

We define the convolution or Hadamard product of the functions $f(z)$ and $g(z)$ by

$$(f*g)(z)=\frac{1}{z^p}+\sum_{k=p}^{\infty}a_k b_k z^k=(g*f)(z)\ (p\in\mathbb{N},z\in\mathbb{U} \quad (2)$$

Following the current work of Liu and Srivastava [7] see also [8], [9] for a function $f(z)$ in the class Ω_{m+1} given by (1), now it is defined the integral operator

$$Q_p^m(\ell,\lambda)f(z)=\frac{1}{z^p}+\sum_{k=p}^{\infty}\left[\frac{\ell}{\ell+\lambda(p+k)}\right]^m a_k z^k \quad \{\lambda\ell>0\} \quad (3)$$

The above integral operator converts into the following operator with $p=1$

$$Q_1^m(\ell,\lambda)f(z)=\frac{1}{z}+\sum_{k=1}^{\infty}\left[\frac{\ell}{\ell+\lambda(1+k)}\right]^m a_k z^k \ ,(\ell>0,\lambda\geq 0,m\in N_0;z\in\mathbb{U}^*) \quad (4)$$

It is easily verified from (4)

$$\lambda(z)\left(Q_1^{m+1}(\ell,\lambda)f(z)\right)'=\ell Q_1^m(\ell,\lambda)f(z)-(\lambda+\ell)Q_1^{m+1}(\ell,\lambda)f(z),(\lambda>0) \quad (5)$$

Making use of the principle of differential subordination as well as the operator$Q_1^{m+1}(\ell,\lambda)$, now it is introduced a subclass of the function classΩ_{m+1} as follows.

II. Definition

Suppose that$\alpha\geq 0,\mu>0,-1\leq B\leq 1,A\neq B,A\in R$, we say that a function $f(z)\in\Omega_{m+1}$ is in the class $\mathbb{MB}(\alpha,\lambda,\ell,\mu,A,B)$ if is satisfies

$$(1-\alpha)\left(zQ_1^{m+1}(\ell,\lambda)f(z)\right)^{\mu}+\alpha\left(zQ_1^m(\ell,\lambda)f(z)\right)\left(zQ_1^{m+1}(\ell,\lambda)f(z)\right)^{\mu-1}\prec\frac{1+Az}{1+Bz},z\in\mathbb{U}$$

In particular, we claim $\mathbb{MB}(\alpha,\lambda,\mu,-2\rho-1)\equiv\mathbb{MB}(\alpha,\lambda,\ell,\mu,\rho)$denote the subclass of $\mathbb{MB}(\alpha,\lambda,\ell,\mu,A,B)$ for $A=1-2\rho,B=-1$ and $0\leq\rho<1$

It is clear that $f(z)\in\mathbb{MB}(\alpha,\lambda,\ell,\mu,\rho)\Leftrightarrow f(z)\in\Omega_{m+1}$ and satisfies$(1-\alpha)\left(zQ_1^{m+1}(\ell,\lambda)f(z)\right)^{\mu}+\alpha\left(zQ_1^m(\ell,\lambda)f(z)\right)\left(zQ_1^{m+1}(\ell,\lambda)f(z)\right)^{\mu-1}>\rho,(z\in\mathbb{U})$

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Characteristic Properties Of Subclasses For The Meromorphically Multivalent Functions

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Abstract: In the present paper, we introduce and investigate some new classes of multivalent functions involving linear operator and derive useful characteristic properties for Meromorphically multivalent functions. Several results are presented exhibiting relevant connections to some other results proved here and those obtained in earlier works.

Keywords: Analytic functions, Meromorphic functions, multivalent functions, linear operator and Hyper geometric function.

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I. INTRODUCTION

For any integer $m > -p$, let $\mathcal{T}_{p,m}$ denote the class of all meromorphic functions $f(z)$ of the form

$$f(z) = z^{-p} + \sum_{r=m}^{\infty} a_r z^r \ (p \in \mathbb{N}) \qquad (1)$$

which are analytic and p-valent in the punctured unit disk $\mathbb{D}^* = \{z: z \in \mathbb{C} \text{ and } 0 < |z| < 1\} = \mathbb{D}/\{0\}$.

Now we define the general integral operator $\chi_p^n(\alpha,\beta)f(z)$ which is as follows

$$\chi_p^n(\alpha,\beta)f(z) = \frac{\beta}{\alpha} z^{-p-\left(\frac{\beta}{\alpha}\right)} \int_0^z t^{\left(\frac{\beta}{\alpha}+p-1\right)} \chi_p^{n-1}(\alpha,\beta)f(t)dt$$

$$= \chi_p^1(\alpha,\beta)\left(\frac{1}{z^p(1-z)}\right) * \chi_p^1(\alpha,\beta)\left(\frac{1}{z^p(1-z)}\right) * \dots * \chi_p^1(\alpha,\beta)\left(\frac{1}{z^p(1-z)}\right) \in f(z), z \in \mathbb{D}^* \text{and } p \in \mathbb{N} (2)$$

For the sake of convenience, in particular cases

(i) If $n = 0$ then the above integral operator $\chi_p^n(\alpha,\beta)f(z)$ converts into $\chi_p^0(\alpha,\beta)f(z) = f(z)$.

(ii) If $n = 1$ then the above integral operator $\chi_p^n(\alpha,\beta)f(z)$ converts into $\chi_p^1(\alpha,\beta)f(z) = \left(\frac{\beta}{\alpha}\right) z^{-p-\left(\frac{\beta}{\alpha}\right)} \int_0^z t^{\left(\frac{\beta}{\alpha}+p-1\right)} f(t)dt$.

(iii) If $n = 2$ then the above integral operator $\chi_p^n(\alpha,\beta)f(z)$ converts into $\chi_p^2(\alpha,\beta)f(z) = \left(\frac{\beta}{\alpha}\right) z^{-p-\left(\frac{\beta}{\alpha}\right)} \int_0^z t^{\left(\frac{\beta}{\alpha}+p-1\right)} \chi_p^1(\alpha,\beta)\, f(t)dt$.

Hence, if $f(z) \in \mathcal{T}_{p,m}$, we obtained the following results

$$\chi_p^n(\alpha,\beta)f(z) = \frac{1}{z^p} + \sum_{r=m}^{\infty} \left[\frac{\beta}{\beta+\alpha(r+p)}\right]^n a_r z^r \qquad (3)$$

Therefore from (3), it is easy to see that

$$\alpha z\left(\chi_p^{n+1}(\alpha,\beta)f(z)\right)' = \beta\chi_p^n(\alpha,\beta)f(z) - (\alpha p + \beta)\chi_p^{n+1}(\alpha,\beta)f(z) \qquad (\alpha > 0) \quad (4)$$

We observe that (i) $\chi_p^{\lambda}(1,1)f(z) = \mathrm{P}_p^{\lambda}f(z)$ (see, [4]), (ii) $\chi_1^{\lambda}(1,j)f(z) = \mathrm{P}_j^{\lambda}f(z)$

We also see that

(i) $\chi_p^n(1,\beta)f(z) = \chi_{p,\beta}^n f(z)$ where $\chi_{p,\beta}^n f(z) = \frac{1}{z^p} + \sum_{r=m}^{\infty} \left[\frac{\beta}{\beta+(r+p)}\right]^n a_r z^r$

(ii) $\chi_p^n(\alpha,1)f(z) = \chi_{p,\alpha}^n f(z)$ where $\chi_{p,\alpha}^n f(z) = \frac{1}{z^p} + \sum_{r=m}^{\infty} \left[\frac{1}{1+\alpha(r+p)}\right]^n a_r z^r$

(iii) $\chi_p^n(1,1)f(z) = \chi_p^n f(z)$ where $\chi_p^n f(z) = \frac{1}{z^p} + \sum_{r=m}^{\infty} \left[\frac{1}{1+(r+p)}\right]^n a_r z^r$

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II. DEFINITIONS

Let $\mathcal{T}_{p,m}^{n+1}(\eta,\delta,\mu,\lambda)$ be the class of functions $f(z) \in \mathcal{T}_{p,m}$ which is satisfies the condition

$$\Re e\left\{(1-\lambda)\left(\frac{\chi_p^{n+1}(\alpha,\beta)f(z)}{\chi_p^{n+1}(\alpha,\beta)g(z)}\right)^{\mu} + \lambda\frac{\chi_p^n(\alpha,\beta)f(z)}{\chi_p^n(\alpha,\beta)g(z)}\left(\frac{\chi_p^{n+1}(\alpha,\beta)f(z)}{\chi_p^{n+1}(\alpha,\beta)g(z)}\right)^{\mu-1}\right\} > \eta \qquad (5)$$

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Prevention of Power Theft Using Concept of Multifunction Meter and PLC

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***Abstract*:-** In the system and networks, abnormal behavior is detected by anomaly-based IDS (Intrusion Detection System). If the working of a computer system is different from normal working is considered as an attack. The difference of comparison relies on traffic rate, a variety of packets for every protocol etc. Malicious traffic or data on a system is detected by intrusion detection process. To detect illegal, suspicious and malicious information and data, IDS can be a part of the software or a device. First is Detection of an attack then using different method to stop, Prevent an attack and disaster is the user's highest priority. Anomaly-based IDS satisfy their requirement and demand.In present scenario electricity theft isa major hurdle in front of government. This problem affects Indian economy. The loss on quantity of theft is mirrored in the electricity company.People are affording more charges because intruders steal electricity by many ways.

***Keywords*: -** Intrusion detection system, Anomaly based system, Electricity theft, Intruders.

I. INTRODUCTION

Using different techniques of detection we are just guaranteed sure levels of security and can't decide received information is actual and precise [5]. For security, we tend to use ADS (Anomaly based system) algorithms. ADS algorithms use the system status data knowledge received to make a decision whether the working of the system is reliable or not. So we tend to set up investigation of various ADS algorithms to dissect their conduct utilizing least knowledge to accomplish objective and check discovery ability [7]. Verification and privacy issue are solved with cryptographic arrangements and avoid integrity attacks. Checksums and Message Authentication Codes used for unmarked alterations of bundles in transmission. The goal hub disposes of the parcel if they got the bundle and also the code created by the message trait system does not coordinate. IDS techniques looking for signatures for database assault. An attack signature could be a succession of activities that are typically recorded in a security log. In the event that a grouping of events matches with known signatures then it will give an alarm. Within the event that a grouping of occasions matches with known marks then a caution has arisen. This type of detection is useful to acknowledge assaults with standard conduct or exceedingly dependable administrations. Intrusion detection methods ways looking for irregularities will acknowledge changes within the framework that don't coordinate the traditional or normal behavior. When we see towards the power distribution sector of our country then we will get to know that, a major part of power in getting theft in many manners. Now we could not do much to stop it. The old system is still as it is. In present time we are very much advance in automation technology then why not to use automation for electricity distribution. If we are implementing the automation technology in this field then we can get an amazing return and result both. So this was the major motivation behind this idea. If somebody steal electricity in a building then every honor that lives in that building have to pay extra money [10]. I choose this idea by comparative study of different idea of different authors. In this project present a comprehensive view of smart electricity meters and their utilization to remove intruders attack. We explain in brief that how to meter process and what technologies and software are used to increasing more security and reliability.

