

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Yearwise counting	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher	Website link
1	Panwar, D., Panesar, P. S., Singla, G., Krishania, M. and Thakur, A.	Recovery of nutrients and transformations of municipal/domestic wastewater for agricultural application	In book: Waste Valorisation: Waste Streams in a Circular Economy			International	1	2020	9781119502753	Sant Longowal Institute of Engineering & Technology	Wiley	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
2	Kaur, R., Panwar, D. and Panesar, P. S.	Enzyme mediated valorization of whey for value-added products	In book: Food Industry Wastes			International	2	2020	978-0-12-817121-9	Sant Longowal Institute of Engineering & Technology	Academic Press.	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
3	Kaur, R., and Panesar, P. S.	Enzyme systems for high-value biomolecule production.	In book: Biomass, Biofuels, Biochemicals			International	3	2020	978-0-12-819820-9	Sant Longowal Institute of Engineering & Technology	Elsevier	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
4	Seema Sharma, Romee Jan, Ramandeep Kaur, Charanjit S Riar	Antioxidants in Vegetables and Nuts- Properties and Health Benefits	Taro (Colocasia esculenta)			International	4	2020	978-981-15-7470-2	SLIET, Longowal	Springer, Singapore, Pages:341-353	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
5	Piyush Kashyap, Charanjit Singh Riar and Navdeep Jindal	Antioxidants in Fruits: Properties and Health Benefits	Sea Buckthorn			International	5	2020	978-981-15-7285-2_11	SLIET, Longowal	Springer, Singapore, Pages:341-353	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
6	Piyush Kashyap, Charanjit Singh Riar and Navdeep Jindal	Antioxidants in Fruits: Properties and Health Benefits	Sea Buckthorn			International	6	2020	978-981-15-7285-2_11	SLIET, Longowal	Springer, Singapore, Pages:341-353	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
7	Piyush Kashyap, Charanjit Singh Riar and Navdeep Jindal	Antioxidants in Fruits: Properties and Health Benefits	Sea Buckthorn			International	7	2020	978-981-15-7285-2_11	SLIET, Longowal	Springer, Singapore, Pages:341-353	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
8	Pradyuman Kumar	Antioxidants in Vegetables and Nuts- Properties and Health Benefits	Yam			International	8	2020	9.78981E+12	SLIET, Longowal	Springer Singapore	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
9	Pradyuman Kumar	Antioxidants in Fruits-Properties and Health Benefits	Pomegranate			International	9	2020	9.78981E+12	SLIET, Longowal	Springer Singapore	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
10	Bhardwaj M., Singh R., Kumar Y., & Saxena D.C.	Handbook of Fermented Food and Beverage	Role of fermentation on rheological properties and sensory attributes.			National	10	2020	115-135.	Sant Longowal Institute of Engineering & Technology	M/s Astral International Pvt Ltd, New Delhi.	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
11	Singh, A., Kaur, R., Kumar, P. and Singh, A. K.	Essential Fatty Acids: Sources, Processing Effects, and Health Benefits	Dietary fatty acids: A key requirement for healthy life in special reference with respect to processing			International	11	2020	ISBN: 9780367335403	SLIET	CRC Press/Apple Academic Press	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
12	Gull, A., Wani, S.M., Masoodi, F.A., Kumar, P. and Ganai, T.A	A Comprehensive Guide to Processed Foods	Essential fatty acids: A key requirement for healthy life in special reference with respect to processing			International	12	2020	978-1-53617-308-6	SLIET	Nova Science Publishers USA	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
13	Singh, A., Kaur, R. and Kumar, P.	Essential fatty acids: Sources, Processing Effects, and Health Benefits	Dietary fatty acids: A key requirement for healthy life in special reference with respect to processing			International	13	2020	(ISBN: 9780367335403).	SLIET	CRC Press/Apple Academic Press USA	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
14	Kumar, P., Verma, D.K., Kimmy, Srivastav, P.P. and Sandhu, K.S.	In: Phytochemicals in Food and Health: Perspectives for Research and Technological Development.	Tinospora cordifolia L.): Structure, Chemistry, and Health Benefits.			International	14	2020	(ISBN: 9781771889360).	SLIET	CRC Press/Apple Academic Press USA	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
15	R. Kaur and P.S. Panesar, (S.P. Singh, A.	Advances in Enzyme Catalysis and Technologies	"Enzyme systems for high-value biomolecule production"			International	15	2020	pp. 273-308.	SLIET	Elsevier Pub, USA,	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
16	Lochan Sharma, Sanjiv Kumar Paul, Himjyoti Dutta, Charanjit Singh Saini and Kawaljit Singh	Amylose: Properties, Structure and Functions,	Application of Amylose and Amylose-based Materials in Food, Medicine and Biologicals and Other Allied Fields			International	16	2020	Pp. 351-377.	SLIET	Nova Science Publishers Inc., New York,	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
17	Dr. P K Dhiman	Corporate social responsibility- an analysis of Environmental Issues...	NA	NA	NA	NA	17	2020	ASIN No. B08K4HRT51	SLIET	Disha International Publishing House	http://mh.sliet.ac.in/files/2023/02/Dr-Dhiman-10-Corporate-Social-Responsibility-an-analysis-of-Environmental-Issues.pdf
18	Rani, Ruchi and Kamlesh Prasad	Banana Starch: Isolation, Modification and Characterization	Banana Starch: Isolation, Modification and Characterization			International	1	2021	978-613-8-96087-4	Sant Longowal Institute of Engineering & Technology	Scholars' Press	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
19	Prasad, Kamlesh, Lovina and Shubhra Shekhar	Ready to Eat Egg Products: Heat Penetration Studies, Development and Characterization	Studies on the Selected Engineering Properties of Basmati Rice Flour			International	2	2021	978-613-8-96237-3	Sant Longowal Institute of Engineering & Technology	Scholars' Press	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
20	Misha, M. R. and Kamlesh Prasad	Studies on the Selected Engineering Properties of Basmati Rice Flour	Phytochemicals in Giloy (Tinospora cordifolia L.): Structure, Chemistry, and Health Benefits			International	3	2021	978-620-4-20439-0	Sant Longowal Institute of Engineering & Technology	Lambert Academic Publishing	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
21	Dr. Pradyuman Kumar	Phytochemicals in Giloy (Tinospora cordifolia L.): Structure, Chemistry, and Health Benefits	Enzyme production by submerged fermentation and their importance in food industry.			International	4	2021	9.78177E+12	SLIET Longowal	CRC Press, USA	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
22	Jagdish Singh, Parmjit S. Panesar, Harmanjot K. Sandhu and Gundeep Kaur	Enzyme production by submerged fermentation and their importance in food industry.	Nutraceuticals and Health Care			International	5	2021		Sant Longowal Institute of Engg. & Technology	New India Publishing Agency	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
23	Ramesh Kaur, Ramesh Chopra, Saba Bukhari, Renu Sharma, Rosy Bansal, Monika Hans, Dharmesh	Nutraceuticals and Health Care	Nutraceuticals-A deep and profound concept			International	6	2021	978-0-323-89779-2		Academic Press	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
24	Renuka Singh, Mamta Bhardwaj, D.C. Saxena	Advances in Cereals Processing Technologies	Rheological and Thermal Changes Occurring During Processing			International	7	2021	9781003261124		CRC Press	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
25	Singh R., Bhardwaj M., & Saxena D.C.	Rheological and thermal changes occurring during processing.	Cereals: Processing Technology.			National	8	2021	65-80.	Sant Longowal Institute of Engineering & Technology	New India Publishing Agency, New Delhi	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
26	Prof. Kamlesh Prasad	Effect of gamma radiation exposure on Physical Properties of Cicer Arietinum	Advanced Materials and Radiation Physics			International	9	2021			AIP, USA	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
27	Arya, P. and Kumar, P.	Fenugreek and COVID-19: A natural boost for human health	Synthesis of starch nanoparticles from pearl millet by acid hydrolysis coupled with ultrasonication and their subsequent application in biodegradable food packaging		Post Covid journey of Food Processing	International	10	2021		SLIET	AD Patel Institute of Technology, Anand	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
28	D.C. Saxena	Synthesis of starch nanoparticles from pearl millet by acid hydrolysis coupled with ultrasonication and their subsequent application in biodegradable food packaging	72 nd Starch Convention			International	11	2021		SLIET	Detmold Germany	http://fet.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf

29	Prof. Pardeep kumar Jain	Life Skills for a Skyrocketing Success	NA	NA	NA	NA	12	2021	979-8739648945	SLIET	White Falcon Publishing	http://mh.sliet.ac.in/files/2023/02/Dr-Jain-3-Life-Skills-for-a-Skyrocketing-.pdf	
30	Dr. JapPreet Kaur Bhangu	Essay on english literature Signposts and Landmarks	Lorraine Hansberry's A Raisin in the Sun: A Timely classic	NA	NA	NA	13	2021	978-81-290-0240-2	SLIET	New Era Publications	http://mh.sliet.ac.in/files/2023/02/Dr-JapPreet-12-Essay-on-english-literature-Signposts-and-Landmarks-.pdf	
31	Kaur, Ravneet, Shubhra Shekhar, Sahil Chaudhary, Barinderjit Singh and Kamlesh Prasad	Non- thermal Food Preservation Technologies				International	1	2022	https://www.intechopen.com/online-first/81233	Sant Longowal Institute of Engineering and Technology	Springer Nature	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
32	Kaur, Ravneet, Shubhra Shekhar and Kamlesh Prasad	Secondary Metabolites of Fruits and Vegetables with Antioxidant Potential				International	2	2022	978-981-19-1745-5	Sant Longowal Institute of Engineering and Technology	InTech Press, London	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
33	Kaur, Ravneet, Shubhra Shekhar and Kamlesh Prasad	Secondary Metabolites of Fruits and Vegetables with Antioxidant Potential				International	3	2022	978-981-19-1745-5	Sant Longowal Institute of Engineering and Technology	InTech Press, London	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
34	Dr. Pradyuman Kumar	Food processing innovations, traditional and modern foods & beverages, anti-oxidant attributes, chemistry, nutritional attributes, processing innovations, traditional and modern foods & beverages, anti-oxidant attributes,					4	2022	978-93-90591-63-3	SLIET Longowal	NIPA Delhi	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
35	Pranjal Chandra and P.S. Panesar	Nanosensing and Bioanalytical Technologies in Food Quality Control					5	2022	9789811670299	Sant Longowal Institute of Engg. & Technology	Springer Publications	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
36	Parmjit S. Panesar, Anil K. Anal	Probiotics, Prebiotics and Synbiotics: Technological Advancements Towards Safety and Industrial Applications					6	2022	9781119701200	Sant Longowal Institute of Engg. & Technology	John Wiley and Sons	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
37	Parmjit S. Panesar, A.K. Anal and Rupinder Kaur	Probiotics, Prebiotics and Synbiotics: Opportunities, Health Benefits and Industrial Challenges.					7	2022		Sant Longowal Institute of Engg. & Technology	Wiley Publications	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
38	D. Panwar, Parmjit S. Panesar and A. Saini	Prebiotics and their Role in Functional Food Product Development.					8	2022		Sant Longowal Institute of Engg. & Technology	Wiley Publications	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
39	Rupinder Kaur and Parmjit S. Panesar	Galactooligosaccharides as potential prebiotics.					9	2022		Sant Longowal Institute of Engg. & Technology	Wiley Publications	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
40	S. Kumari, Parmjit S. Panesar, D. Panwar, and G. Singla	Lactulose: Production and Potential Applications.					10	2022		Sant Longowal Institute of Engg. & Technology	Wiley Publications	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
41	A. Saini, D. Panwar, Parmjit S. Panesar, and P. Chandra	Potential of Nanotechnology in Food Analysis and Quality Improvement.					11	2022		Sant Longowal Institute of Engg. & Technology	Springer Publications	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
42	Tanuja Srivastava, D. C. Saxena & Renu Sharma	Cognitive Informatics and Soft Computing	Modeling and Optimization of Reaction Parameters for Glycerol Production Using Response Surface Methodology	Cognitive Informatics and Soft Computing	Proceeding of CISC 2021	National	12	2022	978-981-16-8763-1	Sant Longowal Institute of Engineering & Technology	Springer	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
43	Yogesh Kumar, Mamta Bhardwaj, AnkanKhetu, Dharmesh Saxena	Current Developments in Biotechnology and Bioengineering	Rheological analysis of food materials				13	2022	978-0-323-91158-0		Elsevier	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
44	Yogesh Kumar, Samandeep Kaur, Saptashish Deb, DC Saxena	Handbook of Fruit Wastes and By-Products	Banana Wastes: Chemistry, Processing, and Utilization				14	2022	9781003164463		CRC Press	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf	
45	Ashwani Kumar, Poonam Mishra	Biosensors	Piezoelectric effect based biosensor: Principle, Techniques and their Applications			International	15	2022	9.78043E+12		SLIET	CRC Press	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
46	Amir Gull, Gulzar Ahmad Nayik, Sajad Mohd Wani, Vikas Nanda	Handbook of Plum				International	16	2022	9.781E+12		SLIET	CRC	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
47	Parmjit S. Panesar, Anil K. Anal	Probiotics, Prebiotics and Synbiotics: Technological Advancements Towards Safety and Industrial Applications				International	17	2022	9.78112E+12		SLIET	John Wiley and Sons	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
48	Prof. Pardeep kumar Jain	Parenting Skills - A Practical Handbook for Every Parent		NA	NA	NA	18	2022	978-1636404714	SLIET	White Falcon Publishing	http://mh.sliet.ac.in/files/2023/02/Dr-Jain-4-Parenting-Skills-.pdf	
49	Nisar A. Mir, Charanjit S. Riari, Sukhcharn Singh,	Processing, Technologies, and Functionalities of Foods,	Cereals and Pseudo Cereals: General Introduction, Classification and Functionalities				19				SLIET	Apple Academic Press Publishing House, 2019,	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
50	Wani, S.A., and Kumar, P. 2019.	In Non thermal Processing of Food .	High Hydrostatic Pressure Processing of Cereals and Pulses .				20		(ISBN: 9781138035843)		SLIET	CRC Press. pp. 11-26.	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
51	Kumar, P., Mishra, S. and Mishra, H.N. 2018.	In Food Product and Process Innovations Ed Mishra, HN,	Mango soy fortified yoghurt powder and symbiotic yoghurt.				21		pp. 147-178. (ISBN: 9789386546944).		SLIET	New India Publishing Agency, New Delhi,	http://et.sliet.ac.in/files/2023/02/Chapter-Final_merged.pdf
52	Dr. Dilip Kumar	Constrained QoS Routing Protocol for		World Congress on Engineering	Engineering and Computer Science	International	1	2017	978-988-14047-5-6	SLIET	IEEE	https://www.ieaeng.org/publication/WCECS2017/WCECS2017_pp106-111.pdf	
53	Dr. Gurjinder Kaur	Detection and prevention of blackhole attacks in wireless sensor networks		Springer	Springer	International	2	2017	978-3-319-69155-8	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-3-319-69155-8_8	
54	Dr. Surinder Singh	Biometric crystal near sensor based on sensing ring for different blood		2017 19th International Conference on Ubiquitous Computing	International	International	3	2017	978-1-5090-4749-9	SLIET	IEEE	https://ieeexplore.ieee.org/document/7993816	
55	Dr. Surinder Singh	Determination of iron sulfide on agriculture farming using microwave		2017 19th International Conference on Ubiquitous Computing	International	International	4	2017	978-1-5090-4749-9	SLIET	IEEE	https://ieeexplore.ieee.org/document/7993820	
56	Dr. Surinder Singh	Disruption cancellation for sensors carrying high speed information in		2017 19th International Conference on Ubiquitous Computing	International	International	5	2017	978-1-5386-0860-9	SLIET	IEEE	https://ieeexplore.ieee.org/document/8024967	
57	Dr. Surinder Singh	Wavelength Convertible Optical Switch based on Cross Gain Modulation Effect of SOA		Latest Advances in Machine Learning and Data Science (IAADMS'2020)		International	6	2017	978-981-10-8569-7	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-10-8569-7_36	
58	Manpreet Singh Manna	Higher Education Faculty Career Orientation and Advancement				National	10	2017	978-81-933475-9-1	SLIET	CEGR, New Delhi		
59	Nikhil Prakash	On the Rice Husk Ash Mixing with Cement: Preparation, Characterization		Proceedings of Annual meeting of AICHE-2017	2017 AICHE Annual Meeting	International	11	2017	ISBN: 978-0-8169-1102-8	SLIET, LONGOWAL		https://aiche.confex.com/aiche/2017/meetingapp.cgi/Paper/495770	
60	Nikhil Prakash	Antimicrobial Polymers: Present State of the Art.		Proceedings of Annual meeting of AICHE-2017	2017 AICHE Annual Meeting	International	12	2017	ISBN: 978-0-8169-1102-8	SLIET, LONGOWAL	Minneapolis, MN, USA	https://aiche.confex.com/aiche/2017/meetingapp.cgi/Paper/501747	
61	Nikhil Prakash	Artificial Neural Network for Ethylene/Norbornene Copolymerization Catalyzed By 2-		Proceedings of Annual meeting of AICHE-2017	2017 AICHE Annual Meeting	International	13	2017	ISBN: 978-0-8169-1102-8	SLIET, LONGOWAL	Minneapolis, MN, USA	https://aiche.confex.com/aiche/2017/meetingapp.cgi/Paper/490294	
62	Nikhil Prakash	Constrained Geometry Single Site Catalysts for Olefin Polymerization.		Proceedings of Annual meeting of AICHE-2017	2017 AICHE Annual Meeting	International	14	2017	ISBN: 978-0-8169-1102-8	SLIET, LONGOWAL	Minneapolis, MN, USA		

63	S S Ghumman	IAEA Scientific and Technical Report	Structural damage evolution in CAZP12 O 7 zirconolite on 30 keV Helium ion irradiation effects in nuclear waste	N.A	N.A	N.A	16	2017	978-92-0-136922	SLIET Longowal	IAEA TECDOC	
64	S.M. Ahuja		Removal of Cadmium (II) from Aqueous Solutions by using Chitosan-Modified Adsorbent	International	International	International	17	2017	SLIET, LONGOWAL	SLIET, LONGOWAL	SLIET, LONGOWAL	http://www.ijarse.com/images/fullpdf/1511157179_173_IJARSE.pdf
65	Vinod Mishra	Theory of Transforms with Applications				National	21	2017	978-9-38-546260-3	SLIET	Ane Books, New Delhi	https://www.amazon.in/theory-of-transforms-applications-vinod-mishra/dp/9789385462603
66	A. S. Shahi and Sandeep S Sandhu		Pitting Behavior of Thermally Aged Inconel 625 Weld Claddings Made Using SMAW and GMAW Process			International	1	2018	978-3-319-89480-5	Sant Longowal Institute of Engineering and Technology	The Minerals, Metals & Materials Series book series	https://www.springer.com/n/pitting-behavior-of-thermally-aged-inconel-625-weld-claddings-9783319894805
67	A.S.K. Sinha		Fibers In Manufacturing of Decorative Laminates To Avoid Burning In	CCECP 2018		International	2	2018		SLIET, LONGOWAL		
68	Dhiraj Sud	Storage synthesis of transition metal oxides-based electrode material for				INTERNATIONAL	4	2018		SLIET	9781945291630-10	https://www.mrforum.com/product/9781945291531-7/
69	Dhiraj Sud & Nidhi Sharotri	TiO2 based nanocomposite for photocatalytic degradation of organic pollutants				INTERNATIONAL	5	2018		SLIET	9781945291630-10	https://www.mrforum.com/product/9781945291630-10/
70	Dr. A.S. Arora and Dr. Jaspreet Singh	Advances in Machine Learning and Data Science	Contrast Enhancement Algorithm for IR Thermograms Using Optimal Temperature Thresholding and	Advances in Machine Learning and Data Science	Advances in Machine Learning and Data Science	International	7	2018	978-981-10-8569-7	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-10-8569-7_37
71	Dr. Dilip Kumar		Adaptive TDMA Based QoS-Aware MAC protocol for Hierarchical Wireless Sensor Networks	Proceedings of the 1st International Workshop on Computer Science and		International	8	2018	978-981-11-7861-0	SLIET		http://www.wcse.org/WCSE_2018/WO40.pdf
72	Dr. Gurjinder Kaur		Prevention of Flooding Attacks in Mobile Ad Hoc Networks	International Conference on Distributed Environment for	International Conference on Wireless Intelligent	International	9	2018	978-3-030-11437-4	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-3-030-11437-4_15
73	Dr. Gurjinder Kaur		Load balanced clustering protocol for enhancing the lifetime of wireless			International	10	2018	ISSN (Print): 2394-5443	SLIET		https://www.accentjournals.org/PaperDirectory/Journal/UATEE/2018/9/3.pdf
74	Dr. P K Dhiman	Education transforming into Higher Education Pros & Cons:Challenges- PB.	NA	NA	NA	NA	12	2018	978-81-937643-1-2	SLIET	SLM Publishers Patiala	
75	Dr. Surinder Singh		Efficiency Estimation of All Optical Contention Detection in Optical Router For 60 Gbps	International Conference on Microwave and Photonics (ICMAP-2018)			14	2018	978-1-5386-0933-0	SLIET	IEEE	https://ieeexplore.ieee.org/document/8354591
76	Dr. Surinder Singh		Development of Conformal Dipole Antenna For Biotelemetry Applications	International Conference (ISER),			15	2018		SLIET		http://www.rajajournal.com/journal_merjournal_pdf/11-501-154450818873-76-146
77	Gurwinder Singh, Birmohan Singh & Manpreet Kaur	Lecture Notes in Electrical Engineering	Analysis of electroencephalogram for the recognition of epileptogenic area using Ensemble Empirical Mode decomposition	Springer	Springer		17	2018	978-981-13-2685-1	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-13-2685-1_46
78	H.R. Ghatak	Reaction Engineering Principles					18	2018	9.7815E+12	SLIET, LONGOWAL	CRC Press, Taylor and Francis Publication	
79	Harish Kumar Sharma and Parmjit S. Panesar,	Technologies in Food Processing				International	21	2018	9.78177E+12	SLIET	CRC	
80	Manpreet Kaur & Birmohan Singh	Lecture Notes in Networks and Systems	Diagnosis of Malignant Pleural Mesothelioma Using KNN	Springer	Springer		25	2018	978-981-13-1217-5	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-13-1217-5_62
81												
82	Nishtha Rawat, Manminder Singh & Birmohan Singh	Lecture Notes in Networks and Systems book series	A Hybrid Approach for Speckle Reduction in Ultrasound	Springer	Springer		27	2018	978-981-13-2323-2	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-13-2324-9_26
83	Prof. Damanpreet Singh		Mutual Reputation Based Service Mapping in Cloud Environment	Seventh International Conference on Advances in Computing Electronics and	Seventh International Conference on Advances in	International	29	2018	978-1-63248-157-3	SLIET	Conference on Advances in Computing Electronics and	https://www.seekdl.org/conferences/paper/details/9524
84	Prof. Damanpreet Singh		Power and Resource-Aware VM Placement in Cloud Environment	2018 IEEE 8th International Advance Computing	2018 IEEE 8th International Advance	International	30	2018	978-1-5386-6678-4	SLIET	2018 IEEE 8th International Advance	https://ieeexplore.ieee.org/document/8692118
85	Prof. Damanpreet Singh		Concentric Layered Architecture for Multi-Level Clustering in Large-Scale Wireless Sensor Networks	2018 First International Conference on Secure Cyber Computing and	2018 First International Conference on Secure	International	31	2018	978-1-5386-6373-8	SLIET	2018 First International Conference on Secure Cyber Computing and	https://ieeexplore.ieee.org/document/8703282
86	S S Ghumman	IAEA Scientific and Technical Report	Lattice changes on low energy ion irradiation: 30 keV He + ion	N.A	N.A	N.A	35	2018	978-92-0-136922	SLIET Longowal	IAEA TECDOC	
87	Sandeep S Sandhu and A. S. Shahi		Fracture Toughness and Fatigue Behaviour of Variably Precipitated Inconel 625/AISI 304L Welds	9th International Symposium on Superalloy 718 &	9th International Symposium on Superalloy 718 &	International	36	2018	978-3-319-89480-5	Sant Longowal Institute of Engineering and Technology	The Minerals, Metals & Materials Series book series	https://link.springer.com/chapter/10.1007/978-3-319-89480-5_58
88	Sunil Kumar, Rastogi Vikas and Pardeep Gupta	A hybrid control scheme for modeling and control of 1-DOF flexible arm URM for welding applications	A hybrid control scheme for modeling and control of 1-DOF flexible arm URM for welding applications	Conference on Bond Graph Modeling (ICBGM 2018) Bordeaux, France 2018 Summer Simulation Multi-Conference (SummerSim'18) Simulation Series Volume 50 Number 12 Bond Graph Modeling (ICBGM 2018) Bordeaux, France	13th International Conference on Bond Graph Modeling (ICBGM 2018)	International	37	2018	978-1-5108-6025-4	Sant Longowal Institute of Engineering and Technology, Longowal	The society for modeling and simulation international	https://www.researchgate.net/publication/330703271_A_hybrid_control_scheme_for_modeling_and_control_of_1-DOF_flexible_arm_URM_for_welding_applications
89	VK Kukreja	AIP Conference Proceedings	Computational analysis of some partial differential equations using efficient	AIP Conference Proceedings	International Conference On	International	38	2018	978-0-7354-4177-4	SLIET	AIP	https://aip.scitation.org/doi/pdf/10.1063/1.50084393