Ways of Theft:-

There are various types of electrical power theft include:-

Direct hooking from line

It is the maximum used approach for theft of energy. Eighty% of total energy theft anywhere in the global is done through manner of direct tapping from line. The customer taps into a direct energy distribution line from ahead of the electricity meter. This strength supply consequently is unmeasured in its consumption and procured without or with switches [3].

Bypassing the electromechanical meter

In this method the input terminal and output terminal of the energy meter has been shortened with a wire. So energy cannot be registered in the energy meter.

Injecting foreign element into the electromechanical meter:-Sometimes professional individuals inject foreign factors along with transistors, resistors or IC chips into the electric meter which reasons a lower consumption of power.

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Research articles

Electronic structure, magnetic and optical properties of Co_2TiZ (Z = B, Al, Ga, In) Heusler alloys

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ABSTRACT

Electronic structure, magnetic and optical properties of Co_2TiZ (Z = B, Al, Ga, In) Heusler alloys have been computed by density functional theory implemented in WIEN2k within generalized gradient approximation for exchange correlation functions. Lattices constants, bulk modulii, energy gaps, spin polarization and density of states have been calculated. Negative value of formation energy of these alloys evidences their stability. Spin polarization of Co_2TiZ (Z = Al, B, Ga, In) are 100%, 99%, 97% and 80% respectively and Co_2TiAl shows true half metallic ferromagnetism. Co_2TiZ, for Z = B, Al, Ga, shows stable half metallically over a wide range of pressure making them suitable for fabricating thin films for spintronics applications. Optical parameters such as complex dielectric function, refractive index, reflectivity, absorption, extinction coefficient, optical conductivity have also been calculated.

1. Introduction

In 1983, a new Heusler alloy, NiMnSb, was predicted by de Groot to be a half-metallic ferromagnetic [1]. Such materials, showing metallic behavior in one of the spin directions while semiconducting behavior for the other in electron density of states (DOS) are called half metallic ferromagnetic (*HMF*). Properties such as tunneling magneto-resistance (TMR), giant magneto-resistance (GMR), capacity to be used as spin valves and for spin injection in semiconductors [2–7] make materials which show *HMF* properties very attractive for fabrication of spintronics devices. Although Heusler alloys, with a formula X_2YZ, having a face centered cubic structure, have been studied for substitution of elements at X, Y and Z atomic positions [8–16], large possibilities still remain to tailor the electronic structure properties by substituting different elements.

Many alloys based on Co and Ti show *HMF* behavior. For example, Co_2YZ (Y = Ti, V, Cr, Mn, Fe and Z = Al, Ga) are being studied by various researchers due to formation of an ordered, single phase along which they are also half-metallic [17–21]. Among these, Co_2TiZ (Z = Si, Ge and Sn), alloys with potential for 100% spin polarization (SP) with half-metallicity and other properties such as enhanced Curie temperature, conductivity, saturation magnetization and Seebeck coefficient have attracted considerable attention [22]. Electronic structure calculations carried out using the self-consistent FPLAPW method by Dahmane for Ti_2ZAl (Z = Co, Fe, Mn) show them to be *HMF* in nature with band gaps of 0.65, 0.58 and 0.39 eV respectively [23].

Mechanical properties and evolution of magnetic properties under pressure in Heusler alloys with Boron as *sp* element such as Ni_2MnB, Co_2NbB and Ti_2CoB have been studied because of their high melting point, hardness and a high resistance to oxidation [24–26]. For actual realization of HM materials in spintronics based devices, these must be available in form of thin films or multilayers. However, depending on the substrate used, when these materials are cast in the form of multilayers or thin films, a change in the lattice constant can occur because of strain. Inter-atomic distances may be also changed by the application of pressure. In turn, these effects can be expected to modify the structural and magnetic properties as has been reported by several workers [27–29]. In the present work we report results of studies of the ground state electronic structure, magnetic properties and effect of pressure on the half metallic properties of Co_2TiZ (Z = B, Al, Ga, In) Heusler alloys using the full potential linearized augmented plane wave (FPLAPW) method in the WIEN2k code.

2. Computational details

The electronic structures of Co_2TiZ (Z = B, Al, Ga and In) were investigated by means of FP-LAPW method by using WIEN2k package. The energy threshold between the core and the valence states

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SOME INCLUSION RELATIONS ASSOCIATED WITH GENERALIZED FRACTIONAL INTEGRAL OPERATOR

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ABSTRACT. In this paper a known family of generalized fractional integral operator is used here to define some new subclasses of analytic function in the open unit disk U. For each of these new function classes, several inclusion relationships are established.

1. INTRODUCTION AND DEFINITIONS

Let $\mathbb{A}$ denote the class of functions f of the form

$$f(z) = z + \sum_{n=2}^{\infty} a_n z^n, \tag{1}$$

which are analytic in the open unit disk $U = \{z : z \in C \text{ and } |z| < 1\}$. If $f \in \mathbb{A}$ is given by (1) and $g \in \mathbb{A}$ is given by $g(z) = z + \sum_{n=2}^{\infty} b_n z^n$ in $z \in U$, then the Hadamard product (or convolution) of f and g is defined by

$$(f * g)(z) = z + \sum_{n=2}^{\infty} a_n b_n z^n.$$

Let $P_k(\alpha)$ denotes the class of functions $h(z)$ analytic in the unit disk U satisfying the properties $h(0) = 1$ and

$$\int_0^{2\pi} | \, Re\left(\frac{h(z) - \alpha}{1 - \alpha}\right) | d\theta \leq k\pi \qquad (z = re^{i\theta}; \quad 0 \leq \alpha < 1; \quad k \geq 2). \tag{2}$$

This class $P_k(\alpha)$ has been introduced in [7]. Note that for $\alpha = 0$, we obtain the class P_k defined and studied in [8] and for $k = 2$, we have the class $P(\alpha)$ of functions with positive real part greater than α. In particular, $P(0)$ is the class P

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The effect of CO_2 laser cutting parameter on Mechanical & Microstructural characteristics of high strength steel-a review

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Abstract

Cutting of sheet material is considered as an important process due to its relevance among products of everyday life as well as well as in high strength application in aircrafts, ships, cars, structures, military ,naval purpose etc. Based on recent study it is found that many high strength sheet martial are cut using CO_2 laser and it is important to know how the cutting is affecting the material properties and which parameters are responsible for such change. As steel is the most common type of material used in the manufacturing industry so the research is based on the different grade of steels and the effect on those when processed using CO_2 laser beam cutting. The various parameters and their effects are shown in the given study which is analyzed by different researchers along the course of time. The material, thickness and different optimization techniques by different researchers is also shown.

Selection and/or Peer-review under responsibility of Materials Processing and characterization.

Keywords: CO_2 LBC, Heat Affected Zone, Microstructural changes, Macro structural changes, Control parameters

1. Introduction

Abridgement of laser is "light amplification by stimulated emission of electromagnetic radiation" is used to produce a beam of monochromatic coherent light. Its property of spatial coherence allows laser to be focused on a small point which allows the laser to be used in many medical and industrial purpose .In manufacturing industry it is used in many applications ranging from small hole drilling, wielding to cutting of thick metal sheets with relative high tolerance and precision. Laser is considerably used in many fields as it doesn't require special medium like Vacuum or gas shielding for its operational purpose [1, 2]. Conventional cutting of sheet material carried out either by mechanical or thermal cutting (heat of flame or arc or beam).

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Synthesis, Characterization and Optical Properties of ZnSe Nanoparticles

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Abstract

The chemical co-precipitation method was employed to synthesize zinc selenide (ZnSe) nanoparticles with the help of Selenium powder, sodium borohydride, zinc acetate. Mercaptoethanol was added as capping agent. The XRD, SEM and TEM techniques were employed for the characterization of ZnSe nanoparticles. The average diameter of ZnSe nanoparticles is 15 nm. HR transmission electron microscopy (HRTEM) image displays the crystalline features of ZnSe nanoparticles. The PL emission spectrum indicates a peak centered at 480 nm along with two shoulders at 453 and 520 nm. The blue shift is also observed in the PL emission spectrum of ZnSe nanoparticles as compared to bulk ZnSe due to the quantum confinement, which is caused by direct band to band transition. Raman peaks at 210 cm^{-1} is assigned to the TO phonon modes of ZnSe phase, that correspond with the reported results for ZnSe.

Keywords: ZnSe nanoparticles , X-ray diffraction, Raman Spectroscopy, Photoluminescence

INTRODUCTION

The chalcogenides of II- VI materials viz ZnS, ZnSe, CdS and CdSe etc. are most studied and synthesized semiconductor nano-materials. Out of these, zinc selenide nano-materials are most noticeable due to their tune-ability over the visible range of the spectrum. Chalcogenide semiconductor nanomaterials having commercial interest due to their distinctive properties among the same material in bulk form. Nanomaterials with a defined size and shape have fascinated much interest due to the effect of size on physical, chemical and optoelectronic properties. Size dependent fluorescence spectrum of ZnSe nanoparticles helps to find applications in laser diodes, solar cells etc. It is also observed that engineers are able to manufacture laser diodes using these particles which cover most part of the electromagnetic spectrum.[1]. The nanoparticles of ZnSe was prepared by methods like hydrothermal , sonochemical , sol-gel, solvothermal routes, and vapor-phase, thin films, wet chemical route, and co-precipitation methods. Among these methods, the co-precipitation method is of particular interest because it is relatively simple, inexpensive and convenient.

There are considerable interest in the synthesis and characterization of ZnSe semiconductors consisting particles of 2-100 nm, which are generally referred as quantum dots and nanocrystals. The interests of the researchers are mainly because of their size-tunable optical, electronic and chemical properties [3,4]. Further miniaturization of optical and electronic devices leads to their commercial applications [1,4-9] are as diverse as solar cells, catalysis, biological labelling, light-emitting diodes. As we know that Size and shape of the nanomaterials are responsible for their properties but synthesis of stable monodispersed nanocrystals is still a great challenge in Nanoscience. The control of shape of nanocrystals is also very important .The correlation exists between the shape and the chemical, electronic, optical, physical, magnetic and catalytic properties of nanoparticles. Crystal growth kinetics controls the shape and size of nanocrystals. Therefore the Synthetic chemistry and crystallography provides plethora of opportunities to explore these interesting problems in nanoscience. In this research, it was proposed to synthesize the nano-particles of ZnSe nanocrystals by chemical route using the kinetically controlled precipitation method. The study of structural and optical properties of these chalcogenide nano-materials were studied.

EXPERIMENTAL DETAILS

Materials

The chemicals mainly used were zinc acetate ($Z_2C_4H_6O_4$), selenium (Se), mercaptoethanol, (C_2H_6OS), sodium borohydride ($NaBH_4$), and ethanol. All chemicals of high quality (Sigma Aldrich) were used.

Synthesis of ZnSe Nanoparticles

ZnSe nanoparticles were synthesized by the two steps chemical reaction using chemical co-precipitation method. Firstly, zinc acetate ($Z_2C_4H_6O_4$) was dissolved in distilled water with the help of continuous magnetic stirring, later the mercaptoethanol was added to it. Consequently selenium powder was used to prepare sodium hydrogen selenide (NaHSe) solution with the help of sodium borohydride ($NaBH_4$) and distilled water. This mixture was continuously stirred to get a colourless solution at low temperature. This solution was added to first solution with stirring and heated to

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Research articles

Spin polarization in Co_2CrAl/GaAs 2D-slabs: A computational study

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ABSTRACT

Co_2CrAl/GaAs slabs have been constructed to study the electronic structure and magnetic properties by Structeditor program implemented in WIEN2k Code. GGA and LDA parameterizations have been used for exchange correlation functions. The density of states, structure and magnetic parameters have been studied and analyzed. Co_2CrAl/GaAs (1 1 1) surface shows 80% spin polarization within LDA parameterizations. Variation in spin polarization with varying projections is observed due to different surface terminations and bond length. Effect of capping layers of Au and Cu on the magnetic moment and spin polarization of Co_2CrAl/GaAs for different surface projections has been studied. The DOS indicates that the spin polarization has enhanced for all surface projections within the GGA approximation for both capping layers. The magnetic moment also varies from the bulk value of $3\mu_B$ in Co_2CrAl/GaAs surfaces.

1. Introduction

Ab-initio study of Heusler alloy surfaces is an active area of research in the field of spintronics [1–3]. Although many materials have been identified to be half-metals in the bulk phase with a potential for 100% spin polarization, it is difficult to extract 100% spin polarization in surfaces of these materials due to two-dimensional/surface defects. Since these materials ultimately have to be in the form of thin films/multilayers to realize actual application in spintronics, it is important to establish the behavior and stability of these materials in the thin film/multilayer form on semiconductor based substrates. While most Co based bulk Heusler alloys show half metallic ferromagnetism if they stabilize in the highly ordered $L2_1$ structure and also show reasonable spin polarization on X-Y disordering, in the case of Co_2CrAl, nearly half-metallic behavior is retained even on Y-Z disordering. Spin polarization of about 84% is still realized on terminated (0 0 1) CrAl surface of Co_2CrAl [4]. Structural similarity between Heusler alloys such as Co_2CrAl and Co_2FeSi and the semiconductor GaAs surface favours the formation of stable structures compared to other alloys/metals on GaAs in which there is a considerable mismatch in the structures [5,6]. To determine reasonably accurate results of electronic structure properties in surfaces, it is important to understand the mechanism of interlayer spacing, bond length and bond angle. Dai et al. found that high spin polarization is induced in Co_2CrAl/Cr super lattices due to strong ferromagnetic exchange interaction at the Cr–Co interface [7]. Nagao et al. also investigated spin polarization in Co_2CrAl/GaAs surface free superlattice at (1 0 0) and (1 1 0) orientations and found high spin polarization in the case of (1 1 0) super lattice [8] without vacuum termination. The phase diagram obtained by ab initio atomistic thermodynamic studies of $Co_2Cr_{0.5}Fe_{0.5}Al$ (0 0 1) surfaces and its interfaces with GaAs (0 0 1) shows that the (0 0 1) CrAl surface is the most stable termination for this Heusler alloy [9] and that at ideal surfaces and interfaces with GaAs, half-metallicity of the alloy is lost although the CrAl surface retains high spin polarization. In this work we have investigated electronic structure and magnetic properties of Co_2CrAl/GaAs 2D slabs at all possible orientations and compared the results. A vacuum layer on top of the surface was used for reduction in dimensions. In this work we have also studied the effect of capping layer on spin polarization and magnetic moments since in real thin films/multilayers, capping layers are used as a protective layer to avoid the oxidation of metallic thin films [10,11]. However, capping layers also affect the magnetic and transport properties in thin films [12,13] and so it is important to understand the modification in physical properties on introduction of such a layer. We have thus investigated the effect of commonly used Cu and Au capping layers on spin polarization and total magnetic moment in Co_2CrAl/GaAs 2D slabs. Although the electronic and magnetic properties of bulk Co_2CrAl have been extensively studied, few theoretical ab initio studies of the 2D Co_2CrAl interfaces with GaAs surfaces with two-dimensional translational

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Research Article

THE THERMOREGULATORY ADVANTAGES OF HEAT STORAGE AND MIMICRY BEHAVIOUR OF KATYDIDS IN THAR DESERT

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ABSTRACT
Desert katydid (family Tettigoniidae) like *Microcentrum rhombifolium* is able to survive the harsh hot climate because of the specialized anatomical, physiological and behavioural adaptations such as coloration and mimicry. Heat transfer theory predicts that metabolic heat loss in this species mostly depend on the ability to radiate heat. To examine this, thermal imaging of desert katydids was reported at (27°51'5.80" N & 75°16'25.82" E) Seth G B Podar College, Nawalgarh. During different climatic conditions, most of the outer surfaces of the body were warmer than the surrounding high temperature zone. In such conditions, the wings were camouflaged as leaf like structures with vein and sub-vein surface. However, owing to the thermal conductivity of insect surface any heat transfer to the skin surface will be negligible. Future thermal imaging studies are likely to add to the knowledge of adaptations of this species in the harsh climate of desert.

Keywords: *Heat Sensitivity, Katydids, Coloration & Mimicry*

INTRODUCTION
Some predators identify prey by a relative difference in temperature of prey and its environment. Leaf feeding insects are green and have extremely flattened, leafy wings, and legs; they are usually about 5-6 cm long. Their wings often have venation similar to that of the leaves on which they live. The eggs of leaf insects are found scattered on the ground and hatch in the spring. The young resembles the adults except for their smaller size and reddish color; shortly after they begin feeding on leaves they turn green. The walking sticks of tropical and temperate climates are members of the same order. Leaf insects belong to the phylum Arthropoda, class Insecta, order Orthoptera, suborder Ensifera, super-family *Tettigonioidea*, and family *Tettigoniidea*. Insects in the family Tettigoniidae are commonly know katydids or bush crickets. Part of the suborder *Ensifera*, *Tettigoniidae* is the only family in the super-family Tettigonioidea. These are primarily nocturnal in habit, with strident mating calls, many katydids' exhibit mimicry and camouflage, commonly with shapes and colors similar to leaves in feeding and protecting time. The diet of *tettigoniids* includes leaves, flowers and seeds, but many species are exclusively predatory, feeding on other insects, snails, or even small vertebrates such as snakes and lizards. Some are also considered pests by commercial crop growers and are sprayed to limit growth, but population densities are usually low, so a large economic impact is rare.

Defense mechanisms of *tettigoniids* include going to rest during the day time; they go into a diurnal roosting posture to maximize their cryptic qualities. This position fools predators into thinking that either the katydid is dead or just a leaf on the plant. By flicking their wings open when disturbed they use the coloration to fool predators into thinking as if the spots are eyes. This in combination with their coloration, mimicking leaves which allows them to blend in with their surroundings. This also makes predators unsure about distinguishing front and back side of the insect (Castner and David, 2004).

Due to the exothermic nature of insects, metabolic rate is extremely dependent upon environmental temperature. Optimal growth and development of insects falls within a fairly broad range of temperatures. For example, for codling moth (*Cydia pomonella*) the range is between 10 and 30°C (Rock and Shaffer, 1983). Acute changes in temperature, as experienced in post harvest quarantine treatments, can elicit a range of metabolic responses. Some insects may increase anaerobic metabolism, as in non feeding larvae

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Physico-Chemical Characterization of Drinking Water of Jaipur City and Its Defluoridation by using Brick Powder (An Industrial Waste): A Green Approach

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ABSTRACT

In present study, fluoride ion concentrations in water were determined by employing SPANDS method. 'Green Chemistry' provides various tools and techniques including the ion-exchange, adsorption, reverse osmosis, precipitation and many more as some usual means of defluoridation. Then Brick powder (BP) used in defluoridation of water and it is use of these wastes serves two purposes solve as same time, one is low cost and eco-friendly defluoridation and other one is waste management. It is wastes found in brick area situated nearby Jaipur City of Rajasthan state. The dose of adsorbents, contact time and concentration of fluoride ions will be discussed with their interdependence. For this study, water sample taken from different zone were studied.

KEY WORDS: Fluoride, Brick powder, Analysis of study.

1. INTRODUCTION

Activated carbons and brick powder were the most important commercial adsorbents. Their high surface area (Rodriguez, 1991) together with their surface chemical structure allows them to have been used in industrial applications and some of the most important dealing with the environmental field. These are particularly with water purification and industrial wastewater cleaning (Bansal, 1988; Jankowska, 1991; Bernardo, 1997; Gaballah, 1999; El-Sheikh, 2002). In these are applications adsorption with activated carbon is most commonly used in removal of species.

The modern civilization, industrialization, urbanization are increase in population have been lead to the fast degradation of our ground water quality. As the water is the most important component of eco-system, any imbalance created either in term of amount and the presence of impurities added into whole eco-system (WHO, 1984; Kannan Krishnan, 1991; Hem, 1961).