90	Jatinder Pal Singh		Comparative Study of LEACH and its Optimized Variants in Wireless Sensor Networks	In Proceedings of 2nd International Conference on Innovation in Computing, held at CGC College of Engineering, Mohali, 12	In Proceedings of 2nd International Conference on Innovation in Computing, held at CGC College of Engineering, Mohali, 12	International	42	2018		SLIET	In Proceedings of 2nd International Conference on Innovation in Computing, held at CGC College of Engineering, Mohali, 12	
91	Pushpa Jha	Re-Use and Recycling of Materials	Application of Agro-Residues-Based Activated Carbon as Adsorbents for Phenol Sequestration from Aqueous Streams: A Review	-	-	International	1	2019	978-87-7022-058-3 (Hardback) 978-87-7022-057-6 (Ebook)	SLIET, LONGOWAL	Rivers Publishers, Denmark and the Netherlands	https://www.taylorfrancis.com/chapter/edit/10.1201/9781003339304-13/application-agro-residues-based-activated-carbon-adsorbents-phenol-sequestration-aqueous-streams-review
92	Upender Dhull & Pardeep Gupta	Performance and Emission testing of Diesel Engine using blends of Biodiesel from Castor Oil and Neem Oil prepared using Lithium Doped Graphene	Performance and Emission testing of Diesel Engine using blends of Biodiesel from Castor Oil and Neem Oil prepared using Lithium Doped Graphene	Springer Proceeding Lecture Notes in Mechanical Engineering	4th International conference on "Emerging Trends in Mechanical and	International	4	2019	2195-4364	Sanj Longowal Institute of Engineering and Technology,	Springer	https://link.springer.com/chapter/10.1007/978-981-15-8304-9_19
93	Anshul Agarwal, Arvind Jayant, Vaibhav Gupta	Artificial Intelligence in Industrial Engineering Lecture Notes in Mechanical Engineering book series	Application of Machine Learning Technique for demand forecasting: A Case Study of manufacturing industry			International	5	2019	2195-4356	Sanj Longowal Institute of Engineering and	Springer	https://link.springer.com/chapter/10.1007/978-981-15-5519-0_31
94	Arvind Jayant	Industrial Engineering & Operation Management: Application of Decision-Making Techniques					6	2019	13-978-93-85046-45	Sanj Longowal Institute of Engineering and	Springer	https://www.researchgate.net/profile/Arvind-Jayant
95	Arvind Jayant, Janpriy Sharma	Operations Management and Systems Engineering	Optimization of Product Flow in a Multi-products Manufacturing Unit: A			International	7	2019	ISBN978-981-13-6476-1.	Sanj Longowal Institute of Engineering and	Springer	https://link.springer.com/chapter/10.1007/978-981-13-6476-1_11
96	Arvind Jayant, Neeru	Patnaik S. (eds) New Paradigm of Industry 4.0. Studies in Big Data, vol 64. Springer, Cham	Decision Support framework for smart implementation of green supply chain practices in the book titled "Studies in			International	8	2019	978-3-030-25777-4	Sanj Longowal Institute of Engineering and	Springer	https://link.springer.com/chapter/10.1007/978-3-030-25778-1_4
97	Dr. J. S. Ubhi	Comparative Analysis of Standard 9T SRAM with the Proposed Low-Power 9T SRAM. Lecture Notes in Electrical Engineering, vol 526. Springer,	New Paradigm of Industry 4.0 (pp.49-98)			International	10	2019		SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-13-2553-3_52
98	Dr. J. S. Ubhi	Advances in signal processing and Communication. Lecture Notes in Electrical Engineering, vol 526.	Leakage Reduction in Full Adder Circuit Using Source Biasing at 45 nm Technology			International	11	2019		SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-13-2553-3_29
99	Dr. J. S. Ubhi	Real Time Object Tracking: Simulation and Implementation on FPGA based Soft Processor					12	2019		SLIET	Springer	https://eudl.eu/doi/10.1007/978-3-642-37949-9_38
100	Dr. J.S. Dhillon	Power System Engineering, 3rd Edition				International	13	2019	978-93-5316-511-6	SLIET	McGraw Hill Education (India) Private Ltd.	https://www.waterstones.com/book/power-system-optimization/d-p-kothari/j-s-dhillon/9788120340855
101	Dr. Manpreet Kaur	Recent Trends in Communication, Computing, and Electronics	Analysis of electroencephalogram for the recognition of epileptogenic area using Ensemble Empirical Mode	Recent Trends in Communication, Computing, and Electronics	2nd International Conference on Communication	International	14	2019	978-981-13-2684-4	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-13-2685-1_46
102	Dr. Manpreet Kaur		Diagnosis of Malignant Pleural Mesothelioma Using KNN	2nd International Conference on Communication	2nd International Conference on Communication	International	15	2019	978-981-13-1216-8	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-13-1217-5_62
103	Dr. Surinder Singh		Design approach of all optical contention detection circuit	International conference			16	2019	11082-019-1922-9	SLIET	Springer	https://link.springer.com/article/10.1007/s11082-019-1922-9
104	Dr. Surinder Singh		Miniature Arc-immune Spiral FRX Antennas for Biomedical Implantable	2019 1st international Conference on Signal			17	2019		SLIET	IEEE	https://ieeexplore.ieee.org/document/8711600
105	Dr. Surinder Singh		SAR Analysis of Antenna implanted Inside Homogeneous Human Tissue	2019 1st international Conference on Signal			18	2019	978-1-7281-1381-4	SLIET	IEEE	https://ieeexplore.ieee.org/document/8711783
106	Dr. Surinder Singh		Detection analysis of UWB microstrip antenna for breast cancer	1st international conference on sustainable			19	2019	978-981-15-0029-9	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-15-0029-9_17
107	Dr. Surinder Singh		Surface plasmon resonance sensor based on photonic crystal fiber covered with gold film	6th academic conference on natural science for young scientist, mastel and phd students from ASEAN			20	2019		SLIET	Springer	https://www.researchgate.net/publication/343040025_Surface_Plasmon_resonance_sensor_based_on_photonic_crystal_fiber_covered_with_gold_film
108	Dr. Surinder Singh		Parametric Analysis of Implantable Spiral PIFA Antenna for Biotelemetry	International Conference (SLIETCON-2019)			21	2019		SLIET		
109	Jatinder Pal Singh		Unequal clustering algorithms in Wireless Sensor Networks: A Survey	In Proceedings of 3rd International Conference on Innovation in Computing, held at CGC College of Engineering, Mohali, 12	In Proceedings of 3rd International Conference on Innovation in Computing, held at CGC College of Engineering, Mohali, 12	International	22	2019	International	SLIET	In Proceedings of 3rd International Conference on Innovation in Computing, held at CGC College of Engineering, Mohali, 12	https://www.mimik.com/opus/article/163501318aams_vol_196_april_2020_a6_p495-507_jatinder_pal_singh_and_anil_k_ve
110	Jatinder Pal Singh, Anuj K. Gupta, Anil K. Verma	Journal of Communication Engineering & Systems	Comparative Study of LEACH and its Optimized Variants in Wireless Sensor	stmjournals		International	23	2019	2321-5151	SLIET	stmjournals	
111	Jitendra Upadhyay, Anuj Bansal, Jagtar Singh	Effect on Mechanical and Metallurgical Properties of Cryogenically Treated Material SS316	Effect on Mechanical and Metallurgical Properties of Cryogenically Treated Material SS316	Manufacturing Engineering. Lecture Notes on Multidisciplinary	4th International Conference on Production & Industrial Engineering	International	24	2019	978-981-13-6287-3	Sanj Longowal Institute of Engineering and Technology,	Springer	https://www.springerprofessional.de/en/effect-on-mechanical-and-metallurgical-properties-of-14688724
112	Nikhil Prakash		Sorption rate sensitivity analysis of Catalytic Gas-phase Propene		RICET-2019	National	25	2019		SLIET, LONGOWAL	National	
113	Nikhil Prakash		Optimized Kinetic Parameters of Metallocene Catalyzed Olefin Polymerization through Modelling and Simulation.	Proceedings of Annual meeting of AIChE-2019	2019 AIChE Annual Meeting	International	26	2019	978-0-8169	SLIET, LONGOWAL	International	https://www.aiche.org/conferences/aiche-annual-meeting/2019/proceeding/paper/560de-optimized-kinetic-parameters-metallocene-catalyzed-olefin-polymerization-through-modelling-and

114	Nikhil Prakash		Propylene Polymerization Process Modelling and Simulation.	Proceedings of Annual meeting of AIChE-2019	2019 AIChE Annual Meeting	International	27	2019	978-0-8169	SLIET, LONGOWAL	Orlando, FL, USA.	https://www.aiche.org/conferences/aiche-annual-meeting/2019/proceeding/paper/373ae-propylene-polymerization-process-modelling-and-simulation
115	Nikhil Prakash		Analysis and Review of Micro and Nano-Structured Polymeric Materials.	Proceedings of Annual meeting of AIChE-2019	2019 AIChE Annual Meeting	International	28	2019	978-0-8169	SLIET, LONGOWAL	Orlando, FL, USA.	https://www.aiche.org/conferences/aiche-annual-meeting/2019/proceeding/paper/181ba-analysis-and-review-micro-and-nano-structured-polymeric-materials
116	Nikhil Prakash & Amit Rai		Synthesis and Processing of Polymers with Supercritical Fluids.	Proceedings of Annual meeting of AIChE-2019	2019 AIChE Annual Meeting	International	29	2019	978-0-8169	SLIET, LONGOWAL	Orlando, FL, USA.	https://www.aiche.org/conferences/aiche-annual-meeting/2019/proceeding/session/materials-synthesis-and-processing-compressed-or-supercritical-fluids
117	Pushpa Jha	Application of agro-residues-based activated carbon as adsorbents for phenol sequestration from aqueous streams: A review	Book	Book			31	2019	978-87-7022-058-3 (Hardback) 978-87-7022-057-6 (E-book)	SLIET, LONGOWAL	Rivers, Denmark and the Netherlands	https://www.taylorfrancis.com/chapters/edit/10.1201/9781003339304-13/application-agro-residues-based-activated-carbon-adsorbents-phenol-sequestration-aqueous-streams-review
118	Shweta Singh, Arvind Jayant, Tanmay Walke	Advances in Production and Industrial Engineering. Lecture Notes in Mechanical Engineering	A robust hybrid multi-criteria decision-making approach for selection of third-party reverse logistics service provider			International	32	2019	978-981-15-5519-0	Sanj Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-15-5519-0_32
119	Vivek Gupta, Arvind Jayant	Lecture Notes in Mechanical Engineering (Springer Publication)	Management: A Fuzzy-DEMATEL Analysis of Some Practical Issues of	Recent Advances in Mechanical Engineering		International	34	2019	2195-4356.	Sanj Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-15-8704-7_4
120	A. Bansal, J. Singla, S. Pandey, P. Raj.	Design and Development of High-Velocity Submerged Water Jet Cavitation Erosion Test Rig		Lecture Notes on Multidisciplinary Industrial Engineering	5th International Conference on Production & Manufacturing Engineering	International	3	2020	978-981-15-4619-8	Sanj Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-15-4619-8_7
121	A. Saxena, R. K. Saxena	Thermomechanical Analysis of Al-7075 to Predict Residual Stresses by Using 3D Finite Element Simulation	Thermo-mechanical analysis of Al-7075 to predict residual stresses by using 3-D FEM simulation	Advances in Mechanical Engineering	Conference on Recent Innovations and	International	4	2020	978-981-15-0123-4	Sanj Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-15-0124-1_26
122	A. Singh, A. Bansal, J. Singh, A. K. Singla	Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410	Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410	Advances in Mechanical Engineering. Lecture Notes on Multidisciplinary Industrial Engineering	Conference on Production & Manufacturing Engineering	International	5	2020	978-981-15-4619-8	Sanj Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-15-4619-8_17
123	Dhiraj Sud and Priti Bansal	Polymeric -TiO2 Nanocomposites for Development of Fouling Resistant Membranes for Wastewater Treatment in Handbook of Nanomaterials and Nanocomposites for Energy and Environmental Applications, Kharissova et al. (eds.),	Springer Nature Switzerland AG 2020 O. V.	Handbook of Nanomaterials and Nanocomposites for Energy and Environmental Application	Handbook of Nanomaterials and Nanocomposites for Energy and Environmental Application	INTERNATIONAL	9	2020	978-3-030-36267-6	SLIET	Dimensions	https://app.dimensions.ai/details/publication/pub.1139609643?and_facet_researcher=ur.01177246363.25
124	Dhiraj Sud, Paramjeet Kaur and Priti Bansal	Heterogeneous Photocatalytic Treatment of Synthetic Dyes Emanating in Aqueous System from Unmanned Aerial Vehicle.	Scholars-press			NATIONAL	10	2020	978-953-51-2543-3	SLIET		
125	Dr. A.S. Arora and Dr. Jaspreet Singh	Applications in Agriculture and	The role of infrared thermal imaging in Road Patrolling Using Unmanned Aerial Vehicle.	Applications in Agriculture	Unmanned Aerial Vehicle: Applications	International	11	2020	978-3-030-27156-5	SLIET	Springer	
126	Dr. Anupma marwaha	7th International Conference on Signal Processing and Integrated Networks (SPIN)	Reduction of specific absorption rate (SAR) for human head using circular patch antenna. In 2020 7th International Conference on Signal Processing and Integrated Networks (SPIN)	7th International Conference on Signal Processing and Integrated Networks (SPIN)	7th International Conference on Signal Processing and Integrated Networks (SPIN)	International	12	2020	2688-769X	SLIET	IEEE	https://ieeexplore.ieee.org/document/9071274
127	Dr. Surinder Singh		Optical and wireless Nonlinear Polarization Rotation in Hybrid Memristor	Optical and wireless Technologies: Proceedings of COMET 2020			16	2020	978-981-16-2817-7	SLIET	Springer Nature	https://link.springer.com/chapter/10.1007/978-981-16-2818-4_23
128	G. Singh, R. K. Saxena, S. Pandey	Finite Element Based Prediction of Transient Temperature Distribution, Heat Affected Zone and Residual Stresses in AISI 304 Stainless Steel	Transient Temperature Distribution, Heat Affected Zone and Residual Stresses in AISI 304 Stainless Steel	Advances in Mechanical Engineering	Conference on Recent Innovations and Developments in Mechanical Engineering	International	17	2020	978-981-15-0123-4	Sanj Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-15-0124-1_28
129	Jastej Singh & A. S. Shahi	Weldability aspects of electron beam welded duplex stainless steel' Nova Science	Weldability aspects of electron beam welded duplex stainless steel' Nova Science			International	19	2020	978-1-53618-342-9	Sanj Longowal Institute of Engineering and Technology	Nova Science Publishers, New York, USA	https://www.researchgate.net/publication/348152234_Weldability_Aspects_of_Electron_Beam_Welded_Duplex_Steel
130	Jatinder Pal Singh	Unequal clustering algorithms in Wireless Sensor Networks: A Survey	Unequal clustering algorithms in Wireless Sensor Networks: A Survey	In Proceedings of 3rd International Conference on Innovation in computing, held at CGC College of Engineering, Mohali-12	In Proceedings of 3rd International Conference on Innovation in Computing	International	20	2020	International	SLIET	International Conference on Innovation in computing, held at CGC College of Engineering, Mohali-12	https://www.mmmmk.com/uploader/article/163501318aams_vol_196_april_2020_a6_p495-507_jatinder_pal_singh_and_anil_k_verma
131	JATINDER PAL SINGH, ANUJ K. GUPTA and ANIL K. VERMA	Advances and Applications in Mathematical Sciences	Unequal clustering algorithms in Wireless Sensor Networks: A Survey	Mili Publications	Mili Publications	International	21	2020	2321-5151	SLIET	Mili Publications	https://www.mmmmk.com/uploader/article/163501318aams_vol_196_april_2020_a6_p495-507_jatinder_pal_singh_and_anil_k_verma
132	JR Sharma	AIP Conference Proceedings	to study of complex dynamics of some iterative techniques for computing	AIP Conference Proceedings	3rd International Conference on	International	22	2020	978-0735441774	SLIET	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0083557
133	Kanika Aggarwal	N.A	Hydrogen sensing properties of Palladium thin films and nanoparticles	AIP conference proceedings	3rd International conference on	International	23	2020	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0001717?journalCode=apc
134	Panwar, D., Panesar, P. S., Singla, G., Krishania, M. and Thakur, A.	recovery of nutrients and transformations of municipal/domestic	In book: Waste Valorisation: Waste Streams in a Circular Economy			International	27	2020	9781119502753	Sanj Longowal Institute of	Wiley	https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119502753.ch6
135	Prof. Damanpreet Singh		A Comprehensive study for Energy Conservation in Wireless Sensor	DSIC sponsored National Conference on Biomedical Engineering	DSIC sponsored National Conference on Biomedical Engineering	International	33	2020	978-81-948668-9-3	SLIET	DSIC sponsored National Conference on Biomedical Engineering	http://proceeding.conferenceworld.in/NCEB_2020/Proceeding.pdf
136	Prof. Damanpreet Singh		Smart healthcare using Wireless Sensor Networks: A review	DSIC sponsored National Conference on Biomedical Engineering	DSIC sponsored National Conference on Biomedical Engineering	International	34	2020	978-81-948668-9-3	SLIET	DSIC sponsored National Conference on Biomedical Engineering	http://proceeding.conferenceworld.in/NCEB_2020/Proceeding.pdf

137	Prof. Damanpreet Singh		Performance Evaluation of Clustering Techniques in Wireless Sensor Networks	IEEE INFO - Taiwan 2nd International Conference on Computing, Analytics and Network Security	IEEE INFO - Taiwan 2nd International Conference on Computing, Analytics and Network Security	International	35	2020	978-1-7281-4999-8	SLIET	International Conference on Computing, Analytics and Network Security	https://ieeexplore.ieee.org/document/9181360
138												
139	Pushpa Jha	-	Application of Crop-residue biomass as a Catalyst for Production from West-Castles Oil	International Conference on Advances in Chemical Engineering-2020	International Conference on Advances in Chemical Engineering-2020	International	37	2020	https://ssrn.com/abstract=3705099	SLIET, LONGOWAL	Elsevier	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3705099
140	R Foujdar, MB Bera, HK Chopra	Biopolymer-Based Formulations/Phenolic nanoconjugates and its application in food	Phenolic nanoconjugates and its application in food						978-0-12-816897-4	SLIET	Elsevier	https://www.sciencedirect.com/book/9780128168974/biopolymer-based-formulations#book-description
141						International						
142	Shahi, A.S., Malhotra, D.	Effect of Dual Phase Stabilization via Varying Ti/Nb Ratios on the Pitting Behavior of AISI 347 Welds	Effect of Dual Phase Stabilization via Varying Ti/Nb Ratios on the Pitting Behavior of AISI 347 Welds			International	40	2020	978-3-030-36627-8 978-3-030-36628-5	Sant Longowal Institute of Engineering and Technology	International Conference of Minerals, Metals, and Materials 2020. The	https://link.springer.com/chapter/10.1007/978-3-030-36628-5_23
143	Singh A., Bansal A., Singh J., and Singla A.K.	Manufacturing Engineering. Lecture Notes on Multidisciplinary Industrial Engineering. Springer, Singapore	TREATMENT ON MECHANICAL AND METALLURGICAL PROPERTIES OF 6061-T6 ALUMINUM			International	41	2020	2522-5030	Sant Longowal Institute of Engineering and Technology	Springer	https://www.springer.com/series/15734
144	Amandeep Singh, Kamlesh Kumari, Patit Paban Kundu	Nanocellulose Biocomposites for Bone Tissue Engineering: Handbook of Nanocelluloses.	Nanocellulose Biocomposites for Bone Tissue Engineering: Handbook of Nanocelluloses.			International	1	2021	978-3-030-62976-2_391	SLIET, LONGOWAL	Springer, Singapore	https://link.springer.com/referenceworkentry/10.1007/978-3-030-89621-8_39
145	Amandeep Singh, Kamlesh Kumari, Patit Paban Kundu	Polyurethane Nanocomposites for Bone Tissue Engineering In book: Engineered Nanomaterials for Innovative Therapies and Biomedicine.	Polyurethane Nanocomposites for Bone Tissue Engineering			International	2	2021	373-403	SLIET, LONGOWAL	Springer Nature	https://link.springer.com/chapter/10.1007/978-3-030-82918-6_15
146	Amar Nath, Rajdeep Niyogi	Robotics Software Design and Engineering	Autonomous Cooperative Transportation	IntechOpen	IntechOpen	International	3	2021	9781839692918	SLIET	IntechOpen	https://www.intechopen.com/chapters/77658
147	Anand Parey, Rajesh Kumar, Manpreet Singh	Recent Trends in Engineering Design Select Proceedings of ICAST 2020: Select Proceedings of ICAST 2020				International	4	2021	978-981-16-1078-3	Sant Longowal Institute of Engineering and Technology, Longowal	Springer	https://link.springer.com/book/10.1007/978-981-16-1079-0
148	Anand Parey, Rajesh Kumar, Manpreet Singh	Recent Trends in Engineering Design Select Proceedings of ICAST 2020: Select Proceedings of ICAST 2020	Recent Trends in Engineering Design Select Proceedings of ICAST 2020: Select Proceedings of ICAST 2020	Recent Trends in Engineering Design	ICAST International Conference on Advances in Science and Technology	International	5	2021	978-981-16-1078-3	Sant Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/book/10.1007/978-981-16-1079-0
149	AS Dhaliwal	Book edited, Springer Series on Polymer and Composite Materials-Electrospun Nanofibers: Fabrication, Functionalization and Applications	"Surface Engineering of Nanofiber Membranes via Electrospinning embedded Nanoparticles for Wastewater Treatment"	N.A	N.A	N.A	7	2021	978-3-030-79978-6, 978-3-030-79979-3	SLIET Longowal	Springer	Book-chapter-1.pdf (sliet.ac.in)
150	AS Dhaliwal	N.A	Structural and surface morphological studies of WSe2 2-D material	AIP Conference Proceedings	International e-Conference on Nanotechnology	National	8	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052724
151	AS Dhaliwal	N.A	Fabrication and characterization of TiO2 based dye-sensitized solar cell	AIP Conference Proceedings	International e-Conference on Advanced Materials and Radiation Physics (AMRP-2020)	National	9	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052483?journalCode=apc#.text=The%20dye%2Dsensitized%20solar%20cell,found%20to%20be%2088.45%20n
152	AS Dhaliwal	N.A	Effects of target thickness on the shape of the bremsstrahlung energy spectrum of Pb in the photon energy region of 1-100 keV	AIP Conference Proceedings	5th National e-Conference on Advanced Materials and Radiation Physics (AMRP-2020)	National	10	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/10.1063/5.0052341
153	AS Dhaliwal	N.A	Synthesis and Rietveld refinement study of calcium doped zirconia	AIP Conference Proceedings	5th National e-Conference on Advanced Materials and Radiation Physics (AMRP-2020)	National	11	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052559
154	AS Dhaliwal	N.A	Structural studies of zirconia and yttria doped zirconia for analysing its phase transition	ICP Conference series: Materials Science and Engineering	International Conference on Nanotechnology	International	12	2021	1757-899X and 1757-8981	SLIET Longowal	IOP	https://iopscience.iop.org/article/10.1088/1757-899X/1033/1/012052
155	AS Dhaliwal, KS Kahlon	N.A	Investigation of gamma ray and fast neutron shielding ability of some waste glasses for nuclear waste storage	AIP Conference Proceedings	International e-Conference on Advanced Materials and Radiation Physics (AMRP-2020)	National	13	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052727
156	Avtar Singh, Virrajjeet Kaur, Anupama Parmar and Harish	Handbook of Greener Synthesis of Nanomaterials and Compounds/	The Fundamental Perspectives of Greener Synthesis			International	14	2021	978-0-12-821938-6	SLIET	Elsevier	https://www.sciencedirect.com/science/article/pii/B9780128219386000013
157	Deepti Rani, Anju Sangwan, Anupma Sangwan, Tajinder Singh	Energy-Efficient Underwater Wireless Communications and Networking	Machine Learning Techniques for Underwater Wireless Sensor Networks: A Comprehensive Study	IGI Global	IGI Global	International	16	2021	9781799836407	UIST Oakrate	IGI Global	https://www.igi-global.com/chapter/machine-learning-techniques-for-underwater-wireless-communications-and-networking/
158	Dr J.S. Ubhi	" Chapter in book on Modelling & optimization of Signals using Machine Learning Techniques	Current Advancements of Steganography in Spatial Domain				17	2021		SLIET	Scrivener Publishing-Wiley	https://easychair.org/publications/preprint_open/t5Cr
159	Dr. A.S. Arora	AI and Deep Learning in Biometric Security	AI-Based Approach for Person Identification Using ECG Biometric			International	18	2021	978-1003003489	SLIET	CRC Press	https://www.caymanpublishing.com/capapers/edit/10.1201/9781003003489-6/ai-based-approach-person-identification-using-ecg-biometric-amit-kaul-arora
160	Dr. Ajaypal Singh	The role of the infrared thermal imaging in road patrolling using unmanned aerial vehicles	Unmanned Aerial Vehicle: Applications in Agriculture and Environment			International	19	2021		SLIET	Springer	https://link.springer.com/chapter/10.1007/978-3-030-27157-2_11