Fluoride is a natural compound present in water, soils, plants and animals to be essential for life. A WHO experts committee (De, 2000) considered fluoride with 14 elements are essentially for animal life. WHO standards for drinking water fluoride is present range of between 0.5 – 1.5 mg/L. Fluoride concentration below and above are permissible limit have an implication related due to health and it is totally absent in water supply to cause dental carries.

De-fluoridations were reported by adsorption (Raichur, and Jyoti Basu, 2001) chemical treatment (Reardon and Wang, 2000; Saha, 1993), ion exchange (Singh et al, 1999), membrane separation (Dieye, 1998; Amer, 2001), electrolytic de-fluoridation (Mameri, 2001) and electro dialysis (Hichour, 2000; Hichour, 1999; Adikari, 1989) etc. Among various processes are adsorption reported to be effective (Venkata Mohan, 2002). Investigators reported are various types of adsorbents namely activated carbon, minerals, fish bone char coal, coconut shell carbon and rice husk carbon, with different degrees of success (Jayantha, 2004; Prabavathi, 2003; Srimurali, 1998; Muthukumaran, 1995; Killedar, and Bhargava, 1993; Sathish, 2007) reported that the fluoride adsorption by zirconium impregnated coconut fibre carbon (ZICFC). The adsorption rate is extremely rapid within 93% of the adsorption being achieved within 10 min of ZICFC contact for an initial fluoride concentration is 20mg L-1. (Saritha Sinha, 2003) reported that fluoride is removed by using the activated carbon prepared from E.crassipes. (Li, 2003) reported. The activated carbon loaded with alumina than successfully removed fluoride at a pH range of 6.0-9.0. (Gupta, 2007) reported that fluoride is removed at pH 7.58 by using carbon slurry. (Mohan, 2007) reported that fluoride is removed from the aqueous phase by absorption.

2. METHODS AND MATERIALS

Materials: The glassware are washed with nitric acid and distilled water before use. First, a stock solution are prepared by dissolving appropriate amount of sodium fluoride (NaF) in distilled water and desired concentrations of working solutions were then prepared from stock solution. Naturally abundantly available low cost materials like Bricks powder was obtained from a local kiln. The Bricks powder was washed several times with distilled water till clear water was obtained and dried in oven at 105 °C for 12 h. The dried material was sieved to obtain particles, of size 300 µm.

Experimental: Fluoride concentration was estimated by SPADNS (Trisodium-4, 5 Dihydroxy-3-(p-sulfophenylazo) -2,7-naphthalene disulfonic acid) method using a spectrophotometer.

FLUORIDE REMOVAL USING INDUSTRIAL WASTE: A CASE STUDY OF JAIPUR CITY

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ABSTRACT

'Green Chemistry' provides various tools and techniques including the ion-exchange, adsorption, reverse osmosis, precipitation and many more as some usual means of defluoridation. Batch adsorption studies were undertaken to assess the suitability of commercially available bricks powder used in fluoride-contaminated water. The effects of some of the major parameters of adsorption,viz, dose of adsorbent, contact time and initial adsorbate concentration on fluoride removal efficiency were studied and optimized. Maximum fluoride removal was observed to be 94% at optimum conditions. Freudlich as well as Langmuir isotherms were plotted and kinetic constants were determined.

Key Words: Fluoride, adsorption, Bricks powder, Freundlich isotherm, Langmuir Isotherm

INTRODUCTION

Many countries have regions and the water contains more than 1.5 mg/l of fluoride due to its natural presence in the earth's crust, or discharge by agricultural and industrial activities, such as steel, aluminium, glass, electroplating (Amor Z et.al,1998, Hasany SM, et.al, 1996, Cohen D, et.al, 1998). Precipitation of fluoride with calcium and aluminium salts (Saha S , 1993) has been used to remove fluoride from industrial wastewater. The chronic disease manifested by mottling of teeth in mild cases, softening of bones and neurological damage in severe cases (Wang Y, Reardon EJ,2001, Lounici H et.al,1997, Srimurali M et.al,1998, Hichour M et.al, 2000). Use of Marble Slurry Powder Waste for Defluoridation: A Case Study of Jaipur City (N.kumar et,al,2017.)

High fluoride levels in drinking water has become a critical health hazard of this century and induces intense impact on human health including skeletal and dental fluorosis (S. Ayoob; A.K. Gupta, 2006). Physico-chemical analysis of water of Jaipur city and its defluoridation by using brick powder and marble slurry powder: a green approach to utilize industrial wastes (N.kumar et,al,2016). Free fluoride level in drinking water was identified at 3.02 mg/L in Kadayam block of Tamilnadu (G. Alagumuthu , 2008). Fluoride survey in Nilakottai block of Tamilnadu and positive correlation between prevalence of dental fluorosis in children and levels of fluoride in portable water is 3.24 mg/L (G. Viswanathan et.al, 2008). Many natural and low cost materials such as red mud (Y. Cengeloglu et.al, 2002), (A. Tor et.al,2009), zirconium impregnated coconut shell carbon (R. Sai sathish et.al, 2007), cashew nut shell carbon (G. Alagumuthu et al, 2010), ground nut shell carbon (G. Alagumuthu , 2010) and clays (Ali Tor , 2006) have been used as adsorbents for fluoride removal from drinking water. Physico-Chemical Analysis of Ground Water of Difference Places in Jaipur City and its Defluoridation by using Marble Slurry Powder(N. Kumar et al, 2017).

Geographical Details of Rajasthan: Rajasthan is located in the north western part of the subcontinent. It is bounded on the west and northwest by Pakistan, on the north and northeast by the states of Punjab, Haryana, and Uttar Pradesh, on the east and southeast by the states of Uttar Pradesh and Madhya Pradesh, and on the southwest by the state of Gujarat. The Tropic of Cancer passes through its southern tip, in the Banswara district. The state has an area of 132,140 square miles (3,42,239 km2) and

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Use of Marble Slurry Powder Waste for Defluoridation: A Case Study of Jaipur City

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ABSTRACT

Large number of people are in rural areas are dependent on ground water for drinking purpose. The present study investigates the study of fluoride in the level of groundwater of different area in jaipur city of Rajasthan state and collecting from bore wells and hand pump. In the current research paper by employing SPANDS method, fluoride ion concentrations in water were determined spectrophotometrically at 570 nm. First and then marble slurry powder was used as adsorbents in defluoridation of water. In this paper, dose of adsorbents, contact time and concentration of fluoride ions will be discussed with their interdependence.

Keywords: Fluoride, marble slurry powder, Analysis of study area.

INTRODUCTION

The presence of fluorine in drinking water, are permissible limits of 0.5–1.0 mg L^{-1}, is beneficial for the production and maintenance of healthy bones, teeth and excessive intake of fluoride causes dental or skeletal fluorosis. The chronic disease manifested by mottling of teeth in mild cases, softening of bones and neurological damage in severe cases [1- 5]. Many countries have regions and the water contains more than 1.5 mg L^{-1} of fluoride due to its natural presence in the earth's crust, or discharge by agricultural and industrial activities, such as steel, aluminium, glass, electroplating [6 - 8]. Precipitation of fluoride with calcium and aluminium salts[9]has been used to remove fluoride from industrial wastewater. Then, aluminium salts are used to reduce the fluoride concentration [10]. The solubility of CaF2 is theoretically 8 mgL^{-1} fluoride at stoichiometric concentrations of calcium; and when a large dosage of calcium is used, the concentration of fluoride in water and the pH of treated water is at a relatively high value, resulting in a supplementary difficulty of eliminating excess chemicals [11].

Adsorption is another technique, in which fluoride is adsorbed onto a membrane, or a fixed bed packed with resin or other mineral particles. Many techniques have been reported, like reverse osmosis, electrodialysis, Donnan dialysis, ion exchange, limestone reactor and activated alumina column [12]. The efficiency of this technique mainly depends on adsorbents and ion exchange, electrodialysis and membrane processes are effective and can remove the fluoride to a suitable level, but they are expensive and require

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राजस्थान में अल्पकालीन एवं दीर्घकालीन सहकारी ऋण व्यवस्था के विकास में समस्याऐं

डॉ. संजय कुमार सैनी*

सार

सहकारिता आर्थिक संगठन की एक महत्वपूर्ण पद्धति मानी जाती हैं। इसका मूल सिद्धान्त 'एक सबके लिये तथा सब एक के लिये' होता है। आर्थिक दृष्टि से कमजोर व्यक्ति सहकारी संगठन बनाकर अपने आर्थित हितों को आगे बढ़ा सकते है। इसमें कोई सन्देह नही कि यदि सहकारी संस्थाओं को पर्याप्त कार्यकुशलता से संचालित किया जाये तो किसी भी प्रदेश का आर्थिक विकास अधिक तेजी से हो सकेगा, वहाँ के लोगों की आमदनी बढ़ेगी और उनका जीवन स्तर ऊँचा होगा। हमें यही भी स्मरण रखना होगा कि सहकारिता, लोकतंत्र व विकेन्द्रीकरण का परस्पर गहरा संबंध होता है। सहकारिता के विकास से लोकतान्त्रिक विकेन्द्रीकरण व पंचायती राज की स्थापना को बल मिल सकता है। इसलिए राजस्थान में सार्वजनिक क्षेत्र व निजी क्षेत्र के विकास के साथ साथ सहकारी क्षेत्र के विकास को भी पूरा महत्व दिया गया है। यह शोध पत्र राजस्थान में अल्पकालीन एवं दीर्घकालीन सहकारी ऋण व्यवस्था के विकास एवं विकास में आने वाली समस्याओं के बारे में अध्ययन पर आधारित है।

परिचय

हमारे देश में सहकारी बैंकिंग व्यवस्था का उद्‌गम 1904 में लगभग हुआ जबकि सहकारिता के सिद्धान्तों के आदर्शो पर नवीन प्रकार के संस्थान स्थापित करने के प्रयास प्रारम्भ हुए। यह प्रयास इस भावना से प्रेरित थे कि भारत जैसे विशाल देश में ही निहित है। सहकारी बैंकों की स्थापना से पूर्व भारतीय ग्रामीण क्षेत्रों में कृषि एवं संबंद्ध कार्यों हेतु साख सुविधाओं का अत्यन्त अभाव अनुभव किया गया। जब 1951 में भारत में आर्थिक नियोजन का युग प्रारम्भ हुआ तो सहकारी बैंक, इसकी सफलता हेतु प्रमुख उपकरण के रूप में उभरें। वर्तमान समय में कृषि एवं संबंद्ध कार्यो हेतु वित्त प्रदान वाली संस्थानों में सहकारी बैंकों का विशिष्ट स्थान है।

भारत में सहकारी साख संरचना के दो पक्ष है। एक पक्ष जिसमें अल्पकालीन व मध्यकालीन ऋण प्रदान करने वाला एक त्रि–स्तरीय ढ़ांचा है। जिसमें राज्य स्तर पर राज्य सहकारी बैंक, जिला स्तर पर केन्द्रिय सहकारी बैंक तथा ग्रामीण स्तर पर प्राथमिक कृषि साख समितियां कार्य करती है। दूसरा पक्ष दीर्घकालीन ऋण प्रदान करने वाला है, जिसके अन्तर्गत राज्य सहकारी भूमि विकास बैंक तथा प्राथमिक सहकारी भूमि विकास बैंकों द्वारा साख प्रदान की जाती है। पिरामिड के समक्ष उक्त संघीय सहकारी ढ़ांचे का प्रमुख उद्देश्य प्राथमिक समितियों को मजबूत बनाने के साथ प्रत्येक संस्था एक दूसरे से मुक्त करना है लेकिन प्रत्येक संस्था एक दूसरी पर निर्भर कर सकती है, श्रृंखला की सशक्तता प्रत्येक कड़ी की मजबूती पर निर्भर है, अतः प्रत्येक संस्था दूसरे स्तर की संस्था को वल प्रदान करती है। शीर्ष स्तर पर राज्य सहकारी बैंक जो राज्य में केन्द्रीय सहकारी बैंको तथा दूसरें राज्य स्तरीय बैंकों के लिए सन्तुलनकारी केन्द्रों तथा वित्त पोषण बैंकों का कार्य करते है। इनकी मुद्रा

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Physico-Chemical Characterization of Ground Water of Various Places in Jaipur City and Its Defluoridation by using Brick Powder: A Green Approach

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ABSTRACT

Large number of people in rural areas are dependent on ground water for drinking purpose. The present study investigates the study of fluoride in the level of groundwater of various places in Jaipur city of Rajasthan state and collecting of ten samples of different places in Jaipur city from bore wells and hand pump. In the current research paper by employing SPANDS method, fluoride ion concentrations in water were determined spectrophotometrically at 570 nm. First and then Brick powder (BP) was used as adsorbents in defluoridation of water. In this paper, dose of adsorbents, contact time and concentration of fluoride ions will be discussed with their interdependence Both the Langmuir and Freundlich adsorption isotherms fitted well for the fluoride adsorption on bricks powder with the regression coefficient of 0.99762 and 0.99766, respectively.

1. Introduction

Some new cost-effective fluoride adsorbents, such as, zeolites [1], natural adsorbent [2], low cost adsorbent [3] and biomass material, as well as other novel adsorbents [4] have been identified in last few years. The level of fluoride in the underground water of Newai region was exceeding the permissible limit (>1.5 mg/L). It was found that about ten villages of Newai region was under serious fluoride contamination than bore well and hand pump water which causes adverse effect like dental and skeletal fluorosis [5]. It has been demonstrated that bio-sorption is good at affinity and selectivity for ion removal [6]. The ground water forms a major source of drinking water in urban as well as in rural areas [7]. The effects of major parameters of adsorption like dose of adsorbent contact time and initial adsorbate concentration on fluoride removal efficiency were studied [8]. Phulera tehsil is facing the problem of groundwater pollution and determination of fluoride in ground water of Phulera tehsil [9]. The fluoride in ground water was studied in Amber tehsil of Jaipur district in 25 villages and were under surveillance [10].

A study of the water quality condition of Tonk district was carried out to assess the risk to human health and physico-chemical analysis of ground water sample [11]. The study has been focusing on the technique of defluoridation by using the process of electro-coagulation and ground water collected from Shivdaspura Jaipur [12]. The study has been carried out to assess the ground water quality and its suitability for drinking purpose in most rural habitations of Bassi tehsil of Jaipur [13].

The high fluoride levels in drinking water and its impacts on human health have increased the importance of defluoridation studies [14].

Nalgonda technique developed by NEERI is commonly preferred at all levels because of its low price and ease of handling [15]. Various processes tried so far for the removal of excess fluoride from water are adsorption, ion exchange, precipitation, and membrane process. Adsorption is the process considered to be efficient to defluoridation of the water. Researches were carried on different adsorbents, viz. activated carbon, processed bone char powder, activated alumina, magnesia, activated bauxite, fly ash, granular calcite, alum, lime, etc., [16-19].

In adsorption method, different types of adsorbents are being used for defluorination and removal of other minerals, dyes and heavy metals e.g. activated alumina [20], coconut shell carbon [21], baggase [22], chemically activated carbon [23], bone charcoal [24], natural zeolites [25], burn clay [26], crushed clay pots [27], electrodialysis [28] and other low cost bioadsorbents like saw dust [29], used tea leaves, cow dung [30] have been found to be highly effective, cheap and eco-friendly.

2. Experimental Methods

2.1 Materials

The glassware were washed off with nitric acid and distilled water before use. First, a stock solution of 100 mg/L was prepared by dissolving appropriate amount of sodium fluoride (NaF) in distilled water and desired concentrations of solutions were then prepared from stock solution. Naturally occurring and abundantly available low cost materials like Bricks powder was obtained from a local kiln and the material passing through 300 µm was used in all experiments. The Bricks powder was washed several times with distilled water till clear water was obtained and dried in oven at 105 °C for 12 h. The dried material was sieved to obtain particles, of size 300 µm for the present study.

2.2 Experimental Methodology

Adsorption studies were conducted to study the effect of controlling parameters like contact time, adsorbent dosage. All the experiments were conducted at room temperature. Fluoride concentration was estimated by SPADNS method using a spectrophotometer.

Ground water samples collected from various places of Jaipur city were studied for defluoridation under the feasible optimized conditions to check the suitability of the bricks powder adsorbent under field conditions. The physico-chemical properties of ground water samples were determined before and after treatment by Brick powder.

3. Results and Discussion

On physico-chemical characterization of the water samples collected from various location of Jaipur city, we have interesting changes in the values of different parameter including pH, EC, TDS, total alkalinity, total hardness, chlorides ions and fluoride, before and after brick powder as an adsorbent. The values before treatment and after treatment are summarized in Tables 1 and 2.

3.1 Comparison of pH of the Solution Before Treatment and After Treatment

pH is important indication of water quality and it is depend on H+ ions concentration in ground water. The pH is maximum in main Jagatpura site (9.4) and lower level at Bajaj nagar site (8.0) (Fig. 1a).

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Study of the Electronic Structure Properties in Co_2NbIn/Sn Heusler Alloys

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Abstract. Structural, electronic and magnetic properties of full-Heusler Co_2NbIn and Co_2NbSn compounds using density functional theory (DFT) have been studied. Lattice parameters obtained by volume optimization are 6.175Å and 6179Å for Co_2NbIn and Co_2NbSn respectively. Results suggest that Co_2NbIn to be a half-metallic material with a gap of 0.58 eV at the Fermi level in the minority states while Co_2NbSn has ferromagnetic behavior. The calculated magnetic moments are $2.00\mu_B$, $1.97\mu_B$ for Co_2NbIn and Co_2NbSn. Formation energy and elastic parameters results suggest that both are energetically and elastically stable.

INTRODUCTION

Many Co based full Heusler alloys are well known for spintronics applications, since they possess high spin polarization and high Curie temperature as compared to other transition metal based Heusler alloys [1-4]. Co atoms mainly carry the magnetic moment in Co-based Heusler alloys except in Mn based systems [5]. Half metallic ferromagnetic properties may also betailored by inducing selective disorder and varying compositions. Some reported interesting results related to phase transition and magnetic properties of Co_2NbSn full Heusler alloy [6, 7] have motivated us to do electronic structure calculation on Co_2Nb based systems. In this work we have made a comparative study of the electronic structure properties of Co_2NbIn along with Co_2NbSn using linearized augmented plane wave method implemented in WIEN2k. To our knowledge no one previously reported the electronic structure properties of Co_2NbIn. Wolter et al have carried out experimental and theoretical studies on Co_2NbSn and have reported it to be ferromagnetic with magnetic moment $1.97\mu_B$ [6].

COMPUTATIONAL METHODOLOGY

We have used WIEN2K code based on full-potential (linearized) augmented plane-wave ((L)APW) + local orbitals (lo) method that allow calculations to determine the electronic structure of solids using density functional theory (DFT). The Perdew Burke Ernzerhof reported parameterization of the generalized gradient approximation (GGA) has been used to treat the exchange and correlation function. Nonspherical contributions to the charge density and potential within the MT spheres were considered up to l_{max}= 10. The cutoff parameter is $R_{mt}.K_{max}$ = 7. Number of k-points for self consistent field cycles is about 3000. The charge density and the potential are expanded as a Fourier series with wave vectors up to G_{max} = 12 a.u. The MT radii (RMT) values are assumed to be 2.50 a.u., 2.45 a.u., 2.50 a.u. and 2.50a.u. for Co, Nb, In and Sn atoms, respectively. The charge and energy convergence was set to 0.00001Ry. In order to do computational calculations in Co_2NbIn/Sn, we have used a crystal structure as shown in Fig 1(a). Here Co atoms occupy X (0.25, 0.25, 0.25) and X' (0.75, 0.75, 0.75) atomic positions, Nb atom occupies Y (0.5, 0.5, 0.5) while (In/Sn) atom occupies Z (0, 0, 0) position.

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Stability of Half-metallic Behavior with Lattice Variation for $Fe_{2-x}Co_xMnAl$ Heusler Alloy

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Abstract. The electronic structure and magnetic properties with variation of lattice constant for $Fe_{2-x}Co_xMnAl$ Heusler alloys have been studied. Total magnetic moments predicted by the Slater Pauling rule is maintained over a wide range of lattice variation for the series. Half metallic ferromagnetic nature with 100% spin polarization is observed for a lattice range from 5.40-5.70 Å, 5.35-5.55 Å, 5.30-5.60 Å and 5.25-5.55 Å respectively for x = 0.5, 1.0 1.5, 2.0. Due to the stability of half metallic character for a wide range of lattice parameters, these alloys are promising, robust materials suitable for spintronics device applications.