182	MM Sinha	N.A	Phonon dispersion and density of States of Fe ₂ SiO ₄ in spinel phase	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	46	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052582
183	MM Sinha	N.A	Theoretical investigation of electronic and vibrational properties of ZnO	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	47	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052491
184	MM Sinha	N.A	ADFT based computation of structural, elastic and mechanical properties of ZnO	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	48	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052345
185	MM Sinha	N.A	Structural and electronic properties of high potential Ca ₃ PbO: An Ab Initio Study	Materials Science and Engineering Series	Conference on International	International	49	2021	1757-899X and 1757-8981	SLIET Longowal	IOP	https://iopscience.iop.org/article/10.1088/1757-899X/1033/1/012080
186	MM Sinha, SS Verma	N.A	Thermoelectric properties of Weyl semi-metal ZrTe	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	50	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/10.1063/5.0052526
187	Nitin Yadav & Rajesh Kumar	Harvesting Electric Energy from Waste Vibrations of an Electric Motor Using the Piezoelectric Principle	Harvesting Electric Energy from Waste Vibrations of an Electric Motor Using the Piezoelectric Principle	Recent Advances in Manufacturing, Automation, Design and Energy	Conference on future technologies in	International	51	2021	ISSN 2195-4364	Sant Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-16-4222-7_104
188	P Kaur, KS Mann	N.A	moisture-dependent dielectric properties of soils of Faridkot region	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	52	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/10.1063/5.0052715
189	Pardeep Gupta and Sumit Kumar	Productivity improvements in an Indian Automotive OEM Using Heijunka, A Lean Manufacturing Approach: A Case Study	Productivity improvements in an Indian Automotive OEM Using Heijunka, A Lean Manufacturing Approach: A Case Study	Lecture Notes on Multidisciplinary Industrial Engineering	International conference on Production & Operations Management	International	53	2021	ISBN 978-981-15-6016-3 ISBN 978-981-15-6017-0 (eBook)	Sant Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-15-6017-0_10
190	Prof. Damanpreet Singh	-	Design of efficient ternary Organic Solar Cell Using P3HT:CZTS:PCBM Blends for WSN	International Trends in Electronics	Conference on Innovative Trends in Electronics	International	55	2021	978-9-3911-3175-3	SLIET	International Conference on Innovative Trends in Electronics	https://icitee-2021.ecedpu.ac.in/
191	Pushpa Jha	-	Comparison of biomasses as adsorbent materials for phenol removal	WIT Transactions on Engineering Sciences	Conference on	International	58	2021	1044-5803	SLIET, LONGOWAL	WIT Press	https://www.witpress.com/Secure/elibrary/papers/MC21/MC21014FU1.pdf
192	Pushpa Jha	-	Comparison of biomasses as adsorbent materials for phenol removal.	-	-	-	59	2021	Volume: 133, pp. 127-133	SLIET, LONGOWAL	WIT Transactions on Engineering Sciences	https://www.witpress.com/elibrary/wit-transactions-on-engineering-sciences/133/38041
193	S S Ghumman	N.A	Waste Loading Capability of Zirconolite: A Review	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	62	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052493
194	S S Ghumman	N.A	Magnetolectric multiferroic, Y-Type Hexaferrites : A Review	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	63	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052452
195	SS Verma	N.A	Plasmonic response of liquid metal nanoparticles with gold coatings	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	65	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/10.1063/5.0052989
196	SS Verma	N.A	Quaternary resistor composite LiYNiSn: A search of new	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	66	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052372
197	SS Verma, MM Sinha	N.A	Theoretical calculation of adsorption properties of NiFe@ Au core-shell	AIP Conference Proceedings	Advanced Materials and Radiation Physics	National	67	2021	1551-7616	SLIET Longowal	AIP	https://aip.scitation.org/doi/10.1063/5.0052377
198	Sunil Kumar, Vikas Rastogi, Prabhkiran Kaur	Active vibration control of two flexible links underwater manipulator	Active vibration control of two flexible links underwater manipulator	2021 INTERNATIONAL CONFERENCE ON BOND GRAPH MODELING AND SIMULATION, (BGM 2021)	INTERNATIONAL CONFERENCE ON BOND GRAPH MODELING AND SIMULATION, (BGM 2021)	International	68	2021	978-1-7138-3946-0	Sant Longowal Institute of Engineering and Technology, Longowal	The society for modeling and simulation international	https://scs.org/wp-content/uploads/2015/10/Active-Vibration-Control-of-Two-Flexible-Link-Underwater-Manipulator.pdf
199	Tajinder Singh, Madhu Kumari	Computational Modeling and Data Analysis in COVID-19 Research	Machine Learning-Based Text Mining in Social Media for COVID-19.	CRC Press	CRC Press		69	2021	9781003137481	IIM	CRC Press	https://www.taylorfrancis.com/chapters/edit/10.1201/9781003137481-6/machine-learning-based-text-mining-social-media-covid-19-tajinder-singh-madhu-kumari
200	Vinod Mishra	Springer Proceedings in Mathematics and Statistics	Application of magic Squares in Cryptography	Springer Proceedings in Adaptive, Learning and Computing	International Conference on	International	70	2021	2363-6092	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-3-030-97196-0_26
201	Vinod Mishra	AIP Conference Proceedings	Moment of Inertia of Generalized Magic Cubes	AIP Conference Proceedings	Conference on	National	71	2021	1551-7616	SLIET	AIP	https://aip.scitation.org/doi/abs/10.1063/5.0052389
202	Vinod Mishra	AIP Conference Proceedings	On the Circulant matrices with Lucas Sequences and Gaussian Fibonacci	AIP Conference Proceedings	Conference on	National	72	2021	1551-7616	SLIET	AIP	https://aip.scitation.org/doi/10.1063/5.0052565
203	Ahmad, K., Ghatak H.R., and Ahuja, S.M.	A review on the valorization of Biorefinery Based Waste Lignin: Exploratory Potential Market Approach.		on Chemical, Bio and Environmental Engineering			2	2022	ISBN 978-3-030-96553-2, ISBN 978-3-030-96554-9 (eBook)	SLIET, LONGOWAL	Springer; Berlin, Germany	https://link.springer.com/chapter/10.1007/978-3-030-96554-9_19
204	Amandeep Singh, Sovan Lal Banerjee, Kamlesh Kumari, Patit Paban Kundu	Recent innovations in Chemical Recycling of Polyethylene Terephthalate Waste: A Circular Economy Approach toward Sustainability; Handbook of solid Waste Management					3	2022	978-981-16-4230-2-53	SLIET, LONGOWAL	Springer, Singapore	https://link.springer.com/referenceworkentry/10.1007/978-981-16-4230-2_53
205	Arshpreet Kaur, Harshita, Gagandeep Kaur, and *Dhiraj Sud	Graphene Oxide and its Nanocomposite for Wastewater Treatment	Nanomaterials in Manufacturing processes			INTERNATIONAL	6	2022	9.781E+12	SLIET	CRC Press	https://www.taylorfrancis.com/chapters/edit/10.1201/9781003154884-12/graphene-oxide-nanocomposite-wastewater-treatment-arshpreet-kaur-harshita-bagwal-gagandeep-kaur-dhiraj-sud
206	AS Dhaliwal	Book entitled "Conjugated Polymers for Next Generation of Photovoltaics, Energy Storage and Electronics – Volume 1 in Woodhead Publishing Series in Electronic and Optical Materials"	"Conductive Polymer-based Composite Photocatalysts for Environment and Energy Applications".	N.A	N.A	N.A	7	2022	22147853	SLIET Longowal	Woodhead Publishing Series	https://www.sciencedirect.com/science/article/pii/B9780128234426000118
207	AS Dhaliwal	N.A	Cyclic voltammetry synthesis of polyaniline as supercapacitors	Materials Today: Proceedings	International Symposium on	International	8	2022	2214-7853	SLIET Longowal	Elsevier	https://www.sciencedirect.com/science/article/pii/S2214785320303047
208	AS Dhaliwal	N.A	Synthesis and characterization of Graphene Oxide and its reduction with	Materials Science and Engineering Series	Conference on	International	9	2022	1757-899X and 1757-8981	SLIET Longowal	IOP	https://iopscience.iop.org/article/10.1088/1757-899X/1225/1/012050/meta
209	Avtar Singh, Nirmaljeet Kaur, Anupama Parmar, Harish Kumar Chopra	Ionic Liquids in Analytical Chemistry/Structure and properties of Ionic liquids: Green aspects				International	11	2022	9.78013E+12	SLIET	Elsevier	https://www.sciencedirect.com/science/article/pii/B978012823344000047?via%3DIihub

210	D. Panwar, Parmjit S. Panesar and A. Saini	Prebiotics and their Role in Functional Food Product Development.					12	2022		Sam Longowal Institute of Engg.	Wiley Publications	https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119702160.ch11
211	Dhiraj Sud	Nanomaterials in Manufacturing Processes-	Book			International	13	2022	9.78037E+12	SLIET	CRC Press	https://www.routledge.com/Nanomaterials-in-Manufacturing-Processes/Sud-Singla-Gupta/p/book/9780367724580#
212	Dr. Dilip Kumar	IoT or IoT in smart precision Agriculture					14	2022		SLIET	Springer	
213	Dr. Gurjinder Kaur	Cyber-Physical Systems	Security Issues and Challenges for Cyber-Physical Systems	Taylor and Francis	Taylor and Francis	International	15	2022	978-1-003-20275-2	SLIET	Taylor and Francis	https://oa.mg/work/10.1201/9781003202752-9
214	Dr. Major Singh	Lecture Notes in Networks and Systems	E-FFTF: An extended framework for flexible fault tolerance in cloud	IoT and Analytics for Sensor Networks	IoT and Analytics for Sensor Networks	International	16	2022	978-981-16-2919-8	SLIET	IoT and Analytics for Sensor Networks	https://www.springerprofessional.de/n/e-fft-an-extended-framework-for-flexible-fault-tolerance-in-14466444
215	Dr. Surinder Singh		Designing of a novel PCB Biosensor having Octagonal Core and based on SPR for Chemical and Heavy Metal	2022 12th International Conference on Cloud Computing, Data Science & Applications			18	2022		SLIET	IEEE	https://ieeexplore.ieee.org/abstract/document/9734120
216	Giri, N., Brar, G.S., Shahi, A. S.	Correction to: Investigation of Mechanical Properties in Friction Stir Welded Mg AZ 31 Alloy Workpieces	Correction to: Investigation of Mechanical Properties in Friction Stir Welded Mg AZ 31 Alloy Workpieces			International	19	2022	978-3-030-99569-0 978-3-030-99568-3	Sam Longowal Institute of Engineering and Technology	In Additive, Subtractive, and Hybrid Technologies, Springer	https://link.springer.com/chapter/10.1007/978-3-030-99569-0_14
217	Hemant Kumar, Amandeep Kaur, Amit Rai	Copper (II) Schiff Base Metal Complex for Environmental Remediation" in the conference CHEMBIOEN book "Advances in Chemical, Bio and Environmental Engineering.					20	2022		SLIET, LONGOWAL	Springer	https://link.springer.com/chapter/10.1007/978-3-030-96554-9_69
218	Isha Jain, Payal Malik	Polymeric Biomaterials and Bioengineering, Part of the Lecture Notes in Bioengineering book series	Copper(II)-catalyzed ring opening polymerization of cyclic esters	APA Bioforum proceeding Polymeric Biomaterials and Bioengineering	APA Bioforum International e-Conference on Biomaterials and Bioengineering	International	21	2022	978-981-19-1084-5	SLIET	Springer	https://www.springerprofessional.de/copper-ii-catalyzed-ring-opening-polymerization-of-cyclic-14466444
219	Kaleem Ahmad, Amit Rai, Dinesh Chand	Groundwater quality Assessment by Using water quality Index for Block Abohar, District Fazilka in Punjab" in the conference CHEMBIOEN book "Advances in Chemical, Bio and Environmental Engineering".					22	2022		SLIET, LONGOWAL	Springer	https://link.springer.com/chapter/10.1007/978-3-030-96554-9_72#:~:text=The%20water%20quality%20index%20were,be%20protected%20from%20dangerous%20bacteria.
220	Kumar, S. and Kumar, R.	Classification of worm gearbox fault using Dendrogram Support Vector Machine	Classification of worm gearbox fault using Dendrogram Support Vector Machine	Recent Advances in Machines and Mechanisms	International Conference on Machines and Mechanisms	International	26	2022	978-981-19-3715-6	Sam Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-19-3716-3_21
221	Madhvi and Dhiraj Sud	Investigations on excellent selectivity and performance for removal of anionic dyes from wastewater using terephthalaldehyde crosslinked chitosan copolymerized with acrylamide	Lecture notes Bioengineering			INTERNATIONAL	27	2022	ISBN978-981-19-1083-8	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-19-1084-5_10
222	Manminder Singh		Internet of Things: Challenges and Research Opportunities	Apple Academic Press	Apple Academic Press	International	28	2022	9.781E+12	SLIET	Apple Academic Press	https://www.taylorfrancis.com/chapters/edit/10.1201/9781003131229-24/internet-things-challenges-research-opportunities-mandeep-kaur
223	Moin Hasan, Major Singh Goraya & Tanya Garg	IoT and Analytics for Sensor Networks	E-FFTF: An extended framework for flexible fault tolerance in cloud	Springer	Springer	International	29	2022	978-981-16-2918-1	SLIET	Springer	https://www.springerprofessional.de/n/e-fft-an-extended-framework-for-flexible-fault-tolerance-in-14466444
224	Nirmajee Kaur, Avtar Singh, Pawanpreet Kaur, Harish Kumar	Ionic Liquids in Analytical Chemistry/Ionic Liquids in Chiral Chemistry				International	30	2022	9.78013E+12	SLIET	Elsevier	https://www.sciencedirect.com/science/article/pii/B9780128233344000072
225	P Malik, A Singh, A Parmar, HK Chopra	Aqueous Mediated Heterogeneous Catalysis/ Water-mediated heterogeneous catalysis for organic functional group transformations and synthesis				International	31	2022	3110733846	SLIET	Walter de Gruyter GmbH & Co KG	https://books.google.co.in/books?hl=en&lr=&id=9pwEAAQBAJ&oi=fnd&pg=PA201&dq=info:4tsvTylc_G8J:scholar.google.com&ots=m5pHSUVais&sig=K6cn_FPOKMWZnXSHBmunGGRwWBE&redir_esc=y#v=onepage&q&f=false
226	Payal Malik	Water-mediated heterogeneous catalysis for organic functional group transformations and synthesis in Asit K. Chakraborti, Bubun Banerjee (Eds), Aqueous Mediated Heterogeneous Catalysis,				International	35	2022	9.78311E+12	SLIET	De Gruyter	https://books.google.co.in/books?hl=en&lr=&id=9pwEAAQBAJ&oi=fnd&pg=PA201&dq=info:4tsvTylc_G8J:scholar.google.com&ots=m5pHSUVbgt&sig=Gxmqmqrwmw_1b_geK3xCtMMQmM&redir_esc=y#v=onepage&q&f=false
227	Dhiraj Sud	Nanomaterials in Manufacturing Processes-	Nanomaterials in Manufacturing Processes-			International	38	2022	9.78037E+12	SLIET	CRC Press	https://www.routledge.com/Nanomaterials-in-Manufacturing-Processes/Sud-Singla-Gupta/p/book/9780367724580
228												
229												
230	S.M. Ahuja		A review on the valorization of Biorefinery Based Waste Lignin: Environmental Perspective		International Conference on Chemical Research	International	41	2022	2010-4618	SLIET, LONGOWAL	978-3-030-96553-2	https://link.springer.com/chapter/10.1007/978-3-030-96554-9_19
231	S.M. Ahuja		Recent ameliorations in membrane based carbon capture technologies.	Materials Today		International	42	2022	1369-7021	SLIET, LONGOWAL	Elsevier	https://www.sciencedirect.com/science/article/pii/S2214785322024750

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233	SS VERMA	Handbook of Oxidative Stress in Cancer: Therapeutic Aspects	Plasmonic Photothermal Therapy (PPTT) of Cancer	N.A	N.A	N.A	44	2022	978-981-16-1247-3	SLIET Longowal	Springer	https://link.springer.com/reference-work/10.1007/978-981-16-1247-3
234	SS Verma	N.A	Microanalytical Pre-processing Methodologies using Machine Learning in Text Mining: A Social Network Analysis of Pre-processing	Materials Today: Proceedings	International Symposium on Materials of the 21st Century	International	45	2022	22147853	SLIET Longowal	Elsevier	https://www.sciencedirect.com/science/article/pii/S221478532200997X
235	Tajinder Singh, Madhu Kumari, Daya Sagar Gupta, Nikolai Siniak	Convergence of Cloud with AI for Big Data Analytics: Foundations and Innovation	Machine Learning in Text Mining: A Social Network Analysis of Pre-processing	Springer	Springer	Springer	46	2022	9781119904885	SLIET	Springer	https://scriverpublishing.com/cart/title.php?id=717
236												
237	Vashishtha, G. and Kumar, R.	Feature Selection Based on Gaussian Ant Lion Optimizer for Fault Identification in Centrifugal Pump	Feature Selection Based on Gaussian Ant Lion Optimizer for Fault Identification in Centrifugal Pump	Recent Advances in Machines and Mechanisms	International Conference on Machines and Mechanisms	International	48	2022	978-981-19-3715-6	Sant Longowal Institute of Engineering and Technology	Springer	https://link.springer.com/chapter/10.1007/978-981-19-3716-3_23
238	Vinod Mishra	Understanding ethics and Values in Shrinking World	Magic Squares in Indian Mathematics: Constructions and Properties	Understanding ethics and Values in Shrinking World	International Conference on Understanding ethics and Values in Shrinking World	National	49	2022	978-93-54358-94-4	SLIET	Bloomsbury Publishing, UK	https://www.researchgate.net/publication/361277570_Magic_Squares_in_Indian_Mathematics_Constructions_and_Properties_in_Understanding_Values_and_Ethics_in_Shrinking_World_Bloomsbury
239	Vinod Mishra	History and Development of Mathematics in India	Fibonacci Sequence: History and Modern Applications	History and Development of Mathematics in India	Conference on History and Development of Mathematics in India	National	50	2022	978-93-80829-70-8	SLIET	National Mission for Manuscript and DK Print World, New Delhi	https://www.researchgate.net/publication/359541696_Fibonacci_Sequence_History_and_Modern_Applications_in_History_and_Development_of_Mathematics_in_India_National_Mission_for_Manuscripts_and_DK_Printworld_New_Delhi
240	Kuldip Singh	Eigen Space and ANN Based Approach to Synthesize 12-Lead ECG		Advances in VLSI, Communication, and Signal Processing			53		978-981-19-2630-3	SLIET	Springer	https://link.springer.com/chapter/10.1007/978-981-19-2631-0_52
241	Saurabh Puri, Anupama Parmar and Harish Kumar Chopra	Handbook of Greener Synthesis of Nanomaterials and Compounds/Ultrasound Assisted Reactions					56		978-0-12-821938-6	SLIET	Elsevier	https://www.sciencedirect.com/book/9780128219386/handbook-of-greener-synthesis-of-nanomaterials-and-compounds
242	Shah, T.R., Prasad, K and Kumar, P.		Functional, antioxidant activity and pasting properties of maize flat bread supplemented with asparagus		Recent Trends in agriculture, food science, forestry,	International	1	2017		SLIET	March 25, JNU, Delhi.	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
243	Haq, R., Kumar, P. and Prasad, K.		Effect of ozonation techniques on carotenoid degradation and moisture diffusivity of pretreated and untreated		National Conference on Advances in Food Science and Technology	National	2	2017		SLIET	24-25 March, Eternal University, Baru Sahib	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
244	Poonam, Kumar, P. and Hathan, B. S.		Development of ready to eat instant sand pear candy using response surface methodology		National Conference on Advances in Food Science and Technology	National	3	2017		SLIET	24-25 March, Eternal University, Baru Sahib	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
245	Kimmy, Verma, D.K., Kumar, P. and Srivastav, P.P.		Study on proximate composition and elemental analysis of giloy (Tinospora cordifolia L.) stem.		National Conference on Advances in Food Science and Technology	National	4	2017		SLIET	24-25 March, Eternal University, Baru Sahib	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
246	Vikas Nanda and Savita Sharma	Novel Food Processing and Technologies				National	5	2017	9.78939E+11	SLIET	New Indian Publisher Agency (NIPA)	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
247	Siddiqui, Mohammed Wasim, Bansal, Vasudha; Prasad,	Plant Secondary Metabolites: Stimulation, Extraction, and Utilization				International	6	2017	978-1-315 36631-9	SLIET	Apple Academic Press, CRC Press and Taylor and Francis	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
248	M.R. Kosseva, V.K. Joshi, Parmjit S. Panesar	Science and Technology of Fruit Wine Production				International	7	2017	9.78013E+12	SLIET	Academic Press	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
249	Prof. Kamlesh Prasad		Development and Physico-chemical Characterization of Cold Pressed	ISER International Conference London, UK			1	2018				http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
250	Prof. Kamlesh Prasad		Storage changes in chocolate coated roasted flaked and puffed rice	Advancements in Engineering & Technology			2	2018			ICAET-2018	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
251	Wani, S.A., Parry, M.A. and Kumar, P.	Technologies in Food Processing Eds. Sharma, HK and Panesar, PS	Changes in physical, nutritional and nutritional characteristics of extrudates			International	3	2018	9.78177E+12	SLIET	Apple Academic Press	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
252	Kumar, P., Mishra, S. and Mishra, H.N.	Food Product and Process Innovations Ed Mishra, HN	Mango soy fortified yoghurt powder and symbiotic yoghurt.			National	4	2018	9.78939E+12	SLIET	New India Publishing Agency, New Delhi	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
253	Kushwaha, S. C., Bera, M. B. and Kumar, P.		Functional and physico-chemical characterization of ellagitannin from		Engineering and Natural Science National Conference on Emerging and Sustainable	International	5	2018		SLIET	1-2 August 2018, Kuala Lumpur, Malaysia	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
254	Wani, S.A. and Kumar, P.		Functional, antioxidant and structural characteristics of snacks as affected by		National Conference on Emerging and Sustainable	National	6	2018		SLIET	15-16 March, SLIET, Longowal	http://fet.sliet.ac.in/files/2023/02/Chapters-Final_merged.pdf
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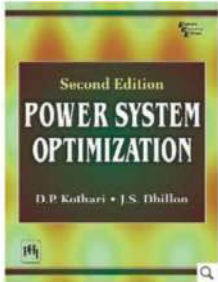
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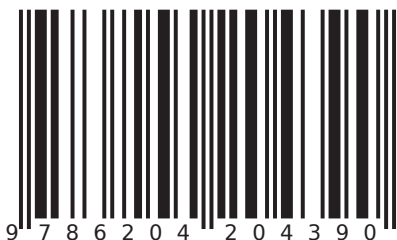
The physical properties, which include dimensional, gravimetric, and frictional properties of broken and head rice kernels of variety PUSA 1121 were studied. Dry, semidry, and wet grinding methods were employed to grind the broken, and the chemical analysis was done for all three types of flours. Adsorption isotherm was studied at 20, 30, and 40°C. Pasting and powder rheology was studied at various moisture levels. Thermal properties (thermal conductivity, thermal diffusivity, and specific heat) of flours were studied as a function of moisture content. Various prediction models were used to compare the value of thermal conductivity obtained through the experimental method. The specific heat was also compared with the values obtained from the prediction model and the error found was mere minimum.



Misha M R
Kamlesh Prasad

The corresponding author is Professor and Head, Department, Food Engineering & Technology, Sant Longowal Institute of Engineering & Technology, Longowal. His specialization is in Fruits and vegetable processing.

Studies on the Selected Engineering Properties of Basmati Rice Flour



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Banana Starch

Banana starch was isolated, purified, and characterized from plantain and dessert green banana cultivars. The Grand Naine banana is commonly used as a ripened banana for table purposes in India. Banana has to be transported in green unripe form from its cultivation center to various destinations in India mainly through a surface transport system. The banana has to face harsh conditions during surface transportation, loading, and unloading. The associated quantitative losses were observed to be around 30%. The edible portion recovered from those bananas was around 35%. Out of the edible portion, starch could be extracted to about 11% using the wet extraction method. Considering the above problem of huge losses occurred for dessert banana the modification of Grand Naine banana starch was carried out through two different physical procedures such as pre-gelatinization and heat moisture treatment. Further, the modified starches were characterized based on physical, chemical, thermal, functional, rheological, and morphological properties.

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Ruchi Rani
Kamlesh Prasad

Banana Starch

Isolation, Modification and Characterization

Ready to Eat Egg Products

India is the fifth largest producer of eggs in the world with a production figure of 30 billion eggs per annum. At present, just four states, Andhra Pradesh, Tamil Nādu, Punjab, and Maharashtra account for more than 50% of the total output of eggs in the country. Considering the net protein utilization and protein efficiency ratio, the egg is considered the best source of protein apart from the other nutrient source. Thermal processing has a significant effect on the sensory, thermal, textural, nutritional, and microbial quality of processed products. Analog thermal kinetic study during heat treatment at various temperatures (75, 80, 85, 90, and 95°C) revealed that heat transfer rate is faster at higher temperatures. The thermal treatment combination of 92.77°C/12min resulted in optimum coagulated egg product with sensory OAA score ranging from 8.23 to 8.64 on the nine-point hedonic scale. Further studies for the development of ready to eat product was carried out using blending with yolk and spice mix at optimum temperature and time combination.

Dr. Kamlesh Prasad is Professor and Head of Department, Food Engineering & Technology, Sant Longowal Institute of Engineering & Technology, Longowal. He is involved in the development of Ready to Eat specialized food products.



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Ready to Eat Egg Products

Heat Penetration Studies, Development and Optimization

Chapter 6 1

Non-thermal Food Preservation 2

Technologies 3

Ravneet Kaur, Shubhra Shekhar, Sahil Chaudhary, Barinderjit Singh, 4
and Kamlesh Prasad 5

Abstract Recent food processing trends and preservation technology mainly focus 6
on retaining freshness and minimizing nutritional and sensory losses during 7
processing. Conventional processing techniques involve high temperature (thermal 8
processing) for microbial inactivation and food preservation. Exposure to high- 9
temperature results in the loss of heat-sensitive nutritional components and affects 10
textural and sensory characteristics of foods. Therefore, to obtain high-quality 11
minimally processed food products, non-thermal techniques are found to be better. 12
Standard non-thermal preservation techniques include high-pressure processing, 13
pulsed electric field, cold plasma, supercritical carbon dioxide, irradiation, and 14
ultrasound. This chapter focuses mainly on the principles, processing, and applica- 15
tion of non-thermal techniques in food preservation. 16

Keywords Non-thermal food preservation · High-pressure processing · Pulsed 17
electric field · Cold plasma · Supercritical carbon dioxide · Irradiation · Ultrasound 18

6.1 Introduction 19

Food preservation, safety, and quality are the significant goals of food processing 20 AU1
industries to meet consumer demand as per the recent trends. Commonly used 21
traditional food processing techniques involve thermal treatment for improving the 22
production rates and shelf-life extension. Thermal processing is required to get the 23
desired characteristics in processed food products but involves higher temperature 24

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Chapter

Secondary Metabolites of Fruits and Vegetables with Antioxidant Potential

Ravneet Kaur, Shubhra Shekhar and Kamlesh Prasad

Abstract

An antioxidant is of great interest among researchers, scientists, nutritionists, and the public because of its ability to prevent oxidative damage, as indicated by various studies. This chapter mainly focuses on the free radicals and their types; antioxidants and their mode of action against free radicals; fruits, vegetables, and their byproducts as a source of antioxidants; and various analytical methods employed for assessing antioxidant activity. Antioxidants discussed in this chapter are ascorbic acid, Vitamin E, carotenoids and polyphenols, and their mechanism of action. Different antioxidant activity assay techniques have been reported. Fruits and vegetables are abundant sources of these secondary metabolites. The waste generated during processing has many bioactive materials, which possibly be used in value-added by-products.