INTRODUCTION

Heusler half-metallic ferromagnets with high spin polarization have promise for application in devices acting as spin valves and magnetic tunneling junctions (MTJs). Moreover, presence of a gap or even a pseudo-gap in the minority spin band suppresses the spin-flip scattering to a good extent. Co based Heusler alloys and their films are very promising for spintronics based device applications due to their half metallic nature. They also possess high magnetic moment and high Curie temperature [1-3]. Co_2MnAl films with $L2_1$ structure have recently also been demonstrated as suitable for applications such as high-sensitivity Hall sensor [4]. Our previous studies of the electronic structure, magnetic and optical properties of $Fe_{2-x}Co_xMnAl$ full-Heusler alloys show that these alloys exhibit half metallic behavior for x = 0.5, 1.0 and 1.5 [5]. In this study, we have analyzed the magnetic moment, spin polarization and band gap with respect to variation of lattice constant to check the structural robustness of these alloys.

COMPUTATIONAL DETAILS

Density functional theory based code was used to calculate the electronic structure and magnetic properties of $Fe_{2-x}Co_xMnAl$ Heusler alloys. Full potential linearized augmented plane wave (FP-LAPW) method and generalized gradient approximation (GGA) was used for the exchange correlation correction function implemented in WIEN2k code. The energy threshold between the core and the valence states was set to −6.0 Ry, $R_{MT} \times K_{max}$ set to 7 and Fourier expansion (G_{max}) was 12 (a.u.)$^{-1}$. The self consistency force convergence criterion for energy and charge was set to 10^{-4} Ry and 10^{-4} e respectively and the Brillouin zone integration of 3000 k-points were taken.

RESULTS AND DISCUSSION

In an earlier study we have observed that Fe_2MnAl does not show half metallic behavior at equilibrium lattice constant and hence to achieve higher spin polarization and half metallicity we have doped Co at Fe site in this alloy. Co doping improves the spin polarization for x = 0.5, 1.0 and 1.5 in $Fe_{2-x}Co_xMnAl$ to 100, 99, 99% respectively at equilibrium lattice constant [5]. Hence it is important to study how the uniform lattice distortion affects the half

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First Principles Investigations of Fe_2CrSi Heusler Alloys by Substitution of Co at Fe Site

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Abstract. Electronic structure and magnetic properties of $Fe_{2-x}Co_xCrSi$ Heusler alloys have been investigated by varying Co concentration from $x = 0$ to 2. On increasing Co concentration, lattice constant and magnetic moment of $Fe_{2-x}Co_xCrSi$ alloys increase. These alloys show true half metallic Ferromagnetic behavior with 100% spin polarization. Band gap of the alloys also increase from 0.54 eV to 0.85 eV on increasing Co concentration making these alloys promising materials for spintronics based device applications.

INTRODUCTION

Half-metallic ferromagnets (HMF), which have presence of an energy gap at the Fermi level in one spin and metallic character in the other have attracted much attention due to their spintronics devices applications. High Curie temperature for HMF is an important condition for this purpose which is mostly realized in Co-based Heusler alloys [1, 2]. Studies on $Fe_{2-x}Co_xVAl$ and $Fe_{2-x}Co_xMnAl$ series indicate that Co substitution on Fe site affects the half-metallicity, spin polarization and magnetic properties [3, 4]. In this paper, we have discussed the effects of substitution of Co for Fe, on the electronic structure, magnetic moments and half metallicity in the series $Fe_{2-x}Co_xCrSi$ for $x = 0, 0.5, 1, 1.5, 2$.

COMPUTATIONAL DETAILS

The electronic structures and magnetic properties of $Fe_{2-x}Co_xCrSi$ Heusler alloys have been calculated using the WEIN2k code based on the FP-LAPW method. The Perdew-Burke-Ernzerhof formulation of the generalized gradient approximation was used in calculations of the exchange and correlation potentials. The values of energy threshold between the core and the valence states, $R_{MT} \times K_{max}$, l_{max} and G_{max} have been taken to be −6.0 Ry, 8.5, 10 and 12 $(a.u.)^{-1}$ respectively. The energy and charge convergence criteria were set to 10^{-5} Ry and 10^{-3} e respectively.

RESULTS AND DISCUSSION

Geometry optimization for $Fe_{2-x}Co_xCrSi$ ($x = 0, 0.5, 1, 1.5, 2$) has been performed for ordered $L2_1$ structure and the obtained equilibrium lattice constants, corresponding total energies, Bulk modulii and its pressure derivatives are reported in Table 1. A small increase in the lattice parameter with increase in the concentration Co is observed in accordance with Vegard's law since the Co atom has a larger atomic size as compared to Fe along with a decrease in the bulk modulus except for Fe_2CrSi. Stability for these alloys has been checked by calculating the formation energy ($E_{formation}$) using the following equation:

$$E_{formation} = E_{Fe_{2-x}Co_xCrSi} - (2-x)E_{Fe} - xE_{Co} - E_{Cr} - E_{Si} \quad (1)$$

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Biodeterioration of Cultural Heritage and Indigenous Methods Used for Preserving Cultural Heritage

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Abstract

The world is full of cultural heritage of all kinds. A large number of monuments, artefacts and manuscripts spread all over the world are finest example of rich cultural heritage and a symbol of men's cultural identity and continuity. Cultural heritage is unique and irreplaceable, which places the responsibility of preservation on the present generation. The different types of deterioration of heritage collection are reflected in wear and tear, shrinkage, cracks, brittleness, warping, bio-infestation, discoloration, abrasion, holes, dust, and dirt accumulation etc. The ravages of time, and extreme climatic conditions such as changes in temperature, humidity, intensity of light or even ignorance and most important biological agents, often destroyed priceless cultural property and records. It is therefore imperative that measures be taken at the earliest and in time to save and preserve these culture and heritage for posterity. The research work undertaken for an understanding of morphological and physiological characteristics of biological agents, required to identify accurately the biological species that have established themselves on the surface or within the material. With the exact characterization of the organisms, it is also necessary to assess the cause-effect of biodeterioration action of a specific identified biological agent. The identification of the microorganisms on the materials and further understanding of their involvement and causes in biodeterioration of art objects and manuscripts have to be evaluated to find possible measure to prevent and successfully solve the associated problems and restore our Cultural Heritage. Traditional Indigenous methods for conserving cultural method is seem beneficial as it did not have any side effect on the materials and also the cheap and best way in this fields. During the experiments it is observed that traditional way gives wonderful results in increase resistance development and prevent the growth of microorganisms on the surface.

Keywords: Traditional; Indigenous; Cultural Heritage.

Introduction

Heritage exists at different levels. We can say that humanity as a whole has inherited as a culture which may be called human heritage. Every nation also inherits a culture which may be termed as national cultural heritage. Cultural heritage includes all those values of culture transmitted to human beings by their ancestors from generation to generation. These cultural heritages are cherished, protected and maintained by them with unbroken continuity and they feel proud of it. The Taj Mahal, Sun Temple Konarak, Jagannath Temple, Puri, Lingaraja Temple, Bhubaneswar, Red Fort of Agra, Delhi's Qutub Minar, Mysore Palace, Jain Temple of Dilwara (Rajasthan) etc., are all important places of our heritage and are to be protected by all means. Besides the architectural creations, monuments, material artefacts, the intellectual achievements, philosophy, treasures of knowledge, scientific inventions and discoveries are

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Physico-Chemical Analysis of Ground Water of Difference Places in Jaipur City and its Defluoridation by using Marble Slurry Powder

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Abstract : The many number peoples are dependent on ground water for drinking purpose in rural areas andPotable safe water is absolutely essential and is the basic need of all human beings on the earth. The present study investigates are fluoride in the level of groundwater of various places are difference in jaipur city of Rajasthan state. The collecting of eight samples of different places in jaipur city from bore wells and hand pump. In the current research paper by employing SPANDS method, fluoride ion concentrations in water were determined spectrophotometrically at 570 nm. first and then marble slurry powder (MP) was used as adsorbents in defluoridation of water. In this paper, dose of adsorbents, contact time and concentration of fluoride ions will be discussed with their interdependence.
Keywords : Fluoride, marble slurry powderpowder, Analysis of study area.

Introduction

"Water is life's matter and matrix, mother and medium. There is no life without water".Potable safe water is absolutely essential and is the basic need of all human beings on the earth. Due to rapid industrialization and subsequent contamination of surface and ground water sources, water conservation and water quality management have now a day's assumed a very complex shape. In Rajasthan water is not only saline, but it also contains many dissolved substances, due to which water is not suitable for drinking. These substances have either the toxic effects on the consumer or have long terms indirect effects[1-4].

All the 33 districts of Rajasthan have been declared as fluorososis prone areas. The worst are- Nagaur, Jaipur, Sikar, Jodhpur, Barmer, Ajmer, Sirohi, Jhunjhunu, Churu, Bikaner, Ganganagar etc.[5,6].

Nitrate is also one of the most common groundwater contaminants in the Districts of Rajasthan have been reportedconcentration more than 45 mg/L[7].In Amer, Bassi, Chomu, JamwaRamgarh, Kotputali, Shahpura and Virat Nagar tehsils of Jaipur district there is the problem of high fluoride and nitrate concentrations in groundwater[8].The state has extreme climatic and geographical condition and it suffers both the problems of quantity and quality of water[9,10,11].

In the study area there are no major surface water sources, however; the main sources of drinking water are open wells, hand pumps and bore wells[12,13].

In Bassi Tehsil 84 villages are reported to have fluoride concentration more than 1.5 ppm, 78 villages are exhibiting nitrate concentration more than 45 ppm and 30 villages are having Electrical conductivity more than 3000 micromhos/cm[14,15]. All the samples were analyzed for the following Physico-chemical parameters:

Satyendra Singh

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Principal
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Stability of Half-metallic Behavior with Lattice Variation for $Fe_{2-x}Co_xMnAl$ Heusler Alloy

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Abstract. The electronic structure and magnetic properties with variation of lattice constant for $Fe_{2-x}Co_xMnAl$ Heusler alloys have been studied. Total magnetic moments predicted by the Slater Pauling rule is maintained over a wide range of lattice variation for the series. Half metallic ferromagnetic nature with 100% spin polarization is observed for a lattice range from 5.40-5.70 Å, 5.35-5.55 Å, 5.30-5.60 Å and 5.25-5.55 Å respectively for x = 0.5, 1.0 1.5, 2.0. Due to the stability of half metallic character for a wide range of lattice parameters, these alloys are promising, robust materials suitable for spintronics device applications.