Keywords: antioxidant, free radical, oxidative stress, secondary metabolite, ascorbic acid, carotenoids, polyphenol, degenerative diseases

1. Introduction

The word antioxidant is commonly heard nowadays, especially whenever there comes a topic of health concern. People consume antioxidants as a symbol of a healthy lifestyle to fight against various health problems, better skin, and anti-aging benefits. What makes antioxidants so important? The trait responsible for such importance of antioxidants is their ability to stop free radical reactions that can have potentially deleterious effects [1]. This gives rise to various questions, such as What are the free radicals? What are the sources of free radicals? What are their harmful effects? What are antioxidants? What are the common sources of antioxidants? How do they work against free radicals? Answers to these questions are discussed in the present chapter.

2. Free radicals

Free radicals are those atoms or molecules with an unpaired electron in their outer orbit [2]. Any electron present alone in an orbital is referred to as an unpaired electron, and it is accountable for the reactive and unstable state of the free radical.

CHAPTER 10

PREDICTIVE MODELING FOR PACKAGED FRUITS AND VEGETABLES

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CONTENTS

Abstract.....	228
10.1 Introduction.....	228
10.2 Fruits and Vegetables.....	229
10.3 Maturation and Ripening.....	230
10.4 Packaging of Fruits and Vegetables.....	231
10.5 Quality and Shelf-Life of Packaged Fruits and Vegetables.....	232
10.6 Conclusion.....	253
Keywords.....	253
References.....	254

Rheological analysis of food materials

Yogesh Kumar^{a,*}, Mamta Bhardwaj^a, Ankan Kheto^b
and Dharmesh Saxena^a

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2.1 Introduction

A combination of carbohydrates, proteins, fats, water, and fibers is known as a food that shows complex morphological and structural properties. The structural and flow behavior of different food materials are not identical due to the non-uniform combination of these constituents. Rheological properties give us an idea about the behavior of viscoelastic fluid under varying shear force, deformation rate, concentration, temperature, and time. It is closely associated with the sensory and quality characteristics of food material. Earlier, in food materials, rheological analysis was mainly concentrated on steady-state flow behavior where the structural breakdown was the main drawback in the case of food. To overcome this problem, oscillatory and creep tests were introduced for proper characterization without altering the structural properties. With the technological advancement in instrumentation, the rotational rheometer and oscillatory rheometer can determine the required parameters under varying or constant stress/strain in a more accurate manner. Moreover, these rheometers are capable of determining nonlinear flow behavior under high shear stress or shear strain to analyze the viscosity, elasticity of complex fluids and indirectly provide the sensory and textural property of the material.

The rheological characteristics of any product depend on the source, morphological property, concentration, presence of different polymer compounds, pasting conditions, and storage conditions. For example, the rheological properties of liquid food materials are influenced

Nutraceutical-A deep and profound concept

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1.1 Introduction

Consumer awareness regarding role of nutraceuticals is the important key factor which generates demand for nutraceutical sector. Consumers have wistful longing for specialty nutrition which leads to digestive health, beauty enhancement, specific chronic health problems, and so on. The major bone problems prevailing in society like osteoporosis and arthritis have also propelled the nutritionists to work in this direction. The protein progression has also led to design specialty nutraceuticals for children. Nutraceuticals working as pharma foods help in inhibition of cardiopathy, high blood pressure, osteoporosis, high blood glucose, and for lowering saturated fatty acids (Salmeron et al., 1997).

This demand has revolutionized the food world to be offering a notable benefaction to good health as well as well-being of human beings. Nutraceutical acting as preventive foods also helps in improving the gastric and stomach problems as they work as probiotics and prebiotics as well. Overall nutraceuticals improve the immune system thus helping in fighting with harmful extraneous microorganisms. Many lifestyle-related diseases like cancer can be treated with the sensible intake of nutraceuticals. Although nutraceuticals are not the magic bullets which are directly targeting the cancer cells but they can prevent the further infections and inflammations and in turn will boost the immune system (Kessler et al., 2001). Wrong food intake habits can lead to colon cancer because of the conversion of precarcinogens to carcinogens by intestinal microflora. The enzymes like glycosides, azoreductases, and nitroreductases present in intestinal microflora convert these precarcinogens to carcinogens. The use of probiotic strains like *Lactobacillus acidophilus* and *Lactobacillus casei* helps to reduce the levels of these enzymes and so the generation of these enzymes will be reduced by imparting them anticancer effects. Many of the natural foods like fish, tomato, and green leafy vegetables have bioactive compounds which enable the oxidation of LDL. Some neurogenerative diseases like Parkinson's disease which are known to be triggered by wrong foods and on the other hand can be reduced by nutraceuticals.

Nutraceuticals are associated with following properties:

- Antioxidant properties
- Antiinflammatory properties
- Insulin sensitivity
- Anticancerous properties
- Affecting cell differentiation
- Increasing enzyme activity which helps in detoxification
- Upkeep of DNA mending
- Upsurge the programmed cell death of cancer
- Diminution in cell propagation

5

Role of Fermentation on Rheological Properties and Sensory Attributes

Mamta Bhardwaj, Renuka Singh, Yogesh Kumar and D.C. Saxena

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Introduction

Fermentation is an integral part of food processing throughout the history of mankind. In beginning, it was mainly preservation method, then it became key process in substantial sensory characteristic development and now it is utilized to improve overall properties of outcome from major industries like bakery, dairy, beverages, etc. The human understanding of controlled fermentation process changes its fundamental objective by exploring its success in development of rheological and texture characteristics.

The biochemical transformation of raw food due to fermentation affects the organoleptic as well as rheological properties of a product. The changes in rheological as well as sensory properties is related with the modification of major component by the action of microorganism. For example, transformation of polysaccharides in bread dough by action of yeast produce ethanol, CO₂ and other simple compound which modify sensory as well as rheology of dough. The major micro-structural, bio-compositional and bio-chemical changes are due to microbial action are frequently described to understand the effect of fermentation on rheological as well as sensory properties of food products. The rate and quality of these associated major changes mainly depends upon concentration of saccharides for growth of microorganism as well as nature and existing microflora. Hence, a proper monitoring of changes in rheological and sensory properties is necessary to optimize the controlled fermentation as well as design of process parameters from engineering and consumer point of view.

The biochemical changes directly responsible for changes in basic rheological and sensory characteristic including flow behavior, consistency, viscoelastic properties, hardness, adhesiveness, color, aroma, flavor and mouthfeel. The food industry is so diverse and exploring new and possibilities to catch diverse consumer worldwide,

4

Rheological and Thermal Changes Occurring During Processing

Renuka Singh, Mamta Bhardwaj, D.C. Saxena

Department of Food Engineering & Technology, Sant Longowal Institute of Engineering & Technology

Contents

Introduction

Effect of processing on fruit and vegetable products

Effect of processing on rheological properties of dairy products 65

Effect of processing on rheological properties of chocolates

Effect of processing on rheological properties of meat

Thermal properties and processing effects

Dairy processing

Effect of freeze-drying on thermal properties of yoghurt

Effect of heating on thermal properties of milk fat

Effect of processing on thermal characteristics of meat

Effects of processing on thermal treatments on fruits

References

Introduction

Food processing comprise of techniques employed to transform raw ingredients into final food product or to preserve the food product. Food processing industry as well as at domestic scale the food processing methods aim at providing processed food products for daily consumption by humans and animals. Food processing aims at increasing the shelf life, preserve, make nutritious or ready to eat foods, and getting the best quality final products. There are various techniques and methods which come under food processing such as drying, dehydration, fermentation, pickling, freezing, mixing, pumping, pasteurization, cooking and homogenization etc.

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CHAPTER 1

Rheology: A Tool to Predict Quality of Foods

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ABSTRACT

The word “food” in itself is a complex system comprising of a wide range of biological components with various rheological characteristics. The diversity in these biological components in different food systems impart various compositional and structural variability to the food, thus, exhibiting different types of rheological behaviors viz. low viscosity fluids (e.g., milk), high viscosity fluids (e.g., ketchup) and hard solids (e.g., candies, and gel). The rheological behavior of food decides the stability and appearance of foods such as in the form of emulsions, pastes, and spreads, etc. Moreover, food quality, apart from its nutritional value, is a function of its rheological properties viz. structure and texture. The rheological characterization of food and food forming components is vital for predicting the food quality. Depending upon the form of a specific product (e.g., suspension, emulsion, gel, paste, liquid, solid, etc.) to be analyzed, a range of rheological techniques, tests, and equipments are available. Processing the rheological data in the form of models is vital to infer its physical significance in relation to the flow behavior. Therefore, the present chapter gives an insight into the application of rheological techniques, tests, and theoretical models to predict the quality of foods.

Chapter 4

Brown Rice Flour Rheology

Shumaila Jan, H.A. Pushpadass, D.C. Saxena, and R.P. Kingsly Ambrose

Introduction

Rice (*Oryza sativa* L.) is the staple food of about half the world's human population and particularly for the people in Asia. Brown rice is the dehulled rice obtained from paddy grains, with the bran and germ still intact. It consists of roughly 6–7% (w/w) of bran, 2–3% (w/w) of embryo, and 90% (w/w) of endosperm. The germ and bran layers are the nutrient-rich components in brown rice. The brown rice is normally subjected to abrasion to remove the bran layers from the endosperm and obtain white rice as the latter form is preferred by the consumers. The extent of removal of the bran layers is termed as degree of milling, which determines the whiteness of rice. During milling of brown rice, considerable amount of proteins and minerals are lost. In contrast, the brown rice with germ and bran layers is richer in nutrients such as proteins, lipids, fibres, vitamins, and minerals (Chen et al. 1998; Lamberts et al. 2007).

Rice and brown rice flours are used as primary ingredients in the preparation of many traditional and unique food products. For example, rice flour is used in the preparation of foods such as noodles, breakfast cereals, unleavened breads, snack food items, crackers, candies, and baby foods (Bao and Bergman 2004). In addition,

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Chapter

Ultrasound-Assisted Extraction of High Value Compounds from Agro-Industrial Byproducts

By *Anuradha Saini, Divyani Panwar, Parmjit S. Panesar, Anjineyulu Kothakota*

Book [Valorization of Agro-Industrial Byproducts](#)

Edition 1st Edition

First Published 2022

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Pages 24

eBook ISBN 9781003125679



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ABSTRACT

An ample amount of by-products is generated during different phases (handling chain, classification and grading, processing, storage, and marketing) of food processing. These by-products can be used to extract

Chapter

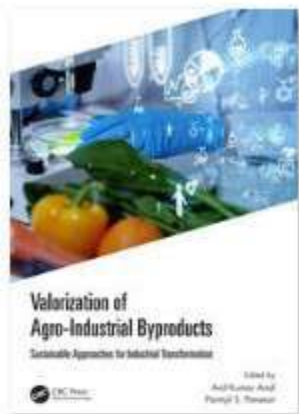
Agro-Industrial Waste as Wealth

Principles, Biorefinery, and Bioeconomy

By Anil Kumar Anal, Parmjit S. Panesar, Rupinder Kaur

Book: [Valorization of Agro-Industrial Byproducts](#)

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ABSTRACT

Food waste is not waste anymore. Every piece of waste is an opportunity, an opportunity that can be valorized into resources and energy that could be a viable strategy for reducing the environmental impacts of food waste. Essential nutrients and bioactive compounds can be extracted from agro-food waste that would otherwise remain unused. Going into the future, viable approaches for utilizing these wastes for the

Chapter

Production of Organic Acids from Agro-Industrial Waste and Their Industrial Utilization

By Navneet Kaur, Parmjit S. Panesar, Shilpi Ahluwalia

Book [Valorization of Agro-Industrial Byproducts](#)

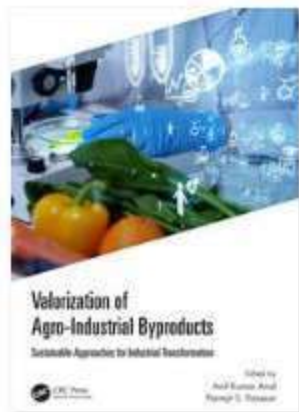
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ABSTRACT

Agro-industrial waste, being rich in nutrients, is used nowadays as an alternative for the production of bio-products like bioenergy, biofuels, and high value-added chemicals. Organic acids are biochemicals that have gained worldwide attention due to their vast industrial applications. Microbial fermentation processes

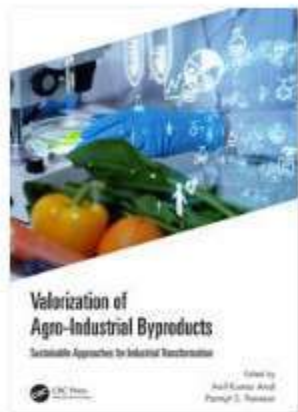
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Production of Biopigments from Agro-Industrial Waste

By Neegam Nain, Gunjan K. Katoch, Sawinder Kaur, Sushma Gurumayum, Prasad Rasane, Parmjit S. Panesar

Book: [Valorization of Agro-Industrial Byproducts](#)

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ABSTRACT

Owing to the negative impact of synthetic colourants on human health, nowadays, there is an increasing trend to replace these colourants with natural counterparts for their utilization in the food-processing industry. These natural counterparts or natural pigments are mainly isolated and derived from plant sources

Sources, Composition, and Characterization of Agro-Industrial Byproducts

By *Dipak Das, Parmjit S. Panesar, Gaurav Panesar, Yakindra Timilsena*

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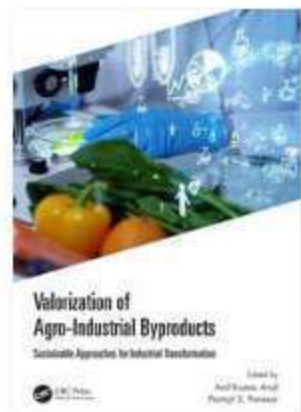
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ABSTRACT

Agro-industrial by-products from the food-processing industry are increasing significantly with the increase in global population, globalization of the food trade, and subsequent increase in food-processing operations

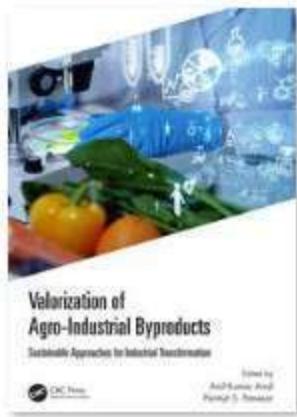
Chapter

Production of Enzymes from Agro-Industrial Byproducts

By Rupinder Kaur, Parmjit S. Panesar, Gisha Singla

Book [Valorization of Agro-Industrial Byproducts](#)

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ABSTRACT

Enzymes are crucial for humans and have infinite applications in various sectors, especially in the various bioprocess techniques. Although enzymes can be isolated from plants as well as animals, microbial sources

11

Prebiotics and their Role in Functional Food Product Development

Divyani Panwar, Parmjit Singh Panesar and Anuradha Saini

Food Biotechnology Research Laboratory, Department of Food Engineering & Technology, Sant Longowal Institute of Engineering and Technology, Longowal, -148 106, Punjab, India

11.1 Introduction

For a long time, apart from the basic role of food to provide nutrients to humans for their necessary growth and development, some important aspects such as improvement of health and preventing diseases have been gaining importance. With the boosted interest of consumers in self-care and enhanced quality of life, research to understand the impact of interaction between the diet, gut and health has increased rapidly (Niva 2007; Rastall 2010). The human gut is known to be one of the most active metabolic organs containing a complex community of microorganisms or microbiota that affects the host's health (Holscher 2017). Moreover, it is a well-established fact that the gut microbiota maintains a synergetic relationship with the host and plays a critical role in various biological functions including utilization of nutrients, assistance in host digestion, strengthening of the immune system and protection against infectious pathogens (Bindels *et al.* 2015). However, certain undesirable changes/imbalance in patterns of gut microbiota known as dysbiosis are responsible for specific gastrointestinal and immune-mediated disorders such as celiac disease, Crohn's disease, obesity, liver diseases, multiple sclerosis, arthritis and cancer (Anadón *et al.* 2016).

This has led to the idea that deliberate manipulation in composition or metabolic activity of gut microbiota can be utilized as a therapeutic target to improve host health. As a consequence, utilization of functional foods and dietary supplements such as prebiotics, probiotics and synbiotics to regulate gut microbiota has gained interest, which has led to a brisk augmentation in the global market (de Preter and Verbeke 2014). The global market size for functional foods is currently estimated at USD 161.50 billion, and is predicted to rise to approximately USD 275.80 billion by the year 2025 (Figure 11.1). The chief leaders of the functional food market include the United States, Japan and Europe, whereas India, China and Latin America, along with some other Asian countries, are experiencing a high market growth rate (<https://www.grandviewresearch.com/industry-analysis/functional-food-market/>).

Probiotics, Prebiotics and Synbiotics: Technological Advancements Towards Safety and Industrial Applications, First Edition. Edited by Parmjit Singh Panesar and Anil Kumar Anal.
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Galactooligosaccharides as Potential Prebiotics

Rupinder Kaur, Parmjit Singh Panesar

Book Editor(s):Parmjit Singh Panesar, Anil Kumar Anal

First published: 07 January 2022 | <https://doi.org/10.1002/9781119702160.ch12> | Citations: 1

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Summary

Over the past decade, galactooligosaccharides (GOS) have been globally recognized as prebiotic substances and have fascinated various researchers worldwide. Owing to their various physiological properties as well as enormous health benefits, the demand for GOS among the growing population has substantially increased. GOS can be extracted from a variety of natural sources, but in small quantities, and there is a need to scale up GOS production to fulfill ever-increasing demand. Both chemical and enzymatic methods have been reported for production, yet in comparison to the former, the latter techniques have been most widely explored owing to the various techno-economic benefits. Various biotechnological approaches, such as whole cells, free, immobilized and recombinant enzymes, have been proposed by researchers globally to enhance the

14

Lactulose: Production and Potential Applications

Shweta Kumari¹, Parmjit Singh Panesar², Divyani Panwar² and Gisha Singla²

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14.1 Introduction

The disaccharide lactulose (4-O- β -D-galactopyranosyl-D-fructofuranose) is a non-digestible compound made up of two monosaccharides, fructose and galactose, bonded together with a β -1,4-glycosidic bond. It is a “bifidus factor”, which is produced by lactose isomerization. The β -glycosidic linkage present in lactulose is not hydrolyzed by digestive enzymes and the ingested lactulose is directly passed through the colon in an unaltered form (Ruttloff *et al.* 1967). It is generally utilized by a large number of probiotic bacteria such as *Bifidobacterium* spp., present in human intestine (Figure 14.1) (Tamura *et al.* 1993). Due to its prebiotic property, it induces the growth of healthy gut bacteria such as bifidobacteria and lactobacilli (Table 14.1) and also inhibits the growth of pathogenic bacteria such as *Salmonella* (Aider and de Halleux 2007; Panesar *et al.* 2009).

14.2 Structure and Properties

Lactulose is a non-digestible synthetic isomer made up of two monomers, galactose and fructose. The structural and physicochemical properties of lactulose are shown in Table 14.2. Lactulose is predominantly found in a variety of isomeric forms including α - or β -pyranose, α - or β -furanose, and acyclic forms. Among these, α -furanose β -pyranose and β -furanose isomers are mainly formed during the currently available methods of lactulose production at different ratios, but the presence of α -pyranose has not been reported (Aït-Aïssa and Aider 2014a).

Lactulose syrup available commercially is a clear yellow and odorless sweet syrup containing about 80% solid contents (Schumann 2002). Moreover, pure lactulose is commercially available in white crystalline form and is made up of anhydride and trihydrate structures



Potential of Nanotechnology in Food Analysis and Quality Improvement

8

Anuradha Saini, Divyani Panwar, Parmjit S. Panesar,
and Pranjal Chandra

Abstract

Nanotechnology has reformed the food sector with producing better-quality food products through its contribution in functional foods development, food nanopackaging, and nanodevices for food analysis. The existing techniques such as culture-based techniques, sensory analysis, and GC techniques for food analysis are time consuming, cumbersome, and labour intensive. To overcome these drawbacks, nanotechnology is nowadays applied to develop techniques that show more accurate and precise results, which is important for maintaining food quality. Nanotechnology in food analysis is used to detect toxins, adulterants, pathogens, sugar, and antioxidants using nanodevices like nanosensors. Furthermore, nanotechnology can also be applied in food packaging and processing domain to sense food spoilage as well as improve food quality. This chapter delivers comprehensive information about the value and potential of nanotechnology for food analysis, packaging, and quality improvement in the food processing domain.

Keywords

Nanotechnology · Food analysis · Food packaging · Nanosensors · Quality

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P. Chandra, P. S. Panesar (eds.), *Nanosensing and Bioanalytical Technologies in Food Quality Control*, https://doi.org/10.1007/978-981-16-7029-9_8

Recovery of Nutrients and Transformations of Municipal/Domestic Food Waste

Divyani Panwar, Parmjit S. Panesar, Gisha Singla, Meena Krishania, Avinash Thakur

Book Editor(s): Carol Sze Ki Lin, Guneet Kaur, Chong Li, Xiaofeng Yang

First published: 25 September 2020 | <https://doi.org/10.1002/9781119502753.ch6>



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Summary

This chapter provides comprehensive information on different aspects of characteristics of food waste, its supply chain and recovery of valuable products from anaerobic digestion of food waste, and novel approaches for the transformation of food waste into valuable products through chemical and biotechnological routes. Food waste is generated throughout the food supply chain and is produced when the desired product is separated from undesirable product. Anaerobic digestion is an efficient and vital technology used globally for the proper disposal and treatment of food waste. This technology has proven to be a promising and environmentally friendly approach for the management of food waste as well as the production of a variety of valuable products including biogas and digestate. The chapter describes the biotechnological and chemical

Biotechnological approach for valorization of whey for value-added products

Rupinder Kaur, Divyani Panwar and Parmjit S. Panesar

Glossary

Bioaugmentation	It is a technique in which archaea or bacterial cultures are added to speed up the rate of degradation of the contaminant.
Crabtree effect	It is the phenomenon in which yeast (<i>Saccharomyces cerevisiae</i>) produces ethanol in aerobic conditions and high glucose concentrations rather than producing biomass via the tricarboxylic acid (TCA) cycle.
Enzymes	Enzymes are macromolecular biological catalysts that accelerate chemical reactions.
Exopolysaccharide (EPS)	These are high molecular weight natural polymers composed of sugar residues and are secreted by microorganisms into their environment.
Fermentation	It is a metabolic process that produces chemical changes in organic substances through the action of enzymes of microbial origin.
Immobilization	Cells/enzymes physically confined or localized in certain region of space with retention of their catalytic activities, which can be used repeatedly and continuously.
Prebiotics	These can be defined as nondigestible food ingredients that allow specific changes both in the composition and/or activity in the gastrointestinal microbiota, thus, conferring various health benefits upon the host.

13.1 Introduction

Dairy practices have been considered as an integral part of human civilization since bygone times. This industry is an indispensable part of the food industry, which processes raw milk into numerous dairy products with the subsequent generation of different by-products (Fig. 13.1). This sector plays a momentous role in the growth of global economics as well as acts as a proactive contributor to human nutrition. According to the FAO (2018), world milk production was estimated to be 811 million tons in 2017, which was up 1.4% from 2016. An enormous amount of waste, which is estimated between 3.739 and 11.217 million cubic meters is generated from the dairy industry, including both solid and liquid wastes. The effluents discharged from the dairy industry exhibit different characteristics depending upon the type of product produced, climate, operating conditions as well as cleaning-in-place practices (Prazeres et al., 2012).

During the manufacturing of dairy products, approximately 85%–90% of the total milk used is discarded as the liquid by-product known as whey (Panesar and Kennedy, 2012). Whey is a milk serum or watery medium in which all milk phases are homogeneously dispersed (Kosseva, 2013). The total worldwide production of whey is around 180 to 190 million tons per year, among which, the major producers are the European Union and the United States (Fig. 13.2), which contribute approximately 70% of the global whey production (Mollea et al., 2013). Further, it is estimated that the global production will increase to 200 million tons per year (Domingos et al., 2016). It is a rich source of nutrients such as lactose (4.5%–6%), proteins (0.6%–1.1%), water (93%–94%) as well as other micronutrients (Carvalho et al., 2013). Owing to these, the biological oxygen demand (BOD) as well as chemical oxygen demand (COD) levels of whey are quite high varying between 35 and 60 g/L and 50 and 102 g/L respectively (Remón et al., 2016); thereby leading to serious environmental problems.

CHAPTER 3

BIO-PROCESSING OF FOODS: CURRENT SCENARIO AND FUTURE PROSPECTS

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CONTENTS

3.1	Introduction.....	48
3.2	Fermented Foods.....	48
3.3	Alcoholic Beverages	57
3.4	Functional Foods.....	58
3.5	Enzymes.....	60
3.6	Genetically Modified Foods	61
3.7	Food Additives	63
3.8	Single Cell Protein	68
3.9	Biosensors.....	69
3.10	Concluding Remarks.....	71
	Keywords	71
	References.....	71



Chapter 1 - Science and Technology of Fruit Wines: An Overview

V.K. Joshi ¹, P.S. Panesar ², V.S. Rana ¹, S. Kaur ²

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Abstract

Wine is one of the oldest known alcoholic beverages, tracing its

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Detection and Prevention of Blackhole Attacks in Wireless Sensor Networks

Surinder Kaur, V. K. Jain & Yogesh Chahra

Conference paper | First Online: 11 October 2017
 Part of the *Lecture Notes in Computer Science* book series (LNPS; volume 10618)

Abstract

In recent past Wireless Sensor Network has emerged as a promising technology and has proved to be a leading motivational force for a new innovation namely Internet of Things. Due to characteristics constraints, security is one of key challenge to sustain the performance of wireless sensor networks. Blackhole attack is a major threat for Wireless Sensor Network in which an intruder absorbs the traffic intended for base station by introducing a malicious...

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Surinder Singh, Veerpal Kaur All Authors

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Abstract

Abstract: This article proposed solid core PCF with sensing ring for different blood component detection. Analytical validation of proposed sensor has been done by using FEM numerical technique in term of relative sensitivity and confinement loss. In this PCF design, sensing liquid filled into uniform circular ring and evanescent field interact with sensing liquid for better light matter interaction. This proposed PCF sensor design overcome some experimental challenge such as leakage of light and sensing analyte...

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Abstract

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Wavelength-Convertible Optical Switch Based on Cross-Gain Modulation Effect of SOA

Sukhjit Singh & Swinder Singh

Conference paper | First Online: 17 May 2018

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Part of the *Advances in Intelligent Systems and Computing* book series (AISC, volume 705)

Abstract

All-optical switching based on wavelength conversion using cross-gain modulation (XGM) effect of semiconductor optical amplifier (SOA) has been proposed and demonstrated for 10 Gbps NRZ modulated data signals. Error-free operation is successfully achieved for converted signal with Q-factor of >28.96 at optimum input probe power of -8 dBm. The proposed simple and cost-effective structure of optical switch can be utilized for future ultra-fast optical switching circuit and to expand the optical network.

Keywords

Cross-gain modulation (XGM) Semiconductor optical amplifier Wavelength conversion Optical switching

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ABSTRACT

59b. On the Rice Husk Ash Admixing with Cement: Preparation, Characterization and Analysis

Monday, October 30, 2017 08:18 AM - 08:36 AM
 Minneapolis Convention Center - J110

On the Rice Husk Ash Admixing with Cement: Preparation, Characterization and Analysis
ABSTRACT

Rice husk is the outermost part of rice paddy. It covers about 20 to 25 % of the rice weight. Rice husk can be converted into rice husk ash (RHA) by burning process. The chemical composition of rice husk is found to vary from one sample to another due to the differences in the type of paddy, crop year, climate and geographical conditions.^[1]

Cement is a binder, a substance used in construction that sets, hardens and adheres to other materials, binding them together.^[2] Cements are classified as calcium silicate and calcium aluminate cement. Calcium silicate cement is further classified into Portland and Slag, while calcium aluminate is classified into High alumina and Pozzolana cement.^[3]

Portland cement is by far the most common type of cement in widespread use around the world. This cement is made by calcining limestone (CaCO₃) with other materials (such as clay) to 1450 °C in a kiln. Calcium oxide, so formed is then chemically fused with the other materials to form calcium silicates and other cementitious compounds. The resulting clinker is ground with a small amount of gypsum into a powder to make 'ordinary Portland cement', the most commonly used type of cement (often referred to as OPC).

Rice husk ash (RHA) fulfills the physical characteristics and chemical composition of mineral admixtures. RHA is composed mostly of silica in amorphous form (85-90%) and it has a highly micro-porous structure which makes it suitable to replace cement.

In the present work, rice husk ash is prepared and characterized. A varied percentage of RHA is used as an admixture with ordinary Portland cement in concrete to formulate samples. Further, compressive and flexural strength parameters of concrete are determined by Vicat test, float test, compression test and initial & final setting times. It has been found that rice husk ash substitution for ordinary Portland cement up to 30% is acceptable. On increase in RHA percentage, compressive strength decreases rapidly.

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ABSTRACT

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ABSTRACT

196v: Antimicrobial Polymers: Present State of the Art

Monday, October 30, 2017 08:15 PM - 04:45 PM
 Minnetonka Convention Center - Exhibit Hall B

Antimicrobial Polymers: Present State of the Art.

ABSTRACT

Antimicrobial polymers represent a very assuring class of therapeutics with unique characteristics for treating microbial infections. These polymers usually exhibit long-term activity and limited residual toxicity, are chemically stable, non-volatile and do not permeate through the skin.^{1,2} Antimicrobial polymers were discovered in 1965 and since then, have attracted considerable attention in academic as well as industrial research.

Antimicrobial polymers are classified as bound or leaching antimicrobials depending on the polymer material. These are divided into three types: polymeric biocides, biocidal polymers, and bio-de-releasing polymers. These antimicrobial polymers find major applications in the medical, food packaging, and textile industries.

This work is an attempt to portray the present state of the art and the developments in the domain of antimicrobial polymers. Antimicrobial mechanisms exhibiting passive and active action and substrate material types containing bound and leaching antimicrobials are discussed. This work also deals with canvassing the applications of these antimicrobial polymers in the medical, food, and textile industries.

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[1] Santos, M. R. E.; Fonseca, A. C.; Mandonga, P. V.; Branco, R.; Serra, A. C.; Morais, P. V. and Coelho, J. F. J. Recent Developments in Antimicrobial Polymers: A Review. *Materials* 2016; 9, pp. 599-631.

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ABSTRACT

361: A Mathematical Model Based on Artificial Neural Network for Ethylene/Norbornene Copolymerization Catalyzed By 2-(tetramethylcyclopentadienyl)-4,6-Di-Tert-Butylphenoxytitanium Dichloride

Sunday, October 29, 2017 05:45 PM - 06:00 PM
 Minneapolis Convention Center - 217E

A Mathematical Model based on Artificial Neural Network for ethylene/norbornene copolymerization catalyzed by 2-(tetramethylcyclopentadienyl)-4,6-di-tert-butylphenoxytitanium dichloride

ABSTRACT

Ethylene/norbornene (E-NB) copolymer is one of the most promising industrial thermoplastic polymers with high glass transition temperature (T_g), excellent moisture barrier properties, chemical resistance, and optical clarity. It is an attractive choice as a novel substrate material for high density data storage devices, packaging, and optical/biomedical applications.^[1]

Titanium based metallocene catalysts with a pendant nitrogen donor or pendant oxygen donor on the cyclopentadienyl ring, are found to be good at catalyzing ethylene/norbornene copolymerization with noteworthy catalytic activity and efficient norbornene incorporation for the ethylene/norbornene copolymerization.^[2]

The use of neural networks (NNs) has become progressively popular for applications where the mechanistic description of the interrelation of dependent and independent variables is either obscure or very complex.^[3] The neural network consists of processing neurons and information flow channels between the neurons, usually called 'interconnects'. Each processing neuron calculates the weighted sum of all interconnected signals

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ABSTRACT

Experimental data were taken from Jiaqiao et al. The effect of temperature, monomer to comonomer concentration ratio and cocatalyst to catalyst concentration ratio on catalyst activity, yields, molecular weights & distribution and glass transition temperature of the copolymer has been studied using neural network approach in MATLAB® 7.10.0 (R2015a) software.^[6]

References

- [1] Kaminsky W, Bark A, and Arndt M, *Makromol Chem Macromol Symp*, **47-83**, (1991).
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764h: Constrained Geometry Single Site Catalysts for Olefin Polymerization

Thursday, November 2, 2017 05:00 PM - 05:15 PM
Minneapolis Convention Center - #1120

Constrained Geometry Single Site Catalysts for Olefin Polymerization

ABSTRACT

Polyolefins are commercially important plastics. These are available in compounds of widely different structure as copolymers, in polymer mixtures as filled compositions and as cross-linkable products etc. Single site polymerization catalysts, with the generic name of metallocenes, are currently used industrially to produce various polyolefins with more precise molecular architecture than those can be produced by any conventional polymerization methods like Ziegler-Natta type catalysts. Metallocenes are known for the stereoselective polymerization of a range of polymers. It is now a well-accepted fact that metallocene offers several advantages over the traditional Ziegler-Natta catalysts. Many metallocenes are up to hundred-fold more active because the initiators are homogeneous and nearly each atom of transition metal is active. Stereoselectivity can be controlled and varied to produce different stereoregular products by appropriate choice of the metallocene ligands and reaction conditions. In single site polymerization, there are different kinetic processes, including catalyst activation and deactivation, chain propagation, chain transfer by beta-hydrogen elimination etc. These reactions are mediated by the metal/ligand/counter-ion complex, where the key challenge is to first understand, and then rationally design, the ligands and the counterion to produce a polymer with a desired molecular architecture. The major impact of Metallocene catalysts on the polyolefin industry is related to the fact that these catalysts can produce polymers with controlled microstructure. Presently polymer manufacturing companies the world over are examining the possibility of using the metallocene catalyst to produce polyolefins. In this paper, the development of the metallocene catalysts and co-catalysts from their discovery to their present state of the art is presented. This paper also focuses on various mechanistic aspects of applications of single site catalyst systems in polymer industry.

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Polyolefins are commercially important plastics. These are available in compounds of widely different structure as copolymers, in polymer mixtures as filled compositions and as cross-linkable products etc. Single site polymerization catalysts, with the generic name of metallocenes, are currently used industrially to produce various polyolefins with more precise molecular architecture than those can be produced by any conventional polymerization methods like Ziegler-Natta type catalysts. Metallocenes are known for the stereoselective polymerization of a range of polymers. It is now a well-accepted fact that metallocene offers several advantages over the traditional Ziegler-Natta catalysts. Many metallocenes are up to hundred-fold more active because the initiators are homogeneous and nearly each atom of transition metal is active. Stereoselectivity can be controlled and varied to produce different stereoregular products by appropriate choice of the metallocene ligands and reaction conditions. In single site polymerization, there are different kinetic processes, including catalyst activation and deactivation, chain propagation, chain transfer by beta-hydrogen elimination etc. These reactions are mediated by the metal/ligand/counter-ion complex, where the key challenge is to first understand, and then rationally design, the ligands and the counterion to produce a polymer with a desired molecular architecture. The major impact of Metallocene catalysts on the polyolefin industry is related to the fact that these catalysts can produce polymers with controlled microstructure. Presently polymer manufacturing companies the world over are examining the possibility of using the metallocene catalyst to produce polyolefins. In this paper, the development of the metallocene catalysts and co-catalysts from their discovery to their present state of the art is presented. This paper also focuses on various mechanistic aspects of applications of single site catalyst systems in polymer industry.

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Sol-gel synthesis of transition metal oxides based electrode materials for supercapacitors
 Dhiraj Sud

Supercapacitors are electrochemical devices used for portable consumer electronics devices, electric devices, and large-scale grids. The advantageous features of supercapacitors are high power density, fast charge/discharge rate, long life cycle, a wide range of operating temperature (-40 to 70°C), environment-friendly and low maintenance cost. Supercapacitors store the charge either by ion adsorption at the electrode/electrolyte interface (electrochemical double layer capacitors) or reversible Faradaic reactions (pseudocapacitors). Most of the commercial supercapacitors store energy by electric double layer formation and utilize the carbon as an electrode material. Carbon-based electrode materials have excellent cycling stability, high lifetime cycle and economic viability but low energy density (3-5Wh/kg) and poor electrochemical stability are the limitations. Transition metal oxides have been considered suitable candidates for the energy storage by pseudocapacitance. The metal oxides also provide higher energy density and better electrochemical stability. Sol-gel is a simple and cheap method of synthesis which yields the products of high purity and good homogeneity. Sol-gel methods have been successfully developed to prepare many metal oxides such as TiO₂, V₂O₅, Mn₃O₄, Fe₃O₄, Co₃O₄, NiO, Cu₂O, ZnO as well as binary metal oxides. The process offers the advantages of formation of materials with diverse morphological structures and has also been successfully applied for the preparation of nanoparticles, films, and composites. The electrode material prepared by this technique exhibits high surface area and improved electrochemical behavior which can be further controlled by variation of surfactants, solvents, reaction time and temperature. Thus the sol-gel method is promising, an environment friendly technique to synthesize transition metal oxide based electrode materials with superior electrochemical properties for their use in supercapacitors.

Keywords
 Supercapacitors; Electrostatic Capacitors; Pseudocapacitors; Charge Storage; Sol-Gel Synthesis; Transition Metal Oxides

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 Dhiraj Sud

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Jaspreet Singh & Ajit Shrivastava

Conference paper | First Online: 17 May 2018

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Abstract

IR thermography is a noninvasive and non-contact type radiometric technique which creates the 2D thermal images based on infrared radiations. Usually, these are gray-level images which provide poor color contrast. However, various pseudo-coloring algorithms are available to transform these images into RGB space, but contrast enhancement is still required for better visualization of thermograms. In this study, the non-training contrast enhancement algorithm is proposed for IR thermograms. The contrast enhancement in this proposed methodology is achieved by: (i) eliminating the background interference using optimal temperature thresholding and (ii) color enhancement using decorrelation contrast stretching. The

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Adaptive TDMA Based QoS-Aware MAC protocol for Hierarchical Wireless Sensor Networks

Dilip Kumar^{1*} and Tarunpreet Kaur¹
¹SLIET Longowal, Punjab, India

Abstract. This paper presents an adaptive time division multiple access based energy efficient medium access control (ATDMA-MAC) protocol to handle the variable traffic load while maintaining the quality of service (QoS) assurance for delay-sensitive applications. The ATDMA-MAC protocol dynamically allocates time slots to the sensor nodes based on their queue length information to achieve minimum latency for a wide range traffic load. Furthermore, the analytical model of energy consumption has derived to demonstrate the superiority of the ATDMA-MAC protocol. Simulation results show that the proposed ATDMA-MAC protocol sends more data against existing TDMA based MAC protocols with minimum transmission latency and energy consumption.

Keywords: wireless sensor networks, MAC, TDMA, latency, QoS

1. Introduction

In the past decade, wireless sensor networks (WSNs) have come across as one of the significant technologies which incorporate automatic sensing, processing, and wireless transmission into small electronic devices called sensor nodes [1]. The information received from the sensor nodes is transmitted to the base station for processing and analyzing [2]. The past research on WSN is mainly focussed towards the

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Prevention of Flooding Attacks in Mobile Ad Hoc Networks

Gurjinder Kaur, V. K. Jain & Yogesh Chahal

Conference paper | [First Online: 28 March 2019](#)
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Abstract

Mobile ad hoc network (MANET) in spite of having numerous advantages is still vulnerable to various security breaches. Most of the attacks in MANET are initiated during route discovery process. Flooding attack is found to be most destructive because its severity often leads to exhaustion of resources and bandwidth of MANET. In this paper in order to confront the flooding attack, a new two-step protection method (TSPM) is proposed. The analysis of obtained simulation results with the proposed TSPM establishes that the proposed method isolates the attackers efficiently.

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Efficiency estimation of all optical contention detection in optical router for 60 Gbps

Publisher: IEEE

Dibag Singh, Gaurinder Singh, All Authors

1 Paper 49 Full Citations Text Views

Abstract:
 In this paper, optical logic circuit based on XGM-FWM effect of single SOA symmetry for optical packet contention detection is presented. All the decisions making and processing of incoming signals are performed in optical domain for data rate of 60 Gbps. The contention detector efficiency is analyzed for increase in input optical power with different pump power.

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Date of Conference: 05-11 February 2018
Date Added to IEEE Xplore: 07 May 2019

INSPEC Accession Number: 17751486
DOI: 10.1109/ICMAP.2018.8354591

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1 Introduction
 Data transmission capability of photonic communication is increasing every day due to their speed. The increasing demand for high speed internet connectivity raise the requirement of ultra-high speed operations and networks with capacity to process high traffic of optical packets. Most of the router operations are performed in electronic domain, which is the major cause of bottleneck for achieving ultra-high speed operations [1]. All optical packet contention detector is an ideal method for the design of optical router with higher speed, improved stability, smaller size and lower power consumption. However, digital processing functions like packet generation, label mapping [2], and packet header modification [3] are not possible in all optical domain. Hence, hybrid optoelectronic approach is used for the design of optical router. In this paper, optical logic circuit based on XGM-FWM effect of single SOA symmetry for optical packet contention detection is presented. All the decisions making and processing of incoming signals are performed in optical domain for data rate of 60 Gbps. The contention detector efficiency is analyzed for increase in input optical power with different pump power.

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Gurwinder Singh, Birmohan Singh & Manpreet Kaur

Conference paper | First Online: 07 December 2018

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Part of the [Lecture Notes in Electrical Engineering](#) book series (LNEE volume 524)

Abstract

Recognizing the epileptogenic area of a brain is done by analyzing the electroencephalogram signal. This area is responsible for the occurrence of seizure activity in a brain. In this paper, a methodology has been presented for the analysis of electroencephalogram to recognize epileptogenic area of brain. Ensemble empirical mode decomposition (EMD) has been used for the estimation of intrinsic mode functions (IMFs), and six parameters consisting of statistical and frequency-based feature have been extracted from first ten IMFs. The Relief

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A Hybrid Approach for Speckle Reduction in Ultrasound

Nishitha Bewal, Manminder Singh  & Birmohan Singh

Conference paper | [First Online: 03 November 2018](#)

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Abstract

Speckle noise content present in ultrasound (US) images degrades the image contrast and makes image interpretation difficult. In this paper, a hybrid speckle reduction method has been proposed in which wavelet transform, 2D Wiener filter, and morphological operations are combined. The proposed method reduces speckle noise efficiently and enhances the US image. A comparison of the proposed method is made by utilizing classical speckle reduction filters including combinations of Fourier and homomorphic filters. For performance evaluation, we have used mean square error (MSE) along with peak signal-to-noise ratio (PSNR) for

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Mutual Reputation Based Service Mapping in Cloud Environment

Neeraj Yadav, Major Singh Goraya, Damanpreet Singh

Abstract—Due to increase in the number of cloud users (CUs), the number of cloud service providers (CSPs) have also been increased. Among the number of available CSPs, the selection of a suitable CSP for a CU has become a complicated issue. In literature, the reputation of CSPs is used to evaluate their suitability. Since, cloud has a strong business perspective, suitability of CU for a CSP is equally important. The mutual suitability of CSPs and CUs can give new dimensions to service orchestration in cloud. Therefore, this paper proposes a mutual reputation-based service mapping framework for the cloud environment. The mutual reputation of both the CSPs and CUs is used during the service mapping. The reputation of CSPs and CUs is evaluated based on their quality of service (QoS) attributes and for evaluating the reputation of CUs the parameters are defined. Analytical Hierarchy Process (AHP) is used to evaluate the reputation of CSPs and CUs. The mutual reputation-based mapping is depicted through a case study in the paper. Results prove the enhanced performance of the proposed framework in terms of system overhead in comparison to an existing framework.

Keywords—service mapping, quality of service, reputation, ranking, cloud computing

many researchers for the selection of a suitable CSP for a CU [2,3,4].

Cloud is a business model where the relationship between CC and CU is set up [5,6]. In business, the identification and retention of the high value and potential customers are important for the competitive industry [7]. In this context, Selirab and Khalafat [8] stressed the importance of determining the profitability of customers before deploying resources to them in accordance with their customer value. A TRCSM framework is also proposed in paper [9], two-way ranking based service mapping framework (TRCSM) is proposed which ranks both the participating entities (CSPs and service customers) during service mapping based on their owned and required quality of service (QoS) attributes value. The present research work gives simultaneous consideration to evaluate the suitability of customer along with service provider in cloud environment. Since many CUs may compete for a service from a CSP at an instance, the selection of a suitable CU for a CSP is also important. The mutual suitability of both the participating entities (i.e. CSP and CU) in a service transaction (service delivery and consumption by a CSP and a CU respectively) will give new dimensions to service orchestration in the cloud environment.

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Abstract
Due to increase in the number of cloud users (CUs), the number of cloud service providers (CSPs) have also been increased. Among the number of available CSPs, the selection of a suitable CSP for a CU has become a complicated issue. In literature, the reputation of CSPs is used to evaluate their suitability. Since, cloud has a strong business perspective, suitability of CU for a CSP is equally important. The mutual suitability of CSPs and CUs can give new dimensions to service orchestration in cloud. Therefore, this paper proposes a mutual reputation-based service mapping framework for the cloud environment. The mutual reputation of both the CSPs and CUs is used during the service mapping. The reputation of CSPs and CUs is evaluated based on their quality of service (QoS) attributes and for evaluating the reputation of CUs the parameters are defined. Analytical Hierarchy Process (AHP) is used to evaluate the reputation of CSPs and CUs. The mutual reputation-based mapping is depicted through a case study in the paper. Results prove the enhanced performance of the proposed framework in terms of system overhead in comparison to an existing framework.

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Power and Resource-Aware VM Placement in Cloud Environment

Publisher: IEEE | Cite This | PDF

Author(s): Netai Singh, Damanpreet Singh, Major Singh Goudra, All Authors

2106 Paper Citations | Full Text Views

Abstract: Cloud computing provides various services to the cloud consumers based on demand and pay per use basis. To improve the system performance (such as energy efficiency, resource utilization (RU), etc.) more than one virtual machine (VM) can be deployed on a server. Efficient VM placement policy increases the system performance by utilizing all the computing resources at their maximum threshold limit and reduce the probability to become a server overloaded/underloaded. Overloaded/underloaded servers consume more energy and increase the number of VM migration in comparison to the server which is in a normal state. In this paper, energy and resource aware VM Placement (ERAP) algorithm is presented. This algorithm considers both, energy as well as central processing unit (CPU) utilization to deploy the VMs on the servers. CloudSim toolkit is used to analyze the behavior of the ERAP algorithm. The effectiveness of the ERAP algorithm is tested on real workload traces of Planet Lab. Results show that ERAP algorithm performs better in comparison to the existing algorithm on the account of the number of VM migrations, total energy consumption, number of servers shutdowns, and average service level agreement (SLA) violation rate. Results show that on average 10-12% energy consumption is minimized in contrast to the existing algorithm.

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Concentric Layered Architecture for Multi-Level Clustering in Large-Scale Wireless Sensor Networks

Publisher: IEEE | Cite This | PDF

Author(s): Harnampreet Singh, Damanpreet Singh, All Authors

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Abstract: Multi-level clustering offers energy efficient data gathering and much needed scalability in large-scale wireless sensor networks (WSNs). Although, for multi-level networks have been designed for static clustering and manually deployed WSNs, but no work has been done for randomly deployed WSN performing dynamic clustering. Moreover, there is a lack of structured framework for evolutionary optimization based multi-level clustering protocols. Design of multi-level clustering depends on two parameters: 1) optimal position of apex and 2) number of sensor nodes at each layer. Based on these parameters, a concentric layered architecture (CLA) is designed in this paper to perform multi-level clustering in randomly deployed WSN. CLA divide the network into layers based on node density and number of sensor nodes at each layer. Further, CLA is evaluated on an evolutionary optimization technique based clustering approach namely PSO-C. Simulation results show that the proposed CLA significantly improves the network lifetime and energy efficiency.

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Fracture Toughness and Fatigue Behaviour of Variably Precipitated Inconel 625/AISI 304L Welds

Sandeep Singh Sandhu & A. S. Shahi

Conference paper | First Online: 13 May 2018
4578 Accesses | 1 Citations

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Nickel based superalloy Inconel 625 welds were fabricated by depositing its filler in AISI 304L substrate using a single-V groove configuration and employing SMAW (Shielded metal arc welding) as well as GMAW (gas metal arc welding) process. Fatigue crack growth and fracture toughness characteristics of SMA weld Inconel 625 compact tension specimens of thickness 25 mm in as welded and after post weld thermal aging treatments (temperatures ranging from 650 to 850 °C and duration of 10 and 100 h) were investigated on the basis of curves plotted between crack length and number of cycles. Fatigue crack growth rate was examined in delta K range of 21–70 MPa√m. The degree of precipitation in these welds was checked due to

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Abstract: A scheme of a hybrid controller has been designed for trajectory control of end-effector for 1-DOF flexible arm URM. The hybrid controller scheme includes an overwholming controller and PID controller, which leads the robust and steady stable trajectory control. This controller strategy requires information of base velocity, arm parameters and underwater environmental conditions. The modeling and simulation of trajectory control involves modeling of base, flexible arm and hybrid controller. Modeling and simulation was done using bond graph technique. The underwater robot was modeled considering gravity, buoyant force and hydrostatic force. The arm is modeled as per Euler beam theory and is divided in six equal segments. The developed model further allows estimation of the deflection of tip in two directions. The complete dynamics of the underwater welding robot was analyzed, which revealed some significant trajectories of the tip in presence of various forces. SYMBOLSONATA software was used for simulating the bond graph model of underwater robot.

Keywords: Bond graph modeling, underwater welding robot, Overwholming controller, buoyancy, hydrostatic force.

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Computational analysis of some partial differential equations using efficient compact finite difference method

AIP Conference Proceedings 2435, 020050 (2022); <https://doi.org/10.1063/5.0084393>

Rajnket Kaur¹ and V. K. Kukreja²

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ABSTRACT

In this article, the nonlinear partial differential equations are solved using compact finite difference method (CFDM6) of the sixth order accuracy. The mathematical models considered for the implementation of the proposed method are Burgers equation, Burgers-Fisher equation, modified Burgers equation and Burgers-Huxley equation. The execution of the method deals the spatial domain with CFDM6 and time integration with SSP-RK43. The efficacy of CFDM6 accentuates on the stability, which is handled using matrix stability analysis. To certify the accuracy and effectiveness of the proposed method, the results obtained for various test problems are compared with analytical solutions in literature. The L_2 and L_∞ error norms are calculated for test problems showing the efficacy of the method.