INTRODUCTION

Heusler half-metallic ferromagnets with high spin polarization have promise for application in devices acting as spin valves and magnetic tunneling junctions (MTJs). Moreover, presence of a gap or even a pseudo-gap in the minority spin band suppresses the spin-flip scattering to a good extent. Co based Heusler alloys and their films are very promising for spintronics based device applications due to their half metallic nature. They also possess high magnetic moment and high Curie temperature [1-3]. Co_2MnAl films with $L2_1$ structure have recently also been demonstrated as suitable for applications such as high-sensitivity Hall sensor [4]. Our previous studies of the electronic structure, magnetic and optical properties of $Fe_{2-x}Co_xMnAl$ full-Heusler alloys show that these alloys exhibit half metallic behavior for x = 0.5, 1.0 and 1.5 [5]. In this study, we have analyzed the magnetic moment, spin polarization and band gap with respect to variation of lattice constant to check the structural robustness of these alloys.

COMPUTATIONAL DETAILS

Density functional theory based code was used to calculate the electronic structure and magnetic properties of $Fe_{2-x}Co_xMnAl$ Heusler alloys. Full potential linearized augmented plane wave (FP-LAPW) method and generalized gradient approximation (GGA) was used for the exchange correlation correction function implemented in WIEN2k code. The energy threshold between the core and the valence states was set to −6.0 Ry, $R_{MT} \times K_{max}$ set to 7 and Fourier expansion (G_{max}) was 12 (a.u.)$^{-1}$. The self consistency force convergence criterion for energy and charge was set to 10^{-4} Ry and 10^{-4} e respectively and the Brillouin zone integration of 3000 k-points were taken.

RESULTS AND DISCUSSION

In an earlier study we have observed that Fe_2MnAl does not show half metallic behavior at equilibrium lattice constant and hence to achieve higher spin polarization and half metallicity we have doped Co at Fe site in this alloy. Co doping improves the spin polarization for x = 0.5, 1.0 and 1.5 in $Fe_{2-x}Co_xMnAl$ to 100, 99, 99% respectively at equilibrium lattice constant [5]. Hence it is important to study how the uniform lattice distortion affects the half

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Structural and Thermal properties of ion beam irradiated polystyrene/ZnO nanocomposite films

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Polystyrene/ZnO nanocomposite (PS/ZnO) thin films were prepared by the solution mixing method and irradiated with 55MeV carbon ion beam at various ions fluences ranging from 3×10^{11} to 3×10^{13} ions/cm^2. The structural and thermal properties of swift heavy ions (SHI) beam on irradiated films were studied by several characterization techniques such as Scanning Electron Microscopy (SEM), X-ray diffraction (XRD), Differential Scanning Calorimetry (DSC) and the dielectric setup with LCR meter. The SEM measurement showed the uniform dispersion of ZnO nanoparticles in Polystyrene solution. The XRD pattern indicated the presence of ZnO nanoparticles in nanocomposite thin films. The increasing ions fluences significant loss of average crystallite size, percentage of crystallinity, glass transition temperature (T_g) and thermal stability were observed for many applications such as unique optical, mechanical and electrical properties. The dielectric loss, A. C. conductivity and dielectric constant were also increased with increasing values ions fluences.

KEYWORDS: PS (Polystyrene), Nanocomposite, XRD (X-Ray Diffraction), DSC (Differential Scanning Calorimetry) and T_g (Glass Transition Temperature).

INTRODUCTION

Swift heavy ions beam irradiation is the most effective method to modify the chemical, electrical, optical, mechanical etc. properties of polymer nanocomposite materials [1-4]. Now a days organic polymers and inorganic nanoparticles polymer matrix drawn great attention due to their many fold applications in electronics, microelectronics, cables, capacitors, power tools handles, safety jackets, electronic packing materials and sensor devices [5-7]. In recent decades considerable interests in polymer-nanocomposite films arose due to their joint combination of electrical, optical, mechanical and physical properties. The joint properties of polymer-nanocomposite are greatly dependent on the properties like miscibility and phase behavior. The effects of ions beam or others source of irradiations in polycarbonate or polystyrene or polymeric thin films have been investigated by many researchers however effect of ions beam, electrons, protons, gamma rays and laser irradiation on polymer-nanocomposite films has rarely reported [8-10].

SAMPLES PREPARATION

PS pellets obtained from Redox and ZnO nanoparticles of size less than 100 nm were obtained from Sigma–Aldrich (India). Benzene was supplied by Merck Pvt. Ltd. (India). PS/ZnO nanocomposite films were prepared by solution mixing method. The detailed method for nanocomposite films preparation and ions beam irradiation were reported in our earlier publications [11-19].

ELECTRODE PREPARATION FOR DIELECTRIC MEASUREMENT

The samples having diameter 5 cm. and thickness 25 čm were prepared for good ohmic contact. Both the surfaces of nanocomposite films were vacuum aluminized using Vacuum Equipment Delhi. Vacuum coating unit with Penning and Pirani pressure gauges over central circular area of diameter 3 cm. on both sides vacuum aluminized samples have been used for electrical conductivity measurements.

The electrical measurements eg. dielectric constant, dielectric loss and A. C. conductivity of PS/ZnO nanocomposite films were determined by measuring their capacitance. Simultaneously, the loss factor was also measured. Capacitance and dielectric loss measurements were carried out using a parallel plate configuration of electrodes on both sides of PS/ZnO nanocomposite films by the LCR meter in the frequency range of 1–4.5 MHz at room temperature. The measured values of capacitance then have been converted into dielectric constant and A. C. conductivity.

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JOURNAL OF TOURISM AND HOSPITALITY

Institute of Tourism & Hotel Management
Dr. Bhimrao Ambedkar University, Agra

SAAN ART: Reflection of Cultural Heritage of Rajasthan Need to Be Preserved

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Abstract:

India is well known for its cultural heritage of different kinds around the globe, are finest example of rich cultural heritage and a symbol of India's cultural identity. Large number of monuments, artefacts and other example of fine arts spread all over India. As Cultural heritage is unique and irreplaceable, this is the responsibility of the present generation for preservation. Rajasthan is a Hub of Folk art, theatre, music, dance and craft and famous for its culture, traditions, Painting and Craft work to all over the world. Nobles of Rajasthan were patrons of art and encouraged their tradition and always promote them. There are so many famous form of art namely miniature paintings, patachitra, wood-block printing, madna etc. SAAN is an ancient Rajasthani art that developed during the Mughal Era, after the innovation of Mirror. After 16th and 17th century a unique art form was taken shape in Rajasthan's forts and temples, the artists of that era gave their lots of efforts to develop Mirror art, this beautiful carved art developed and became famous in that time. But in the present scenario SAAN art is struggling for its identity. Begri family, settled in Kota for so long is working to bring the Saan Art to the notice of common people and for continuity of this beautiful art form. The family follows the same tradition of the Saan Art which was followed by their forefathers 300 years ago. This art faces problems regarding the availability of the raw material required for the painting and the art lover who appreciate their work. It is the responsibility to state government as well as people to connect with the art work to promote such kinds of art to give them a new direction. This art also be the attraction point to the tourists which also help to promote the tourism industry in that parts of the country. As it is observed in several part of the world trips are more memorable if they include a heritage activity where they learn something from others Arts, cultures, Traditions etc.

Keywords: Saan Art, Begri Family, Rajasthan, Mirror Art,

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JOURNAL OF TOURISM AND HOSPITALITY

Institute of Tourism & Hotel Management
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Awareness about Cultural Heritage: A Key to Sustainable Tourism

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Abstract

A large number of monuments, artefacts and manuscripts spread all over the world are finest example of rich cultural heritage and a symbol of men's cultural identity and continuity. Cultural heritage is unique and irreplaceable, which places the responsibility of preservation on the present generation. Heritage exists at different levels. We can say that humanity as a whole has inherited as a culture which may be called human heritage. Every nation also inherits a culture which may be termed as national cultural heritage. Cultural heritage includes all those values of culture transmitted to human beings by their ancestors from generation to generation. These cultural heritages are cherished, protected and maintained by them with unbroken continuity and they feel proud of it. The Taj Mahal, Sun Temple Konarak, Jagannath Temple, Red Fort of Agra, Delhi's Qutub Minar, Mysore Palace, Jain Temple of Dilwara, Bibi ka maqbara, Palaces of Rajasthan and other cities etc. are all important places of our heritage and are to be protected by all means. Many of time it is observed these cultural heritages lost its beauty and importance due to deterioration caused by environment, biological agents, and ravages of time as well as negligence of mankind. For promote sustainable tourism it is necessary to aware the people about the importance of cultural heritage for nation as well as individuals. For any country like India tourism play a significant role in economy of country. Sustainable cultural heritage tourism now the time very significant role in creating tangible outcomes such as job creation, tax revenues and another outcomes i.e. quality of life.

Keywords: Cultural heritage, Awareness, Deterioration, Preservation,Cultural tourism.

Introduction

Tourism has extensive economic, social and political influence almost everywhere in the world During the past decade, cultural tourism has proved itself being the fastest growing aspect of tourism and it is predicted that in the coming years it "will only continue to grow as tourists become more sophisticated and as more people can afford to travel globally." Cultural

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MINERAL RESOURCES IN RAJASTHAN: THEIR DEPOSITS AND PRESENT POSITION IN ECONOMY OF STATE

Dr. Sanjay Kumar Saini*

ABSTRACT

Economy of Rajasthan is recognized as a developing economy. Rajasthan is located in north-western part of India. It is largest state in the country with an area of 3,42,239 sq. km. encompassing about 11% of the total geographical area of the country. Infrastructure development is essential to overall development of economy of the state. At present minerals is most important component of infrastructure. A mineral is a naturally occurring, inorganic substance with a definite chemical composition and a crystalline structure. Rajasthan is a largest state of India. It boasts the three natural heritages: The Arravalli Mountain Range, The Thar Desert and The Minerals. The state is a big treasure trove of mineral of indescribable qualities. Rajasthan is blessed with 79 varieties of minerals. Markedly the area of under mining is approximately 1,846 sq. km. which is only 0.54 of total land cover in the state. The state has virtual monopoly in the production of minerals like Lead-Zinc, Gypsum, Soap Stone, Ball Clay, Calcite, Rock Phosphate, Feldspar, Copper, Jasper, Garnet, Wollastonite, Silver etc. The state is proud to posses huge reserves of Lignite, Crude Oil and High Quality Gas. It is also renowned for its deposits of Marble, Sand Stone and some unique decorative stones. Mining is not only a major source of employment in the rural and tribal area of the state, but also a major source of revenue to the Government and minerals playing an important role in the development of the state. In this context, this paper covers deposits of various minerals, mineral fuels and their position in state.