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Emerging Trends in Mechanical Engineering pp 259-278 | Cite as

Performance and Emission Testing of Diesel Engine Using Blends of Biodiesel from Castor Oil and Neem Oil Prepared Using Lithium-Doped CaO Nano-Catalyst

Upender Kumar[✉] & Pardeep Gupta

Conference paper | First Online: 12 December 2020

294 Accesses

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

Abstract

Biodiesel has been attracting scientist for near about a century, and new revolutionary research and technical improvement had taken place in this field. But the basic problem of cost involved in using the biodiesel in engine in place of conventional diesel fuel is lying as such till date. In the present research work, it was tried to eliminate this problem by using non-edible oils with natural sourced catalyst optimizing certain set of parameters of best biodiesel performance. The biodiesel was produced from castor oil from highmadia and neem oil secured from S.K. Bioenergy Pune and Paritosh Herbs Ltd., Dehradun, Uttarakhand. A new method of preparation of nano-catalyst lithium doped CaO obtained from Murrh halid block

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Application of Machine Learning Technique for Demand Forecasting: A Case Study of the Manufacturing Industry

Anand Jayant Anshul Agarwal & Vaibhav Gupta

Conference paper | First Online 21 September 2020
624 Accesses | 1 Citations

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

Abstract

The objective of this work is to develop a machine learning-based Support Vector Machine (SVM) demand forecasting model and its application in supply chain management. The proposed SVM model will predict future demand with high accuracy as compared to the conventional forecasting methods. To demonstrate the effectiveness of the present model, demand forecasting accuracy is evaluated in a fictitious manufacturing industry as a case study.

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Modelling, Simulation and Optimization of Product Flow in a Multi-products Manufacturing Unit: A Case Study

Jarandhi Sharma & Anand Joshi

Conference paper | First Online: 09 April 2019
429 Accesses | 1 Citations

Part of the *Lecture Notes on Multidisciplinary Industrial Engineering* book series (LNM/LINEN)

Abstract

Simulation is a vital tool for validation of methods and architectures in the complex manufacturing environment before their application on shop floor for the production process. Manufacturing simulation, digital engineering tools and procedures have a positive impact on the manufacturing industry. Simulation models have been extensively used in manufacturing to enhance the design, planning and productivity of the processes. In manufacturing environment, crucial material movement, is controlled by various dynamic factors. Situations becomes cumbersome for assembling plants which deal with multi-product, owing to the dynamic factors. Analysing of these factors in real-life

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Decision Support Framework for Smart Implementation of Green Supply Chain Management Practices

Arvind Jayant & Neeru

Chapter | First Online: 22 August 2019

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Part of the [Studies in Big Data](#) book series (SRD; volume 64)

Abstract

Sustainability has become a critical issue for both society and businesses globally. With the increase of natural disasters and global issues such as water shortages, acid rain and climate change companies have started focusing on reducing their carbon footprint to ensure that the world's natural resources are sustained for the foreseeable future. Many international and local companies are now looking to incorporate green initiatives into their supply chain management. This has given rise to green supply chain management, which is the incorporation of sustainable initiatives into the supply chain of a company. Designing green supply chains (GSCs) requires complex decision support models that can deal with multiple dimensions of sustainability and specific characteristics of products and supply chain. Multi-

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Rajni Singh, Mukesh Kumar & Jagad Singh Ubhi

Conference paper | [First Online: 20 November 2018](#)

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Abstract

This paper presents a novel 9T SRAM (static random-access memory) cell design with reduced leakage power and high performance. The design makes use of a sleep transistor so as to curtail the leakage power by eliminating the formation of a direct connection between the supply voltage (V_{DD}) and ground. The results are compared with existing 9T SRAM cell with the same transistor sizing and parameter variations. The designed SRAM cell has decoupled read and write operations and is simulated using Cadence at 45 nm CMOS technology. At 0.8 V, the proposed cell has an improvement of 31.78% and 73.66% respectively in dynamic and static powers when compared with the reported 9T SRAM cell. Also, nearly 36% improvement in delay (D_P) is achieved with the proposed design.

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In this paper, a new technique of source biasing is proposed for leakage reduction in CMOS full adder (FA) circuit. It includes tail transistor between pull-down network and ground (GND). The source terminal of tail transistor is connected to GND during active mode and will be at V_{dd} in idle mode. High potential at source of tail transistor reduces the potential difference between source and drain of NMOS transistors which reduces gate leakage current. The proposed approach does not have the problem of ground bounce noise (GBN) during idle-to-active mode of transition. The proposed new technique is having reduction in leakage power up to 72% as compared to the existing FA circuit and peak power reduces up to 37% as compared to existing FA circuit while keeping other performance parameters in acceptable

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Mesothelioma, Sequential backward selection, mutual information, neighborhood

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Keywords: Kernel Mean Shift Real Time Tracking EDK FPGA Spartan6

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Dilbag Singh, Surinder Singh, Vishal Sharma, Sushbir Singh & Quang Minh Ngo

Optical and Quantum Electronics 51, Article number: 215 (2019) | [Cite this article](#)

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Abstract
This paper presents the design approach of all optical contention detection circuit based on the cross phase modulation interaction between two copropagating signal inside highly nonlinear fiber at the data rate of 120 Gbps. The error free operation has been achieved with the optimized signal power, length and effective area of optical fiber.

1 Introduction
With the advancement in high-speed communication network and material of nonlinear elements, the all-optical signal processing gets the great attention toward the area of research. It enables the implementation of all-optical signal processing devices which are integrable with the current established optical networks (Willner et al. 2014; Kurumida and Yoo 2012; Singh and Singh 2017a, b). The all-optical network can solve the problem of bottleneck in the current established networks caused by the conversions from optical-electrical-optical. The major signal processing operations in a network involve optical wavelength conversion, optical packet header processing, Contention detection, contention resolution or packet routing and

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Miniature Archimedean Spiral PIFA Antennas for Biomedical Implantable Devices

Publisher: IEEE | [Cite This](#) | [PDF](#)

Rajeev Kumar, Lakhvinder Singh Sodhi, Gurinder Singh | All Authors

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Abstract:
 In this present work, Miniature multilayer Archimedean spiral PIFA antennas for biological implantable devices is proposed. The antenna design is proposed to resonate at MICS (402-405MHz) and ISM Band (433-435MHz). The overall volume of design is less than 50 mm³. The present design is supposed to work inside human muscle tissue. Frequency dependent numerical homogeneous human muscle tissue model has been used for initial design. The design is simulated and validated by comparing the input from the different simulator HFSS based on Finite Element Method (FEM) and CST (innovative studio) suite based on Finite-Difference Time-Domain (FDTD) Method. The design is quite simple to achieve 70 real impedance matching by adjusting the feed and shuffling pie over spiral axis. Due to high impedance matching upto -40dB and -25dB of reflection coefficient (S₁₁) has been achieved for MICS band and ISM band design. Maximum achieved gain of proposed design is -30dB and -45.10dB respectively. The performance of the proposed antenna design is also analyzed inside the various human body tissue model.

Document Sections:
 I. Introduction
 II. Antenna Design & Fabrication
 III. Results & Discussion
 IV. Conclusion

Authors: Rajeev Kumar, Lakhvinder Singh Sodhi, Gurinder Singh

Published in: 2019 6th International Conference on Signal Processing and Integrated Networks (SPIN)

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INSPEC Accession Number: 18671982

Date Added to IEEE Xplore: 13 May 2019

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Abstract:
 In this paper, specific absorption rate (SAR) field of planar inverted F antenna (PIFA) inside the numerical homogeneous human muscle phantom model is investigated. Two antennas, miniature PIFA and wireless PIFA are compared and simulated to resonate at 2.4 GHz. The size of the proposed design is 25 x 22.4 mm on 20mil thick Rogers RT/duroid 5880 substrate. The proposed design claims ultra wide band property with more than 1.5 GHz bandwidth. The SAR value of different surrounding human tissue is obtained up to 20 mm away from antenna. The maximum average SAR value of antenna inside human muscle tissue is obtained to be 0.67W/kg and 3.1W/kg at 10mm distance from antenna plane. The design conveys quite good gain inside conducting lossy tissue comes to be -21.57 dB and -22.26dB.

Document Sections:
 I. Introduction
 II. Design & Fabrication
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 IV. Conclusion

Authors: Rajeev Kumar, Lakhvinder Singh Sodhi, Gurinder Singh

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Abstract

This paper presents a novel antenna structure for body diagnosis and detection system. The antenna structure is simple to fabricate and looks like a curved structure, which is easy to place on human body's curved parts. The proposed antenna consists of rectangular patch and rectangular fractal-based defected ground. The rectangular patch has one round cut at each corner. It is fed with coaxial cable and can easily be integrated with an array of multiple elements. The antenna parameters like, S_{11} , total gain, radiation pattern, polar pattern in various planes and VSWR were evaluated for various degrees of deformation of the planner patch antenna and are compared with the conventional planner antenna. The antenna retained its various parameters within permissible limits even after deformation. The proposed

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SURFACE PLASMON RESONANCE SENSOR BASED ON PHOTONIC CRYSTAL FIBER COATED WITH GOLD FILM

Cam Thi Hong Hoang¹, Minh Quang Ngo¹, Dai Van Pham², Son Thanh Pham², Vinod Kumar Verma³, Amit Kumar Shakya³, Veerpal Kaur⁴, Sukhbir Singh⁴, Surinder Singh⁴

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Abstract. In this paper, the high sensitivity surface plasmon resonance (SPR) sensor based on the photonic crystal fiber (PCF) with the gold-metal coating is proposed and numerically analyzed. The Finite Element (FE) based numerical technique has been used to solve the Maxwell equation with perfect matched boundary conditions. Sensing liquid filled into large size six air holes which are arranged in a hexagonal pattern. Among these six air holes, four air holes are coated with gold material to excite the plasmonic mode and light propagate inside the core region. By optimizing the structural parameters, the proposed design exhibits maximum wavelength sensitivity of 5000 nm/RIU with detection limit 1.34...

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UNEQUAL CLUSTERING ALGORITHMS IN WIRELESS SENSOR NETWORKS: A SURVEY

JATINDER PAL SINGH, ANUJ K. GUPTA and ANIL K. VERMA

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Authors: Jitendra Upadhyay, Anuj Bansal, Jagtar Singh
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Conference: AICHE Annual Meeting
Year: 2019
Proceeding: 2019 AICHE Annual Meeting
Group: Catalysis and Reaction Engineering Division
Session: Poster Session - Catalysis and Reaction Engineering (CRE) Division
Time: Wednesday, November 13, 2019, 3:30pm-5:00pm

Authors:
Prakash, N. - Presenter, Sani Longival Institute of Engineering & Technology (SLIET)

Single-site catalysts are revolutionizing polyolefin production because they enable more precise control of the polymer molecular architecture, which in turn controls the physical properties of the polymer. The benefit of metallocene catalysts is that they allow the production of tailored macromolecules, leading to new products such as *iso*- and syndiotactic polypropylene or syndiotactic polystyrene. The enormous structural variety possible in single-site catalysts gives rise to the need for a quantitative method to design a catalyst system to achieve a desired molecular architecture of the polymer. Mathematical modelling of the polymerization process is a crucial step towards developing such understanding and affords opportunities for optimization. It can not only explain the important phenomena during polymerization qualitatively, but also predict the relationships between operating conditions and polymer properties. Olefin polymerization kinetics have been investigated for a wide variety of homogeneous metallocene catalyst systems. Many experimental studies are focused on identifying the individual steps of the kinetic mechanism. However, only a few kinetic models have been validated using instantaneous reaction rate and molecular weight data.

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Proceeding: 2019 AIChE Annual Meeting
Group: Computing and Systems Technology Division
Session: Interactive Session: Systems and Process Operations
Time: Tuesday, November 12, 2019 - 3:30pm-5:00pm

Authors:
 Prakash, N. - Presenter, Sant Longowal Institute of Engineering & Technology (SLIET)

Abstract

Polypropene has demonstrated certain advantages in improved strength, stiffness and higher temperature capability over polyethylene and other terminal polyolefins.¹ Polypropene (PP) is a translucent commodity thermoplastic material with excellent physical and mechanical properties. PP is produced by polymerizing propene with suitable catalysts.

In the face of existing enormous market for polypropene the global polypropene market is expected to reach \$126.89 billion by 2026 growing at a CAGR of 6.4%, continuing holding a significant portion of the market share of the commodity thermoplastics globally.² Due to the predictable growth of consumption, there is a yearning to intensify the productivity and yield in existing processes to mollify its demand.

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(181ba) Analysis and Review of Micro and Nano-Structured Polymeric Materials

Conference: AIChE Annual Meeting
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Group: Materials Engineering and Sciences Division
Session: Poster Session: Materials Engineering & Sciences (58A - Polymers)
Time: Monday, November 11, 2019 - 3:30pm-5:00pm

Authors:
 Prakash, N. - Presenter, Sant Longowal Institute of Engineering & Technology (SLIET)

Conventional particulate polymer composites, often called filled polymers, are of noteworthy commercial importance as materials in industrial applications. Examples include talc-filled polypropylene for automotive applications, mineral-filled epoxies for electrical insulating applications and mineral-filled unsaturated polyesters for sanitary applications, also called cultured marble. Often the main function of the mineral filler is to reduce cost. Recently, a new approach has been investigated. Conventional composites are based on microscale reinforcement. However, dispersion of the inorganic filler at the nanometer scale has led to significant improvements in the properties of polymer nanocomposites. Polymer clay nanocomposites have received considerable attention since the polymer properties can be greatly improved by the presence of nanosized clay particles. Polymer-layered silicate (PLS) nanocomposites show high stiffness, strength and excellent barrier properties with far less filler content compared to conventional glass or mineral filled polymers. Lot of research work have been carried out in different polymer systems like epoxy, polybutaramide, polyimide, polyurethane and polypropylene. Only few studies have been reported based on clay @C unsaturated polyester systems. This study is focused on polyester-clay nanocomposites. Unsaturated polyester is a thermosetting polymeric material, widely used because of its good mechanical and

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Proceeding: 2019 AICHE Annual Meeting
Group: Engineering Sciences and Fundamentals
Type: Oral
Room: Orlando Ballroom I
Location: Hyatt Regency Orlando
Time: Monday, November 11, 2019 - 8:00am-10:30am

Chair(s):
 Kihelma, C., Clemson University

Co-chair(s):
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This session invites contributions that relate to the use of gas expanded liquids, near-critical, or supercritical fluids to produce materials with new or enhanced properties. This includes, but is not limited to, papers on formation of particles, films, coatings, and composite materials, using techniques such as rapid expansion, anti-solvent precipitation, fluidization, and dispersion and impregnation using supercritical fluids. Papers are encouraged that describe developments in experimental technique, developments in process characterization and instrumentation technologies, and advances in theoretical modeling and understanding of the processes.

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LNICST 115 - Real Time Object Tracking: Simulation and Imple... 1 / 10 100%

Real Time Object Tracking: Simulation and Implementation on FPGA Based Soft Processor

Manoj Pandey¹, Dorothei Borgohain², Gargi Baruah³, J.S. Ubhi¹, and Kota Solomon Raju¹

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Abstract. Adaptive systems are being easy to design using reconfiguration facility on Field programmable gate arrays (FPGAs). In this paper, Kernel based Mean shift algorithm is used for tracking a moving object. First it is simulated on Matlab and then implemented on microblaze soft processor based FPGA board. Tracking is observed for two similar objects crossing each other moving with uniform speed in a stored video as well as real time video. Object tracking, when it comes to implement on pure software (SW) in real time becomes difficult task due to certain limitations of SW. This paper shows how the mean shift algorithm is implemented on Xilinx Spartan 6 FPGA board using EDK. Once the complete algorithm is implemented on microblaze soft processor then some of the mathematical functions of algorithm are calculated on hardware to use HW-SW co-designing methodology to enhance the performance of the system.

Keywords Kernel, Mean Shift, Real Time Tracking, EDK, FPGA, Spartan.

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A Robust Hybrid Multi-criteria Decision-Making Approach for Selection of Third-Party Reverse Logistics Service Provider

Avinash Jayant | Shreeta Singh & Tanmay Walke

Conference paper | [First Online: 21 September 2020](#)

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

Abstract

Environmental awareness has universally driven the move for sustainable supply chain management. Accordingly, manufacturing companies or organizations try to seek sustainable business strategies to respond to market pressure toward corporate social responsibility (CSR). Sustainable reverse logistics and provider selection is one of the practical strategies for ...

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Low-Carbon Supply Chain Management: A Fuzzy-DEMATEL Analysis of Some Practical Issues of Indian Manufacturing Industries

Vivek Gupta & Arvind Jayant

Conference paper | **First Online:** 23 December 2020

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

Abstract

Carbon removal is a major task for environmentalists, because of its deep effect on human. Some problems such as inventory control, automatic e-supply chain and customer-consumer interaction techniques are used in machinery and method of apply. To minimize these issues, some hypothesis has been given. These hypothesis are totally based on questionnaires getting from relevant industries. It is observed that there is a big difference between the on paper applied procedure by the top administrative level and the procedure actually applied in the industries. A fuzzy-applied DEMATEL phenomenon is adopted for the recognition of the relationship and importance of different elements actually applied in this paper. The results

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Manufacturing Engineering pp 65-73 | Cite this

Design and Development of High-Velocity Submerged Water Jet Cavitation Erosion Test Rig

Anuj Bansal Jonny Singla Shivam Pandey Pram Raj

Conference paper | First Online: 03 June 2020
 492 Accesses | 1 Citations

Part of the [Lecture Notes on Multidisciplinary Industrial Engineering](#) book series (LNMUINEK)

Abstract

Several hydro-machinery components such as impellers of submersible pump, draft tubes and turbine blades generally suffer from cavitation erosion (CE) during their operation, and due to this, service life and capability of such parts are reduced. During the design and development of these components, test rigs are usually required to evaluate their performance. In the present research work, keeping in view the economic aspects, out of different test rigs available, it is proposed to use high-velocity submerged water jet cavitation erosion test rig. The test rig was designed with flexibility in cavitation erosion parameters (velocity, angle of attack, stand-off distance, nozzle diameter) and fabricated with an aim to test the cavitation erosion of hydro-machinery steel under different cavitation erosion parameters. Calibration of

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Thermomechanical Analysis of Al-7075 to Predict Residual Stresses by Using 3D Finite Element Simulation

Ankit Saxena & Ravindra K. Saxena

Conference paper | First Online: 17 January 2023

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

Abstract

Newer research and simulation tools are one of the advances in alloy manufacturing which allows prediction of final microstructure, residual stresses, and fatigue behavior before actual processing. Experimental procedures of measuring residual stresses using latest technology such as neutron X-ray diffraction techniques, ultrasonic technique, are tedious and expensive. In this paper, an approach is presented to predict residual stress behavior for block of different size as well as shape under thermomechanical loading for Al-7075 alloy block. Computer simulation was used as a tool in order to perform above task. Patran™ and Nastran™ finite element software was used. The predicted residual stresses are compared with experimental

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Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410

Amrinder Singh, Anil Bansal, Jagtar Singh & Anil Kumar Singla

Conference paper | First Online: 03 June 2020

470 Accesses | 1 Citations

Part of the Lecture Notes on Multidisciplinary Industrial Engineering book series (LNMUINEK)

Abstract

Martensitic grade SS410 is used extensively for manufacturing of turbine blades and other hydro-machinery components. During working of such components, due to poor mechanical properties of the material, the components lose its functionality and life of such components decreases. In this regard, the improvement in the material properties is essential to enhance the life of such components. For improving the mechanical and metallurgical properties of the material, deep cryogenic treatment (DCT) can be effectively used. In this research work, DCT followed by tempering at two temperatures 350 and 250 °C has been performed on SS410. The SS410 specimens with and without DCT were tested for tensile strength, toughness, and micro-hardness. It has been observed that DCT followed by post-tempering at 250 °C has

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Abstract

Several hydro-machinery components such as impellers of submersible pump, draft tubes and turbine blades generally suffer from cavitation erosion (CE) during their operation, and due to this, service life and capability of such parts are reduced. During the design and development of these components, test rigs are usually required to evaluate their performance. In the present research work, keeping in view the economic aspects, out of different test rigs available, it is proposed to use high-velocity, submerged water jet cavitation erosion test rig. The test rig was designed with flexibility in cavitation erosion parameters (velocity, angle of attack, stand-off distance, nozzle diameter) and fabricated with an aim to test the cavitation erosion of hydro-machinery steel under different cavitation erosion parameters. Calibration of the test rig was done for jet velocity, stand-off distance (SOD) and angle of attack. The CE rate of steel SS410 was evaluated using the fabricated test rig under different operating parameters consists of 3 velocities and 3 stand-off distance, keeping the other parameters like angle of attack as 90° and nozzle diameter as 3 mm. The test rig was capable of producing CE as observed from the specimen microstructure. From the microstructure analysis, the pits produced during the CE are clearly visible. The CE rate was found to be maximum for a parametric combination consist of maximum velocity (35 m/sec) and stand-off distance (10 cm). With an increase in velocity, the amount of water bubbles increases in the cavitation cloud, which contributes to maximum erosion. The cavitation erosion rate is enhanced by increasing the stand-off distance from 5 cm to 10 cm, followed by a downturn when moving

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Abstract

Recent research and simulation tools are one of the advances in alloy manufacturing which allows prediction of final microstructures, residual stresses, and fatigue behavior before actual processing. Experimental procedures of measuring residual stresses using latest technology such as neutron X-ray diffraction techniques, ultrasonic techniques, are tedious and expensive. In this paper, an approach is presented to predict residual stress behavior for block of different size as well as shape under thermomechanical loading for Al-7075 alloy block. Computer simulation was used as a tool in order to perform above task. Patran™ and Nastran™ finite element software was used. The predicted residual stresses are compared with experimental and simulated measurements. Outcomes signify that predicted values are in good accord with experimental and simulated measurements. It is found that material is experiencing compressive residual stresses at the surface and tensile residual stresses in the core due to thermal cycles and edge effect.

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Arvind Singh | Ajay Singh | Jyoti Sharma | Jai Kumar Singh

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Abstract

Martensitic grade SS410 is used extensively for manufacturing of turbine blades and other hydro-machinery components. During working of such components, due to poor mechanical properties of the material, the components lose its functionality and life of such components decreases. In this regard, the improvement in the material properties is essential, to enhance the life of such components. For improving the mechanical and metallurgical properties of the material, deep cryogenic treatment (DCT) can be effectively used. In this research work, DCT followed by tempering at two temperatures, 350 and 250 °C has been performed on SS410. The SS410 specimens with and without DCT were tested for tensile strength, toughness, and micro-hardness. It has been observed that DCT followed by post-tempering at 250 °C has shown better results in terms of ultimate tensile strength (UTS) and micro-hardness as compared to its counterparts. This may correspond to the conversion of retained austenite to martensite and formation of fine secondary carbides.

Keywords

Deep cryogenic treatment | Tempering | SS410 | Martensite

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Abstract
 Membrane separation processes are emerging as one of the best technologies for desalination of brackish and seawater, production of potable water, and wastewater treatment. The advantages of the process include high removal capacity, selectivity, compactness of the instrument, and low cost. Although the process offers easy separation at a low energy cost, one of the main impediments for its commercialization is decline in operational efficiency with time due to membrane fouling. Membrane fouling not only alters the quality and quantity of the resulting product but also compromises the life of the membrane. The membrane fouling results from the deposition of

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 The aim of this paper is to analyze the effect of circular microstrip patch antenna over the human head and perform comparative study with the rectangular microstrip antenna by estimating specific absorption rate (SAR) and temperature distribution. Human head is the most sensitive area for radiations coming from the mobile phone. So the exposure of the biological tissue to the electromagnetic radiation (EM) should be within permissible limits as per the defined standards. Results show that the SAR value of circular patch antenna has been reduced to 0.15 W/kg and temperature distribution is lowered down to 6.3°C at a frequency of 900 MHz as compared to the values for rectangular microstrip patch antenna which are otherwise within specified limits. The numerical simulation has been performed using finite element based COMSOL Multiphysics software.

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1. Introduction
 In the modern era of communication, with the extensive usage of electronic equipment, the amount of radiation energy in which human bodies are exposed has also increased. In order to reduce the SAR, the SAR is used to compare the SAR values and reduce the SAR.

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In this paper, XOR gate is implemented based on nonlinear polarization rotation, initiated by Kerr effect in a single highly nonlinear fiber (HNLF) having length of 5 km and bit rate of 20 Gbps. Two cross-polarized inputs and polarization controller are used to control the Azimuth and ellipticity angle for the different input powers. Quality factor is analyzed versus different input power, extinction ratio, Azimuth, and ellipticity angle over various lengths of an optical fiber. Erbium-doped fiber amplifier (EDFA) is used for its nonlinear property and fast response time for the generation of XOR logic output.

Keywords

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Abstract

The welded joint is susceptible to failure due to the presence of entrapped residual stresses. Welded joint is subjected to high intensity of concentrated heat moving at defined speed along a path. The material is subject to transient temperature variations. The transient temperature variations give rise to uneven heating and subsequent cooling. The material experienced an uneven tensile and compressive residual stresses under those changing temperature conditions. The situation becomes trivial under multi-pass welding. In the present work finite element method is employed to calculate the temperature distribution, heat affected zone and resulting residual stresses during MMAW welding. Element birth and death technique is apply to simulate the flux deposition. The results on temperature distribution are in reasonably good validated with the experimental results. It is observed that there is relative increase in the magnitude of residual stresses with the similar relative increase in temperature.

Keywords

Residual stresses | V-butt weld | AISI-304 stainless steel | Finite element analysis | MMAW

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UNEQUAL CLUSTERING ALGORITHMS IN WIRELESS SENSOR NETWORKS: A SURVEY

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Abstract

Internet of Things (IoT) is about connecting and communicating between sensors and Wireless sensor network (WSN) being the most appropriate network of sensors nodes plays an important role in IoT. But due to battery drainage issues of the sensor nodes WSN has limited network lifetime. An efficient way to extend the network lifetime of WSN is clustering i.e. to group the sensor nodes of the entire network into number of clusters, but it gives birth to hot-spot problem. Unequal clustering is the best solution to overcome such problems, in which sensor nodes are grouped into clusters of unequal sizes and the size varies according to the cluster head (CH) distance from the base station (BS). In this paper an attempt has been made to compare different unequal clustering algorithms highlighting their various features and objectives.

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Summary

This chapter provides comprehensive information on different aspects of characteristics of food waste, its supply chain and recovery of valuable products from anaerobic digestion of food waste, and novel approaches for the transformation of food waste into valuable products through chemical and biotechnological routes. Food waste is generated throughout the food supply chain and is produced when the desired product is separated from undesirable product. Anaerobic digestion is an efficient and vital technology used globally for the proper disposal and treatment of food waste. This technology has proven to be a promising and environmentally friendly approach for the management of food waste as well as the production of a variety of valuable products including biogas and digestate. The chapter describes the biotechnological and chemical transformations used for the production of various high-value products from food waste. It also provides a case study of production of methane via anaerobic digestion of food waste.

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Hydrogen sensing properties of Palladium thin films and nanoparticles

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ABSTRACT

Hydrogen sensing curves of Palladium thin film and nanoparticles layers during a complete loading and unloading cycle have been investigated. The curves shows increase in resistance during loading and decrease in resistance during unloading as expected in the case of thin film sample. The value of resistance first increases and then slowly decreases in case of nanoparticles layer sample during hydrogen loading. The increase in resistance is due to the electronic effect (EE) and decrease in resistance is due to geometric effect (GE). This characteristic behavior of nanoparticles is reported as pulse like nature. The result shows that nanoparticles layers show better response towards hydrogen sensing than thin film.

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Smart healthcare using Wireless Sensor Networks: A review

Amandeep Kumar¹, Babinder Singh Dhakwa², Damrajpreet Singh³

¹Research Scholar, CDE, AMUPTT, Ludhiana
²Assistant Professor, CDE, AMUPTT, Ludhiana
³Professor, CDE, AMUPTT, Ludhiana

Abstract:
Rapid growth of population and aging are facing a rise in healthcare services. Healthcare system provide more monitoring even without hospitalization. The advancement in the area of Wireless sensor networks and wearable body sensors make it possible to develop efficient and smart healthcare system. Wearable body sensors detect anomalies and inform clinicians that can help to provide necessary help. The paper reviews wireless sensor networks for health monitoring system and wearable body sensor.

Keywords: Wireless Sensor Networks (WSN), Wearable Body Sensor (WBS), Healthcare, Smart Sensors.

1. INTRODUCTION
Owing to the elderly population is increasing and getting older that rise in healthcare cost. With the advancement in healthcare perspective to change quality of life is continuing to increase. Today, worldwide, over 850 million people suffer from chronic diseases and facing many health problems [1]. So it is better to be periodically monitored for prevention of disease and early detection of emergency conditions. Smart Health care system provide monitoring even without hospitalization. The advancement of research in the area of WSN has opened the innovative possibilities by measuring physical quantities in disease management, rehabilitation, industry, medicine, care of dependent people and healthcare management. Medical and WSN research have solved number of diagnosis challenges that we face in daily life. Healthcare monitoring being one of them [2].

A WSN comprises of numerous sensor nodes placed on specific area, which organized into a computerized network that can able to communicate, compute and control. They are preparation are named by WBS devices and form Body Area Network(BAN). Wireless Body Area Network (WBAN) is special purpose WSN that integrates WBAN and various networks to facilitate remote-patient monitoring [3].

Researchers in WSN and health area are continuously work collectively to deliver an intelligent and efficient smart healthcare monitoring. WSN provide various services in healthcare for people with various physical and mental disabilities by monitoring their posture (posture[4]), Human physiological activities observed are: ambient, heart rate, body temperature, blood pressure, muscle movement and other various data. It is become possible with WSN to have necessary monitoring of heart (ECG) during the recovery time. The WSN can provide necessary and real-time feedback. The monitored activity has studied by doctors, physicians and

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A Comprehensive Study for Energy-Conservation in Wireless Sensor-Network using Optimization Algorithms

Preeti¹, Ranjit Kaur², Damrajpreet Singh³

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³Computer Science & Engineering Department, Guru Nanak Dev Engineering College, Patiala, India

ABSTRACT
Wireless sensor network (WSN) is network of sensors with the function to sense, operate and exchange data. WSNs have progressively used up in various applications areas including engineering to health monitoring. Energy-efficient and low cost WSN depends on the parameters such as network-topology, packet delivery-rates, and device data aggregation. The topology suitable energy at minimal quality of service (energy-consumption is the main issue which is to be considered for enhancing the performance of WSN and can be minimized effectively by involving the communication nodes in off states network or network. In this paper various energy saving conservation algorithms for WSN using optimization algorithms have been studied and analyzed for accurate monitoring of WSN. The investigation provide more information for designing an energy efficient, reliable and robust WSN protocol to guarantee proper communication among the network.

Keywords: Wireless sensor-network, Optimization, Clustering, Cluster-based, Energy conservation.

1. INTRODUCTION
WSN is autonomous network that comprises of communicating sensors. The packet communication is done by these sensors nodes among themselves their communication range. Moreover they are well equipped to sense the data, observe, and identify the physical-property of the actual environmental conditions. Recently, WSN has increased attention among users and researchers as a dominant technological platform with remarkable applications. This has been a significant research area in understanding many applications including of health/fitness/monitoring systems and implemented for life-threatening applications such as animal localization, surveillance services and atmospheric monitoring systems [1]. WSN has data compression power, memory resources and battery back-up, so maintaining the network lifetime, energy conservation is essential reasons for enhancing the network performance. Any WSN is serving its goal only if it is alive. Therefore, the network lifetime is a necessary parameter for the adequate tracking of WSN and can be extended by judiciously applying various energy efficient techniques. Another challenge is optimization of the energy consumption which can make the wireless communication system perform better. So, conservation and optimization of energy in the recent research area will need engines for better performance evaluation of WSN [2]. In this research paper, various existing energy optimization Algorithms are evaluated in WSN. The Efficient algorithms are examined with comparison is presented, in the section II, the

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Application of Crop-residue Biomass as a Catalyst for Bio-diesel Production from Waste Cooking Oil

Proceedings of the International Conference on Advances in Chemical Engineering (ACEE) 2020

30 Pages • Posted: 1 Oct 2020

Parthiv Jha
Sri Sargam Institute of Engineering & Technology
Ankur Sontakke
Sri Sargam Institute of Engineering & Technology
Over 10 years February 1, 2020

Abstract
To produce biodiesel environmentally, one should select an appropriate feedstock and catalyst. Waste cooking oil is available after frying various types of food items in India. Collection required to be heterogeneous. India produces a great number of crop residue every year. They need to be utilized to avoid disposal issues. The crop residue, coconut oil is available from food processing industries, especially in the coastal regions of India. It is the source of carbon. So, it was selected as a catalyst. The reaction was catalyzed by H_2O_2 , followed by sulphuric acid. The resulting catalyst was used to produce biodiesel using waste cooking oil. The formation of biodiesel was studied using alcohol to oil ratio (O:O), time of reaction, reaction temperature, and catalyst loading. In the optimal condition of these parameters, biodiesel yield was maximum 95%. The biodiesel that synthesized was characterized in terms of fuel properties, namely, calorific value, fuel ratio, density, viscosity, acid value, cloud point, pour point, and flame number. These values were compared with the standard ones.

Keywords: Biodiesel, coconut oil, ethanol, sulfuric acid, esterification, FTIR, conversion

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Performance Evaluation of Clustering Techniques in Wireless Sensor Networks

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Howell, Rajat Kumar, Damayanti Singh, All Authors

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Abstract
Clustering is one of the essential techniques in wireless sensor network (WSN). Clustering is done to achieve the energy efficiency, improve network lifetime and the scalability of the network. The sensor nodes (SNs) in the network are arranged into various small clusters and each cluster is assigned with a cluster head (CH). Cluster formation is mandatory objective for maintaining the network lifetime to conserve energy. In this work, the problem of clustering is formulated in accordance with dissimilarity factor. The network nodes are deployed and clusters are formed randomly for a large area network. The selection of CHs done dynamically on the basis of residual maximum energy and performance is optimized on the basis of energy consumption. In this paper clustering techniques such as Mean-shift, Fuzzy C Mean (FCM), K-mean (KMEAN) and Hierarchical clustering (HC) are simulated and the results are compared on the base of dissimilarity factor. HC is showing better results in comparison to the other clustering algorithms. The performance comparison of various clustering techniques is used to find a better formation algorithm for WSN. Better clustering with the proposed HC algorithm will provide better communication in a cost-effective manner.

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Chapter 30 Phenolic nanoconjugates and its application in food

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Abstract

Phenolic compounds are very well known due to their various health promoting properties such as antioxidant, antibacterial, anti-inflammatory etc. However, the unstable nature of pure phenolic compounds limits their use in the food industry. Phenolic conjugation with nanoparticles has been developed either by covalent or non-covalent method using polysaccharides, proteins and metal nanoparticles. The nanoconjugates can be designed to have desired physico-chemical attributes and functional properties that are different from the pure natural materials. Nanoconjugation improves the physical and chemical stabilities and controlled release properties and could be used to develop novel functional food and packaging system. Food researchers must involve in-vivo toxicity or clinical studies before such product and process are released for commercial purposes. Present chapter is an attempt to provide reader broad base information on the mechanism of synthesis, structure, functional properties, in-vitro, in-vivo study on bioaccessibility and bioavailability of phenolic nanoconjugates in human gastro intestinal systems. A brief review on

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Abstract

The aim of the present work was to study the role of Ti additions made to Nb containing stabilized austenitic stainless steel grade AISI 317 welds for improving their metallurgical stability and pitting corrosion resistance. For achieving this, gas tungsten arc welding process (GTAW) was used to fabricate multi-pass and multi-layer weld pads comprising of 28 weld passes and using AISI 317 (Nb based) and AISI 321 (Ti based) solid fillers in a systematic combination so as to obtain different weld metal surfaces with varying Ti/Nb ratios of 0.45, 0.66, and 1.57. These surfaces were examined for their pitting behavior using electrochemical method, an electron probe microanalyzer (EPMA) equipped with a wavelength dispersive X-ray spectrometer (WDS) for chemical composition analysis and X-ray photoelectron spectroscopy (XPS) depth profiling of passive films. Austenitic stainless steel welds with Ti/Nb ratio of 0.45 exhibited maximum pitting potential of 3805 mV_{SCE} as compared to sole Nb weld with 270.7 mV_{SCE}. The atomic concentration profiles of oxygen across different weld surfaces indicate that estimated passive film thickness values for sole Nb (317 weld metal) and Nb weld stabilized with Ti/Nb ratio of 0.45 were calculate to be 0.43 nm and 7.11 nm, respectively. Ti addition suppressed the carbide formation tendencies resulting in higher levels of Ni in the matrix as well as different dendritic regions of 317 weld metal. Thus, this study establishes that Ti additions of 0.21 wt% in Nb weld can significantly enhance its pitting resistance.

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Nanocellulose Biocomposites for Bone Tissue Engineering

Alexandra Singh | Anindita Sanyal | A Pallab Kumar

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Abstract

Nanotechnology and nano-engineering stand to produce significant scientific and technological advances in diverse fields including medicine and physiology. Nanocellulose being a lightweight, transparent, biocompatibility, abundant, eco-friendly, and sustainable natural biopolymer has attracted more and more interest in biomedical field for advanced medical diagnosis, especially for bone tissue engineering (BTE). Various nanoforms of cellulose are used to reinforce natural as well as synthetic clinically relevant polymers. Nanocellulose-reinforced polymer nanocomposites (PNCs) demonstrate an improvement in mechanical, barrier, and thermal properties. The addition of compatibilizer as a coupling agent promotes a fine dispersion of nanocelluloses in polymer. A PNC for BTE owns a polymer matrix with bioactive and well resorbable nanosized fillers. However, a solid material is not able to mimic the structure, composition, properties and other characteristics of natural bone; therefore, the PNCs are the best alternatives for bone cell regeneration. A PNC furnishes a suitable polymer matrix, cancer worthy biological attributes, able to control tuning of release of target-based migrants, and also feasible to integrate sensor-based serial migration of multiple entities required at various stages of bone cells regeneration. Hence, a PNC is regarded as an intelligent nanocomposite biomaterial. The chief function of a PNC used for BTE is to corroborate the process of bone cell regeneration at desired target followed by in situ degradation, and then an eventual supersede by newly profused bone cells. Nevertheless, toxicity, safety standards, and challenges are also associated as usual, and they are well addressed in this chapter. Nanocellulose-based PNCs offer some important advantages over conventional synthetic materials and show great promise to advance the frontier of scientific knowledge. In this chapter, recent advances in nanocellulose incorporated PNCs based biomaterials in the context of bottom-up approaches for BTE are summarized.

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Nanotechnology Nanofibers Biodegradation Polymer scaffold

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[Amarendra Singh, C. Gunjan & P.P. Kunda](#)

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Abstract

Nanotechnology has a vital role in the advancement of almost all the fields of research. This chapter summarizes the recently developed polyurethane (PU)-based nanomaterials for bone tissue engineering (BTE) purpose. The PU matrix when embedded with nano identifies it becomes a versatile material and able to serve various applications. The end use of PU-based nanocomposites (PUNCs) is tuned by choosing an appropriate polyurethane, nano identifies and their composition ratio. A PUNC for BTE owns a polymer matrix with bioactive and well-resorbable nano-sized fillers. However, a sole material is not able to mimic the structure, composition, properties, and other characteristics of the natural bone; therefore, the PUNCs are the closest alternatives for the bone cells regeneration. A PUNC furnishes a suitable polymer matrix, carries worthy biological attributes, able to control the tuning of release of target-based migrants, and also feasible to integrate the sensor-based serial migration of multiple entities required at various stages of bone cells regeneration. Hence, PUNCs are regarded as intelligent nanocomposite biomaterials. The chief function of such material to be favorable for BTE is to corroborate the process of bone cells regeneration at the desired target followed by its degradation, and then an essential supersede by newly produced bone cells. Nevertheless, the toxicity, safety standards, and challenges are also associated as usual, and they are well addressed in this chapter.

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Jagdeep Singh, Sourbh Thakur, Rakesh Sehgal, A.S. Dhaliwal & Vijay Kumar

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Abstract

Nanofibers (NFs) are fibers with diameters in the nanometer range and have found numerous applications due to their unique properties. Researchers are still trying to improve the properties of electrospun-based fibers by using unique nanomaterials for solving environmental problems especially the treatment of wastewater. The modification of NFs has been carried out by decorating and embedding the various types of nanoparticles, such as noble metals, carbon nanomaterials and metal oxide nanoparticles onto the surface of the membrane. The decorated surface of the NFs membrane possesses high surface area, surface energy, additional functionality, and anti-fouling properties that make them a suitable candidate for wastewater treatment application. This chapter highlights the modern trends in the surface engineering of NFs via electrospinning embedded nanoparticles (NPs) for wastewater treatment. The shape and size of Ag and Au NPs prepared under different reducing and stabilizing agents are also reviewed. The electrospun polymer NFs embedded with different NPs and surface modifications of NF membranes are discussed. The critical issues related to the use of electrospun polymer NFs embedded with different NPs for wastewater treatment along with a concluding note on possible future directions on this have

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Structural and surface morphological studies of WSe_2 2-D material

AIP Conference Proceedings 2352, 020065 (2023). <https://doi.org/10.1063/5.0052724>

Kiran Bera¹, Pratik Kumar^{1,2} and A. S. Ghoshal^{1,2}

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ABSTRACT

2D materials show fascinating properties for their applications in advanced technology. Tungsten Ditelluride (WSe_2), a family of transition-metal dichalcogenides, has greatly inspired researchers to take up challenges in energy storage, optoelectronic and electronic applications. We have synthesized WSe_2 using hydrothermal technique via the reaction of sodium tungstate and selenium powder with the assistance of sodium borohydride, a reducing agent and N, N-dimethylformamide (DMF) and deionized water have been utilized as double solvent. The structural and the surface morphological properties of WSe_2 have been studied using X-ray diffraction and Field Emission Scanning Electron Microscope (FESEM) which approve the high crystallinity and reveal the most thermodynamically stable Hexagonal phase of WSe_2 . The successful synthesis of this new class of 2D material motivated us to perform ion beam bombardment experiments for modifying its properties especially for energy applications.

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Dr. Manojvel Singh is working as a Professor/OD in the School of Mechanical Engineering, Lovely Professional University, Jalandhar. He obtained his B. E. Mechanical from College of Engineering and Technology, Baddi from Govt. Zila Singh College of Engineering and Technology, Bathinda in 1999, M.Tech (Manufacturing and System Engineering) from Jangam Regional Institute of Engineering and Technology, Jalandhar (affiliated from Punjab Technical University, Jalandhar) in 2001, and Ph.D from the Jangam Regional Institute of Engineering and Technology, Jalandhar (Deemed University) in 2013. He has published more than 40 research articles in international journals, conferences of high repute. He has guided 6 M.Tech and 1 Ph.D thesis and 2 candidates are pursuing Ph.D with him presently. He has also published 13 patents. His academic life includes serving as a peer reviewer in journals and conducting a number of training programs. His areas of interest include design for vibration systems, modal analysis, condition monitoring, fault diagnosis, reliability analysis and green buildings. He has organized three international conferences at various institutes as organizing secretary and convener.

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Fabrication and characterization of TiO₂ based dye-sensitized solar cell

AIP Conference Proceedings 2352, 020043 (2021) <https://doi.org/10.1063/5.0052483>

Mansy Kurnia¹, Aket Kurnia¹, Sachris Kurnia¹, and A. S. Djalil¹

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ABSTRACT

Dye-Sensitized Solar Cells (DSSCs) are the promising low-cost solar cells to convert solar energy into electric energy. In this study, TiO₂ based Dye-Sensitized Solar Cell is fabricated. TiO₂ paste is prepared by using ethanol as a solvent. A thin layer of TiO₂ paste is coated on ITO conducting glass, which acts as a working electrode. The counter electrode is prepared by pencil graphite paste using ethanol as a solvent and coated on ITO conducting glass. The dye solution is prepared by adding commercially available methylene blue dye to ethanol and deionized water. From XRD studies, the average crystallite size of TiO₂ powder is found to be 88.46 nm. This indicates that the nanostructure of the TiO₂ having a large surface to volume ratio playing a vital role in the absorption of solar radiations by the material. J-V characteristics of fabricated DSSC were studied to evaluate its performance in terms of a short circuit current, open-circuit voltage, and fill factor. The performance of DSSC may be enhanced by decreasing the crystallite size of TiO₂.

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RESEARCH - PUBLISHED ONLINE 19 AUGUST 2022

Effects of target thickness on the shape of the bremsstrahlung energy spectrum of Pb in the photon energy region of 1-100 keV

AIP Conference Proceedings 2352, 050020 (2021) <https://doi.org/10.1063/5.0052341>

Amit Singh¹ and A. S. Djalil¹

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ABSTRACT

The effects of target thickness on the shape of the bremsstrahlung energy spectrum in Pb for ²¹⁰Pb beta particles are studied in the photon energy region of 1-100 keV. The thicknesses of the Pb targets chosen for present study are 53, 223, 550, 677, 908 and 1352 mg/cm². The bremsstrahlung energy spectrum, only at target thickness of 677 mg/cm² is found to be closer to the Amdurina and Prati (1989) theory for total bremsstrahlung with the variation of +3%, -2%, -2%, -12%, -39% and 69% at 1, 4, 10, 30, 60 and 100 keV, respectively. The polarization bremsstrahlung is limited up to a particular target thickness at low-energy region, suppressing the bremsstrahlung at high-energy region.

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Synthesis and rietveld refinement study of calcium doped zirconia

AIP Conference Proceedings 2352, 020042 (2022), <https://doi.org/10.1063/5.0052559>

Ankit Kumar¹, Pravin Kumar², and A. S. Dhallwal¹

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ABSTRACT

Zirconia (ZrO₂) has a unique property of changing the crystalline phase from monoclinic to cubic at a higher temperature. This leads to its versatile applications in the fields of nuclear reactors, oxygen detectors, solid oxide fuel cells etc. Ytria doped zirconia has been studied extensively for transformation and stabilization of its cubic phase at room temperature. Whereas, the reports on such accounts with calcium doping are rare. In present study, the crystalline structure of Ca-doped zirconia (8 mol % Ca) as prepared by the solid-state reaction technique and sintered at 1000 °C in air, is compared with that of pure zirconia. From the X-ray diffractometer patterns recorded in θ - 2θ geometry, it is evident that the pure zirconia exists only in the monoclinic phase. Further, the XRD of Ca-doped zirconia and its Rietveld refinement revealed the stabilization of zirconia in the monoclinic and cubic phase. The cubic phase stabilization in zirconia at room temperature with calcium doping opened up the possibilities of tailoring its properties more precisely via ion implantation.

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Structural studies of zirconia and yttria doped zirconia for analysing it phase stabilization criteria

Ankit Kumar¹, Pravin Kumar² and A S Dhallwal¹

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Investigation of gamma ray and fast neutron shielding ability of some waste glasses for nuclear waste storage facilities

AIP Conference Proceedings 2352, 050033 (2021) <https://doi.org/10.1063/5.0052727>

Balraj Singh Sahu¹*, A. S. Dhalwal², and K. S. Habbal³

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ABSTRACT

In present communication, gamma and neutron shielding ability of CRT panel (CRT-P), CRT faunel (CRT-F), LCD, and commercial borosilicate (BS) waste glasses has been studied in terms of energy exposure build up factors and fast neutron removal cross-section. The energy exposure build up factors of aforesaid waste glasses for the energy range of 0.015 MeV to 15 MeV and for penetration depth upto 40 cm have been calculated directly using simple Log Interpolation Method without using multistep G-P fitting method. On the basis of obtained results, it has been reported that these waste glasses possess satisfactory shielding characteristics and can be used as aggregate for making high density concrete storage facilities for safe disposal of nuclear waste.

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Outline

Abstract

Keywords

1.1. Introduction

1.2. General synthetic methods in green chemistry

1.3. Green solvents in synthetic methods

1.4. Conclusions

Acknowledgments

References

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Figures (6)

Handbook of Greener Synthesis of Nanomaterials and Compounds
Volume 1: Fundamental Principles and Methods
2021, Pages 1-34

Chapter 1 - The Fundamental perspectives of greener synthesis

Balraj Singh¹*, Idharajesh Kumar², Anupama Prasad³, Harish Kumar Chandra⁴, A.

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Abstract

The use of green chemistry principles and sustainable technologies is the need of the hour for pharmaceuticals, food, textile, and fine chemical industries because of stringent regulations from the governments and environment agencies. The green chemistry, a set of 12 basic rules, basically refers to plan the synthetic strategies in such a way that there should be minimum influence on the environment and human health. For this, the atom and energy economical synthetic processes are being appreciated. Also, the environmentally harmful volatile organic solvents are being replaced with relatively greener substitutes. In this context, the use of greener solvents is receiving much attention from the scientific community. In present, the ionic liquids and supercritical

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Machine Learning Techniques for Underwater Wireless Sensor Networks: A Comprehensive Study

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Abstract

With the enormous growth of sensor networks, information seeking from such networks has become an invaluable source of knowledge for various organizations to enhance the comprehension of people interests. Not only wireless sensor networks (WSNs) but its various classes also remain the hot topics of research. In this chapter, the primary focus is to understand the concept of sensor network in underwater scenario. Various mechanisms are used to recognize the activities underwater using sensor which examines the real-time events. With these features, a few challenges are also associated with sensor networks, which are addressed here. Machine learning (ML) techniques are the perfect key of success to resolve such issues due to their feasibility and adaption in complex problem environment. Therefore, various ML techniques have been explained to enhance the operational performance of WSNs, especially in underwater WSNs (UWSNs). The main objective of this chapter is to understand the concepts of UWSNs and role of ML to address the

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Steganography and its Advancements in Spatial Domain

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AI-Based Approach for Person Identification Using ECG Biometric

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ABSTRACT

In recent years bioelectric signals like electrocardiogram, electroencephalogram, and photoplethysmogram based person authentication has received tremendous attention of the biometric community. This is due to

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The Role of Infrared Thermal Imaging in Road Patrolling Using Unmanned Aerial Vehicles

Amit Kaul, A.S. Arora, Sushil Chauhan

Chapter | First Online: 10 November 2022
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Abstract

In the past few years, the tremendous growth in road network and vehicles has increased the road fatalities at a very alarming rate. Road patrolling is one of the prominent measures to reduce road fatalities. Generally, road patrolling has been done using manned ground vehicles whose performance is highly dependent on environmental conditions. With this in mind, an infrared (IR) thermal imaging-based technique to enhance the object's detection in poor weather conditions is presented in this study. Moreover, it can be employed in unmanned aerial vehicles (UAV) for road patrolling in unfavorable weather conditions including total darkness, fog, and heavy rain. The aim of this study is to automate the process of object detection which enhances road controlling, where it can enforce the traffic safety compliance and provide automatic rescue call facilities in case of remote area fatalities. The proposed approach is comprised of three steps: (a) data acquisition, a dataset of 53 thermograms at various weather conditions has been created; (b) data processing, a thresholding method, morphological operations, and pseudo-coloring have been performed; and (c) results validation, compare the outcomes of proposed methodology with standard approaches. More specifically, the optimal temperature thresholding in conjunction with morphological operations automate the process of object detection, whereas the pseudo-coloring algorithm is introduced to convert the thermograms into RGB space which enhances the images for better visualization. Consequently, the proposed methodology shows a good accuracy of 83% for object detection in different weather conditions. The methodology can be used with UAVs which enables fast monitoring of recent accidents on remote locations as the stalling of vehicles raises the temperature. Besides, the issues and challenges faced in the thermal-based

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Handbook of Greener Synthesis of Nanomaterials and Compounds
 Volume 2, Synthesis At the Macro and Nano Scale
 2021, Pages 503-526

Chapter 22 - Design of electromagnetic absorbers based on green nanomaterials

[Suresha Bhat¹](#), [Anurupa Mukherjee²](#), [Sajay Murali³](#), [Munira Choudhary⁴](#)

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Abstract
 The process of electromagnetic (EM) suppression significantly contributes for the eradication of adverse EM interference (EMI), providing measures for reducing the radiated noise, design of anechoic chamber facilitating EMI measurement making the electromagnetic environment compatible with high-frequency electronic devices. The EM suppression is implemented by designing efficient and wideband EM absorbers. In military applications, particularly in stealth technology, for concealment of an object from radar detection, EM absorber is required to absorb electromagnetic waves mainly lying in the microwave frequency band. In case of antenna arrays, placing an absorbing vice between array elements is able to reduce the mutual coupling effect thus

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Graphene and its Nanocomposites based Microwave Non-Invasive Patch Applicators for Maximum Power Localization

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Alok Singh, Anurupa Mukherjee, Sajay Murali, All Authors

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Abstract
 The design of a non-invasive patch applicator using graphene and its nanocomposites is proposed here to address the issues of localized power deposition in the target site, laser heat generation and specific penetration depth. The graphene material and its nanocomposites, such as graphene oxide (GO) and reduced graphene oxide (RGO) offer several benefits when employed as an absorber at microwave frequencies. The nanomaterial strip when placed on a side layer of the patch applicator controls the radiation pattern of the antenna hence providing significant improvement in directivity and reduction of sidelobe power levels. Initially, the graphene and its nanocomposites-based patch applicators have been designed and performance enhancement of hyperthermia treatment planning is validated from plots of maximum power deposition and specific absorption rate (SAR). Further, it is demonstrated that RGO based microwave patch applicators outperform with a maximum power deposition and SAR value of 30.1 W/cm² and 115.4 W/kg respectively. The realization of nanomaterial based patch applicator design in terms of laser heat generation is demonstrated by obtaining maximum temperature of 318° K in 10 minutes for RGO nanocomposite.