KEYWORDS: *Developing Economy, Infrastructure Development, Natural Heritages, Mineral Fuels.*

Introduction

Rajasthan has been regarded as a 'Museum of Minerals'. Rajasthan possesses a variable range of mineral deposits in India. Rajasthan ranks next to Jharkhand in the matter of availability of minerals. The total number of minerals occurs in Rajasthan is 79, out of which 58 are being commercially exploited. Its share is 9% in the country's total mineral production. The state is the sole producer of Garnet, Jasper, Selenite and Wollestonite. The state has monopoly in production of Lead-Zinc, Silver, Cadmium, Marble, Precious and Semi-Precious stones. Some other significant minerals of the state are Copper, Silica and Quartz, Cement, Mica, Barytes, Pyrophylite, Fluorite, Graphite and Bentonite, Asbestos, China Clay, Dolomite, Magnesite, Rock-Phosphate, Soapstone etc. The lack of Coal and Iron-Ore not only hindered the state in mining industries in the past, but it will have influenced even in its future development. Income from mining sector was Rs. 7,300 crore at 2004-05 prices, which was 3.70 % of Net State Domestic Production of the year 2011-12. The mineral sector provides direct employment to 5.06 lakh people and indirect employment to more than 20 lakh people in the secondary and tertiary sectors. Rajasthan ranks first in the production of minor minerals by contributing 30 % share of the national production. The state ranks 5th in terms of the value of major minerals produced in the country. The petroleum sector has started giving huge revenues to the state and touched a level of 5,300 crores in 2014-15. The following table shows the minerals found in Rajasthan which account for 70 % or more of India's total production:

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Quantitative analysis of fluoride in ground water in Nawalgarh, Jhunjhunu (Rajasthan)

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Abstract: Ground water contains various types of pollutants and several other substances, which are dissolved in it. Presence of these elements are useful for human body but in a specific limit. A study of the ground water quality of Nawalgarh area of Jhunjhunu district was carried out to assess the risk to human health. It was found that ground water of Nawalgarh area is highly contaminated with fluoride (Mean value 2.6±0.06). Most of the ground water samples were found to be highly contaminated with fluoride while few water samples were suitable for human consumption. The result of this study helps in getting awareness of health hazards of contaminated water. Overall, the quality of water is unsatisfactory for drinking purpose in the investigated area.

Key words: Ground water, Fluoride

INTRODUCTION

Water is the most important thing for the perpetuation of life on this planet. Good quality of water is essential for all the people. WHO has given a set of guideline values for drinking water quality[1]. Total 98% of the planet Earths water is in the Oceans, remaining 2% is fresh water, but 98% of, which is stored in ice caps at the poles. In other words only 0.04% of water is available for human being use. Ground water is the important source for irrigation and drinking purpose. Water pollution is an important aspect of environmental pollution ground water is an important natural resource worldwide that exists only on our planet, without this precious resource life on earth would be non-existent. Good quality water is inadequate even for normal living and is getting contaminated due to domestic wastes, industrial wastes, agricultural wastes, runoff from urban areas and soluble effluents.1-3 Water quality parameters of ground water, river water and industrial effluents has been reported by several workers.5-6 The human body is very sensitive to fluoride in the diet. According to Indian Council of Medical Research (ICMR)7, it is essential for growth of bones and teeth, when it is upto 1 ppm. Nitrate occurs in trace quantities in surface waters but may attain high level in some ground water. Concern about elevated concentrations of nitrate in drinking water is growing especially in rural areas where runoff from nitrate rich fertilizers and animal manure often finds its way into the water supply. The ICMR (1975) has recommended highest desirable level of 500 mg/L and maximum permissible limit of 1500 mg/L for total dissolved solids8, which are in good agreement with the WHO international standards. Ground water is an important source of water supply throughout the world and it is the main source of drinking water in the most of the rural areas. The quality of ground water is continuously changing as a result of nature and human activities. During last decade, this is observed that ground water get polluted drastically because of increased human activities[2,3]. Polluted ground water is the cause for the spread of epidemics and chronic disease in human. Physico-chemical characteristics of ground water of different parts of countries have been studied by many authors[4-5]. Fluoride is natural component of the earth crust and also found in many mineral like fluorite, fluoroapetite etc[6-7]. The maximum permissible limit of fluoride in water is 1.5 mg/L by WHO and ICMR[8-9]. Effects of fluoride "Fluorosis" were first introduced by Schortt[10] and it is reported in both human and cattle[11-12]. Fluorosis is a most widespread geochemical disease affecting more than 66 million people including children under the age of 14 years[13]. Excess of fluoride causes dental, skeletal and non-skeletal fluorosis through continued use of fluoride contaminated water, air and agriculture products[14]. In Rajasthan state out of 27 districts; 16 districts, have been confirmed as fluoride affected area and have more than permissible limit concentration of fluoride[15-17]. The presence of fluoride in ground water can be attributed to geochemical reasons[18]. Nawalgarh is a small town in the Shekhawati region. In Shekhawati region of Rajasthan, the beautiful small town Nawalgarh

RESOURCE CONSTRAINTS IN ECONOMIC DEVELOPMENT OF INDIA

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Abstract

The Fact cannot be denied that India is considered as a prosperous and rich country as far as its ... and animal land area are concerned. But still the chief difficulty India is facing tod...

use it for their habitation. It is also the basis of most of the primary productive activities which are so essential for human existence. Land is not only required for agriculture, factories are also established on it. Vast tracts of land are used as grazing fields; forests grow on it and roads and railway lines are built on its surface. Obviously for most of these purposes, land with plain surface. Obviously for most of these purposes, land with plain surface containing fertile soil is required. Rocky lands, desert, ravines, etc., are good neither for agriculture nor for building transport system. Even for other activities they are not as suited as plains. Therefore, land endowments of a country do not depend merely on the size of its geographical area. The quality of land, particularly fertility of soil, is as much important as the size of the area. However, the level of progress will depend on its optimum utilisation.

Suggested Remedies

India has presently a higher proportion of area under cultivation to geographical area compared to most of the European countries and North America. Even in other countries such a high proportion of land has a not been put under cultivation. Keeping in view the requirements of the land for non-agricultural purpose and the need for restoring the disturbed ecological balance, it is not advisable to bring more area under cultivation. However, recourse to multiple cropping is both desirable and feasible. It is desirable, because it would result in optimal or near optimal utilisationof a resource, supply of which is already falling short of its demands. It is also feasible. Because with the known and usable sources of water supply, irrigation can be finally extended to 13.99 crore hectares. As against this, in 2010-11 about 63.9 per cent of the ultimate irrigation potential, that is, 8.94 core hectares was harnessed.

Soil Erosion

In India, required attention has not been paid to proper management of the land and soil resources with the result they have suffered serious degradation. In India, the land area for which records exist is 30.57 crore hectares, Out of this, as much as 17.5 crore hectares are subject to environmental problems. Water and wind erosion is causing damage to 15 crore hectares and this constitutes a major threat to the country's sustainable development.

Waterlogging and consequents salinity in irrigated areas have also caused considerable damage to our crore hectares of agricultural land. It has been estimated that about 0.6 crore hectares of agricultural land is affected by varying degrees of waterlogging and salinity. Apart from the canal ... obstructions to natural drainage

ScienceDirect

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Electronic structure properties of new equiatomic CoCuMnZ (Z=In, Sn, Sb) quaternary Heusler alloys: An ab-initio study

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Highlights

- Electronic Structure, elastic and magnetic properties of CoCuMnZ (For Z=In, Sn, Sb) have been investigated.
- Volume optimization results suggest that CoCuMnZ has $\delta 1$-type structure stability.
- CoCuMnSb is a true half metallic at the equilibrium lattice constant.
- Exchange coupling parameters establish CoCuMnZ to be ferromagnetic with large values of T_C.

Original Paper | Published: 11 June 2018

Electronic Structure, Elastic, Magnetic, and Optical Properties of Fe_2MnZ (Z = Si, Ge, and Sn) Full Heusler Alloys: First-Principle Calculations

Vivek Kumar Jain, N. Lakshmi ✉, Rakesh Jain & Aarti Rani Chandra

Journal of Superconductivity and Novel Magnetism **32**, 739–749 (2019)

Abstract

Investigations of the electronic structure, elastic, magnetic, and optical properties of Fe_2MnZ (Z = Si, Ge, and Sn) full Heusler alloys show mechanical stability with cubic symmetry in all three alloys. They are elastically anisotropic and Fe_2MnSi is ductile whereas Fe_2MnGe and Fe_2MnSn are brittle in nature. The value of total magnetic moment is 3 μ_B for Fe_2MnSi and Fe_2MnGe at their equilibrium lattice constants and follows the Slater–Pauling curve. Fe_2MnSn possess the largest magnetic moment among the three with a value of 5.73 μ_B at equilibrium lattice constant. Fe_2MnSi shows half-metallic nature with 100% spin polarization for a wide range of lattice parameters and is useful for spintronics devices. Good optical properties over

Original Paper | Published: 09 December 2017

Study of the Electronic Structure, Magnetic and Elastic Properties and Half-Metallic Stability on Variation of Lattice Constants for CoFeCrZ (Z = P, As, Sb) Heusler Alloys

Rakesh Jain, Vivek Kumar Jain, Aarti R. Chandra, Vishal Jain & N. Lakshmi

Journal of Superconductivity and Novel Magnetism
31, 2399–2409 (2018)

Abstract

Structural, elastic, magnetic and electronic properties of CoFeCrZ (Z = P, As, Sb) Heusler alloys in their YI-type structure have been computed by density functional theory-based WIEN2k code within generalized gradient approximation for exchange correlation functions. Values of formation energy and elastic constants verify the stability of these alloys. True half metallic ferromagnetic behaviour with 100% spin polarization and good band gap in the minority spin are obtained for all the alloys. Magnetic moment of these alloys is 4.00 μ_B, which matches well with the value predicted from Slater-Pauling rule. Half-metallicity is maintained over a wide range