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Keywords: Microwave non-invasive applicator are currently being employed in many therapeutic and diagnostic biomedical applications [1]. Their utility in treatment planning for microwave hyperthermia is the best observed among researchers owing to the reduced risk of infection and enhanced cost saving aspects. The crucial requirements for microwave hyperthermia treatment planning are

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Chapter

Deep Learning for Obstacle Avoidance in Autonomous Driving

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Suresh K. Charles and T. Rangar Babu 26-35

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Changshen Pandey, Koushik Pradeep Singh and Khushboo Rishi Singh 36-44

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Sufu A and A. P. S. Baburaothi 61-65

16. Acquisition and Development of Code-Mixed Corpus for Sentiment Analysis of Romance-Secular Languages
Shikha Singh and Manoj Sachan 76-84

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Raj Kumar Gupta 75-79

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Anuska Tarkenton Das and Lokenarany K. P. 78-84

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Lata Raj Soley, Anshul Anil S., Pradeep Kumar and Jyoti Anand 93-100

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Shikha Mishra K. P. and P. Vijaya Karthik 96-103

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Shikha Mishra, Anshul Anand, Mahesh Agarwal 96-100

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Vijay Singh, Anupam Singh, Ashu Agarwal and Mohini Agarwal 98-107

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Abstract

The phenomenon of surface plasmon resonance (SPR) is the basis of adsorption measurements for many toxic that have resulted in several sensor applications. In this paper, a D-shaped photonic crystal fiber (PCF) based surface plasmon resonance (SPR) sensor with dual coating of conducting metal oxide is proposed. A brief study is performed to analyze the use of dual coated metal oxide plasmonic material to enhance the lower refractive index (RI) chemicals. Firstly, the flat surface of photonic crystal fiber is coated with Indium Tin Oxide (ITO) followed by a coat of Zinc Oxide (ZnO) to enhance the gain/propagation generation. The SPR wavelength is tuned to the infrared region by changing the metal doping concentration. The external flat surface of the sensor is more convenient for liquid infiltration than liquid filling into small circular holes in conventional PCF sensors. The proposed sensor design has maximum wavelength sensitivity of 10000 nm/RIU in the RI detection range of 1.30-1.39 with a resolution of 2.6×10^{-4} and can be utilized specifically in the lab-on-chip technology for healthcare industry.

Published in: 2021 IEEE 18th Nanotechnology Materials and Devices Conference (NMDC)

Date of Conference: 12-15 December 2021 **INSPEC Accession Number:** 21552548

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Use of nano-biomaterials for adsorption of heavy metals from wastewater - a review

AIP Conference Proceedings 2352, 020096 (2021). <https://doi.org/10.1063/5.0053485>

Kiranpreet Kaur¹ and Oshin Kumar Yadav²

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ABSTRACT

Rapid industrialization and poor waste management has resulted in contamination of water resources. Water pollution due to heavy metals has become a matter of threat worldwide. A number of techniques for wastewater treatment have been analyzed and the advantages of adsorption over the conventional techniques have been listed out. In the recent decades, a large number of biomaterials have been studied for sustainable removal of these heavy metals from wastewater through adsorption. These have been found as potential adsorbents for the purpose in their different forms. However, development and use of nano-biomaterials have shown better results for sequestering heavy metals from wastewater during recent past. In this paper the development and use of various nano-biomaterials for heavy metals removal from wastewater have been reviewed scientifically. The mechanism for the process has been identified and effectiveness of various nano-biomaterials reported by various scientists has been evaluated in this process.

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Equilibrium and thermodynamic studies on adsorption of Cadmium(II) from aqueous solutions by using powdered pods of Dalbergia sissoo

AIP Conference Proceedings 2352, 020094 (2022). <https://doi.org/10.1063/5.0052583>

Gabriel Kestor Javali¹ and Saravap Menon Ariga²

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ABSTRACT

Water pollution has become a matter of great concern for the globe. During the recent past, a lot of work has been undertaken to explore low cost alternative techniques for treatment of aqueous streams consisting of toxic metals. The use of biomaterials has attracted the researchers in the field to remove heavy metals from water streams through adsorption. The method has been found well suitable to overcome the disadvantages of conventional methods like cost, sludge formation, regeneration of adsorbent, time and energy consumption. In the present study, pods of Dalbergia sissoo have been used for evaluating factors affecting the process and equilibrium analysis of Cd(II) removal from aqueous solutions in their raw powdered form through batch experiments. Freundlich and Langmuir isotherms were applied for studying adsorption behavior. Thermodynamic studies were made to find feasibility of the process. From the results, it is evident that present biomaterial can be used potentially for Cd(II) removal from water streams.

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Jyoti Singh, Sanjay Kumar Choudhury & Saikat Mukherjee

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The Delay Tolerant Networks (DTNs) are types of ad hoc networks that can be used to realize a wide range of applications in a challenged environment. Despite the challenges of intermittent connectivity and unpredictable mobility characteristics, the mobile nodes need to communicate and share their valuable information without the need of an infrastructure. Socially aware networking is an emerging paradigm for high-efficiency data dissemination. Existing protocols take advantage of mobile nodes' social characteristics such as user interests to improve the dissemination performance. However, these protocols have not explored enough the types of relations that are valuable between user interests and how these relations can affect the dissemination of social DTNs. In this context, this Chapter investigates the problem of data forwarding in social-based networks. Several realistic datasets will be explored to reveal both the geographical and social regularities of human mobility; the concepts of geocommunity and geocentrality into social network analysis will also be studied and the geocommunity characteristics as well as the envisioned application areas different

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Synthesis and characterization of palladium nanocomposites prepared by atom beam sputtering technique

AIP Conference Proceedings 2332, 040002 (2023); <https://doi.org/10.1063/5.0052334>

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ABSTRACT

Pd nanoparticles in C matrix have been deposited by atom beam sputtering using a gun as atom beam source. The concentration of Pd in nanocomposite system has been varied from 5 at.% to 40 at.%, which shows full range from well below the percolation threshold (30 at.%) to above the percolation threshold value of Pd in matrix. Structural characterizations by GAXRD studies show the presence of (111) peak at around $2\theta = 39.8^\circ$ in nanocomposite film, which reveals the formation of FCC structure of Pd. TEM studies demonstrate the formation of spherical shape nanoparticles. The size of nanoparticles increases from 2.8 nm to 4.4 nm and interparticle separation decreases with increasing concentration of Pd from 5 to 40 at.%.
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Calculated values of jump factor and jump ratios of lanthanum compounds in K shell and L₁, L₂ and L₃ subshells

AIP Conference Proceedings 2332, 050023 (2023); <https://doi.org/10.1063/5.0053046>

K. S. Kishor¹, A. S. Ghoshal², Anuj Singh³ and Anshuman Kumar Gupta⁴

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ABSTRACT

Absorption jump factors and jump ratios parameters are required in many areas of industries. Lanthanum is utilized in picture industry and for studio lighting and projection. Due to this reason it is important to calculate the absorption jump factor (j) and jump ratios (r) of lanthanum compounds to explore the potential applications of these compounds. The jump factors and jump ratios have been calculated using mass attenuation coefficient. The theoretical values of mass attenuation coefficient were obtained by using WinCom, based on the mixture rule. The jump ratios ($r_{L_{2,3}}$) and jump factors ($j_{L_{2,3}}$) of Lanthanum compounds have been calculated for the first time. These different compounds have different jump ratios and jump factors for Lanthanum compounds near edges. It is expected that mass attenuation coefficient for Lanthanum compounds will vary near edge. It is found value of jump ratios for K, L₁, L₂, L₃ vary from 1.653 to 5.853, vary from 1.069 to 1.353, vary from 1.2 to 1.351 and vary from 1.316 to 2.814 respectively. It is also seen that value of jump factor for K, L₁, L₂, L₃ vary from 0.395 to 0.829, vary from 0.065 to 0.153, vary from 0.16 to 0.26 and vary from 0.240 to 0.647 respectively. No experimental or theoretical values of these parameters are available in literature for comparison.
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An Effect of Current on Mechanical Properties and SEM Characterization of Butt Joint of Aluminium AA6082 Using GTAW

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Abstract

Aluminium alloys are almost vital in most of the lightweight components made by most of the joining processes. Most influential property of these alloys is corrosion resistance. Welding is one of the most reliable joining processes of aluminium alloys, especially for structural components. Joining of aluminium alloys is accomplished by tungsten inert gas welding (TIGW) as it is relatively easier to apply better and low-cost. In the present study, varying

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Phonon dispersion and density of States of Fe_2SiO_4 in spinel phase

AIP Conference Proceedings 2352, 020095 (2021), <https://doi.org/10.1063/5.0052582>

Narban Kaur¹ and M. M. Saha²

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ABSTRACT

Fe_2SiO_4 , an end member of Mg-rich (Mg,Fe) $_2SiO_4$ olivine is a major mineral in Earth's upper mantle. The investigation of lattice dynamical properties of spinel form of magnesium-iron orthosilicate, (Mg,Fe) $_2SiO_4$, is of high interest due to its geophysical importance. Hence, in the present study, the zone center phonons in Fe_2SiO_4 spinel are investigated using a short-range force constant model involving interatomic interactions upto first three neighbours. The theoretically obtained Raman and infrared frequencies are compared and analyzed with experimental results and are found to be in good agreement. The phonon dispersion curve and phonon density of states have also been calculated for γ - Fe_2SiO_4 . The absence of any imaginary phonon frequency in the phonon spectra indicates that the material is dynamically stable in the spinel structure.

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Theoretical investigation of electronic and vibrational properties of topological semimetal LaAuPb

AIP Conference Proceedings 2352, 023033 (2023) <https://doi.org/10.1063/5.0052491>

Shekhar Ghosh¹ and M. M. Saha²

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ABSTRACT

Recently, research of some ternary half-Heuslers compounds belonging to MgAs type crystal structure has become very significant due to their exposure of a new quantum state named Topological phase with nontrivial band order. So, a first principle study of structural and electronic properties of LaAuPb has been made using density functional theory (DFT). We have employed the plane wave pseudo-potential method within a local density approximation (LDA) to compute all these properties. The electronic band structure shows zero band gap with inversion of bands. The present calculated results are in good agreement with other theoretical and experimental results available in literature. Apart from this, the phonon dispersion curve and phonon density of state are plotted using density functional perturbation theory. The zone center frequencies are also computed for the first time.

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AIP Conference Proceedings 2352, 023027 (2023) <https://doi.org/10.1063/5.0052345>

Tanweer Akbar¹ and M. M. Saha²

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ABSTRACT

The inherent exotic properties of Heuslers have drawn great research attention in the field of material science. In present work, the first principle study of structural, elastic and mechanical properties of VCo₂Al has been made using Density Functional Theory (DFT) within generalized gradient approximation (GGA). The structural parameters have been evaluated by performing optimization of VCo₂Al at 0 GPa. The computed values of elastic constants (C₁₁, C₁₂, C₄₄) confirm the mechanical stability. The mechanical constants signify brittle and covalent bonding of VCo₂Al. It is worth mentioning that elastic and mechanical properties have been reported for the first time.

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Thermoelectric properties of Weyl semi-metal ZrTe

AIP Conference Proceedings 2352, 020064 (2020). <https://doi.org/10.1063/5.0052526>

Tavneet Kaur¹, M. M. Sinha¹ and S. S. Verma¹

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ABSTRACT

The present research article reports the thermoelectric properties of the Weyl semi-metal ZrTe by employing density functional theory in combination with the semi-classical Boltzmann transport theory. The thermo-electric parameters such as Seebeck coefficient, electrical conductivity, electronic as well as lattice thermal conductivity are evaluated and the variation in these parameters via a change in temperature, chemical potential as well as the change in doping concentration of ZrTe are also computed. The calculated values of lattice thermal conductivity decrease with the increase in temperature values; this factor favours the thermoelectric response of the Weyl semi-metal ZrTe. As the calculated highest peaks of the Seebeck coefficient concerning the change in doping concentration lies in the negative region, which determines that ZrTe is an 'n-type' thermoelectric material.

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Continuously increased requirement of electricity because of population, higher living standards, and the hurried race in automation directs the world to use the waste and non-conventional sources of energy. In the present work, unwanted vibration from an electric motor is used to generate electric power with the help of the piezoelectric element. Piezoelectric is a special class of dielectric which generates electric power because of their structural deformation under force and vibration. The piezoelectric material lead zirconate titanate (PZT) is mounted between the electric motor's base and foundation. The output of the piezoelectric element is measured under three different conditions of the motor operation such as 60 idle turning, 80 loaded with a grain-grinding machine, and 60 loaded with a chaff cutter machine. The maximum power generated from diaphragm-type single piezoelectric element was 48.05 μW when the motor was connected to a chaff cutter. To increase power output, two pieces of piezoelectric elements are connected in series and parallel connections. The power output obtained from two piezoelectric materials connected in series and parallel is

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Moisture-dependent dielectric properties of soils of Faridkot region (Punjab) at 9.08 GHz

AIP Conference Proceedings 2352-020061 (2021) | <https://doi.org/10.1063/5.0052715>

Prachi Pathak¹, Pooni Parkar¹, Prashant Fauz, and Siddhi Singh Mann

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ABSTRACT

In this paper, dielectric properties of soils of Faridkot region (Punjab) are presented as a function of moisture content corresponding to X-band frequency 9.08 GHz. Cavity perturbation technique was used to find the values of dielectric constant and dielectric loss factor in moisture content range 2–15% (w. b.). Results showed that a considerable variation in dielectric properties is caused by change in moisture content for soils of Faridkot region. Dielectric constant and dielectric loss factor both showed an increasing trend with increase in moisture content 2–15% (w. b.). Variation in dielectric constant is more as compared to dielectric loss factor in entire moisture range. Further, a block wise comparison of moisture-dependent dielectric properties of Faridkot is presented in form of third order polynomial fitting.

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Abstract

This paper discusses the role of implementing Heijunka, a Lean manufacturing tool in improving the productivity of Indian automotive industry. Lean manufacturing is a business excellence strategy centered around waste reduction through continuous improvement, resulting in improvement of productivity, competitiveness, quality causing greater customer satisfaction. Heijunka is aimed at smoothing the production and subsequently creating the opportunities to improve manufacturing environment. It prepares the industries to face the demand which is about to generate in the near future. The study reveals that the results of Heijunka implementation are quite substantial in terms of improvement in quality, productivity and customer satisfaction. The industry under the study transitioned its old-fashioned production system into tried production system. This was done to ensure pull production system. Heijunka flow was established in all the tasks in order to ensure smooth flow of the material without any unwanted inventory. Coming to the above change, industry reported improvements in human productivity, machine productivity by 62% and 29% respectively, along with the morale of the employees.

Keywords

Lean manufacturing, Heijunka, Productivity, Competitiveness, Quality

Trend production system, Heijunka flow, Human productivity, Machine productivity

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Abstract

The world is facing difficulties to make a bridge between energy production and demand due to the diminishing of fossil fuel reserves. Energy resources are limited and unevenly distributed across the globe. Because of waste to wealth, the lignin from industries may play as a metamorphic generator in biorefineries to enhance the life cycle assessment as well as to meet the ever-increasing global demand for myriad products. From the perspective of lignin valorization, the production of valuable chemicals, different extraction techniques, structures, global market potential and SWOT analysis will be spotted and reviewed. Markets that are growing lignin-specified biorefinery are expected from 8743 USD in 2020 to 1537.1 million USD by the end of 2026. Despite the availability of bountiful lignin as an aromatic substrate, its recalcitrant nature restricts the easy and economical production of valuable products. This review study also aims to understand the latest market trends, strategies, and challenges of lignin and its products globally.

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3. Hollow fiber membrane contactors (HFMCs)
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Highlights

- There has been an upsurge in the number of researchers worldwide who are keen on improving CO₂ capture by HFMCs.
- This investigation was centred on recent advancements in polymeric membrane synthesis and the potential CO₂ capture by HFMCs.
- In large-scale applications, the choice of solvent is critical for HFMC integration with solvent technology.
- Polymeric CO₂ capture membranes have emerged to separate lean flue gas from rich permeate.
- The use of polymeric membranes in HFMCs avoids thermodynamic solubility restrictions.

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Chapter

Investigating the Effect of Magnetic Nanoparticles in Magneto-Rheological (MR) Fluid for Monotube Damper Testing

By Jonny Singla, Anuj Bansal, Anil Kumar Singla, Deepak Kumar Goyal

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ABSTRACT

Vibration acts as an undesirable and unavoidable phenomenon in several engineering applications. Different types of dampers have been used in the past to shorten the effect of this menace. Out of these dampers, magneto-rheological (MR) fluid dampers have shown remarkable potential to mitigate the effect caused by vibrations. The use of magnetic nanoparticles in MR fluid damper has to be explored for their better efficiency and performance. Therefore, in this research work, effect of magnetic nanoparticles in MR fluid has been

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Structural, electronic, vibrational, thermoelectric and mechanical properties of Li based quaternary Heusler compound LiTiCoSn: A DFT approach

Jasal Singh,^a K. Kulwinder Kaur,^b Shakeel Ahmad Khawari,^c Megha Goyal,^d Shubhika Dhillon,^a S.S. Verma^a

Highlights

- A newly discovered material is investigated by density functional theory.
- Calculation of electronic, vibrational, thermoelectric, structural and mechanical properties.
- Semiconducting nature with high melting point.
- Band gap of 0.85eV.
- Figure of Merit (ZT) is 0.16 at 700K.

Abstract

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Feature Selection Based on Gaussian Ant Lion Optimizer for Fault Identification in Centrifugal Pump

Geetal Vaidya & Rajesh Kumar

Conference paper | First Online 04 October 2022

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Abstract

Fault diagnosis of the rotating machinery using vibration signal is largely carried out by experience with some prior knowledge of the signal. The diagnosis process is simplified by using machine learning algorithms. The learning capabilities and classification performance of such machine learning models are mostly influenced by the quantity and quality of the input features. Thus, the appropriate selection of a subset of the most prominent features for machine learning becomes essential to eliminate redundancy of high dimension or irrelevant measurements of the features. In this paper, a filter-based feature selection technique is introduced to select the optimal feature space. A Gaussian ant lion optimization (GALO) is put in with a filter-based selection technique to select the feature subset from a high dimension feature dataset obtained from the vibration signals of centrifugal pump under different health conditions (normal, clogging, wheel cut and blade cut). The K-nearest neighbour (KNN) classifier is applied to the selected feature subset to find the classification accuracy. It is compared with other art of work. The results reveal

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Abstract
 In this work, we propose and evaluate a novel method to synthesize 12-lead ECG from 3-lead ECG by combining principal component analysis (PCA) and artificial neural network (ANN). PCA is applied on ECG signals to obtain the principal components which are then used to train an ANN. Performance is evaluated using cross correlation coefficient, root mean square error, and wavelet energy based diagnostic distortion measure between original and synthesized leads. Performance evaluation shows that the proposed method is an efficient way to synthesize 12-lead ECG from 3-lead ECG without loss of significant clinical information.

Keywords
 Electrocardiogram | ECG synthesis | Derived 12-lead ECG
 Principal component analysis | Artificial neural network

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COMPARISON OF BIOMASSES AS ADSORBENT MATERIALS FOR PHENOL REMOVAL

PUSHPA JHA
Department of Chemical Engineering, Sree Longowal Institute of Engineering & Technology, India

ABSTRACT
India is a producer of a colossal number of biomasses with high quantity. Even after using them for energy generation, large proportions of residues remain unutilised. They could be utilised as an adsorbent-material to get rid of phenol from aqueous streams. Phenol is listed as highly toxic as per available databases. Thermo-chemical treatment methods have been widely reported to improve the characteristics of biomass-based adsorbents. In this work, based on the availability, three biomasses, *Acacia Nilotica* Branches (AC), *Lantana Camera* (LA) and *Rice-Husk* (RH), were given the treatment. The resulting activated forms of adsorbents were named activated *Acacia Nilotica* Branches (ACC), activated *Lantana Camera* (LAC) and activated *Rice Husk* (RIC). The materials obtained had a high content of fixed carbon, iodine number, BET surface area, and methylene blue adsorption. The operating parameters for sorption in terms of dosage, pH, time of contact, initial phenol concentration and agitation speed were optimised. At these conditions, the adsorption isotherms were compared, and they were explained by Langmuir, Freundlich, and Temkin models. LAC and RIC, respectively followed pseudo-first-order and pseudo-second-order models. Kinetics of the process on adsorbents considered followed pseudo-first-order and pseudo-second-order models.
Keywords: acacia nilotica branches, adsorbent, adsorption isotherms, adsorption kinetics, adsorption parameters, biomass, characterisation, Lantana camera, rice-husk, phenol.

1 INTRODUCTION
A large number of biomasses are produced every year [1], [2]. Farmers are seen burning them as a solution to clearing and preparing the fields for the next crop. The process generates greenhouse gases. Biomasses have a high moisture content and low bulk density, making them difficult to transport from one place to another. So it is mandatory to investigate various possible ways to utilise them at the exact location as its production [3]. The literature review gives an account of various biomasses applications as adsorbents for the removal of organic compounds, especially phenols in industrial effluents [4]-[8]. In

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AIP Conference Proceedings 2352, 050040 (2021). <https://doi.org/10.1063/5.0052493>

Rajveer Kaur¹, M. Gupta², P. K. Kulczyński³, and S. S. Ghuman⁴

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ABSTRACT

Over the past 60 years, the safe disposal of high-level wastes (HLWs) produced during reprocessing of spent nuclear fuel has become a serious issue and a world-wide challenge. The radionuclides contained in HLWs severely affect the biosphere due to their long half-life and high radiotoxicity. In order to meet this challenging task, the research is underway to develop an advanced stable nuclear waste form which will be capable to accommodate the radiation effects under repository conditions and over geological time scales. Among potential waste forms, zirconolite has been proven to be a good candidate for the desired purpose due to its high radiation and thermal stability and high loading capacity to accommodate the wastes of lanthanides and actinides without any effect on the crystallinity

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Magnetolectric multiferroic, y-type hexaferrites – A review

AIP Conference Proceedings 2352, 020084 (2021). <https://doi.org/10.1063/5.0052452>

Prabhat Dubey¹, Rajveer Kaur, Jyoti S. Ghuman

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ABSTRACT

Magnetolectric (M-E) multiferroics are materials in which electric and magnetic dipoles are coupled. The possibility to control electrical properties in the material using magnetic field (and vice versa) in case of ME multiferroics make these materials highly versatile and useful. Over the years many magnetically induced ferroelectrics have been discovered but they show ME effect at low temperature and require high external magnetic field. Recently many Y-type hexaferrites (Ba₂Fe₁₂O₂₂Me₂Fe₂O₁₀), where Me is a divalent cation, have shown ME effect at room temperature and low applied magnetic field, that too in a single phase. Studies suggest that there are several factors that influence the ME properties of Y-type hexaferrites, such as sintering process, the sintering temperature, and ion substitution. It was reported that the lower critical magnetic field was required for inducing electrical polarization when Mg replaces Zn to form Ba₂Mg₂Fe₁₀O₂₀. Also, it was reported that Strontium doping at Barium site changes the magnetic transition temperature and enhances the ME effects. And it was found that increasing Co content favours high electrical reactivity. Further research and development require careful analysis and compilation of the work on hexaferrites. Y-Type hexaferrite is the focus of this review. Its structure, reason behind ME effect and salient research works has been discussed.

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Quaternary Heusler compound LiVNiSn: A search of new thermoelectric material by DFT study

AIP Conference Proceedings 2162, 05005 (2023) <https://doi.org/10.1063/5.0052372>

Jagdeep Singh¹, Kanchan Kaur², Megha Gupta³, Oshkar Arshad Khattak⁴, Shobana Chinnai⁵, and S. S. Verma⁶

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ABSTRACT

In the present work we explore the electronic, vibrational and thermoelectric properties of new Li based quaternary Heusler compound LiVNiSn that is recently proposed by Jiangang He et al. [Chem. Mater. 30 (2018) 4878] which is based on the 18-electron rule. Here the theoretical calculations are performed within the approach of density functional theory and semi-classical Boltzmann transport equations with the constant relaxation time approximation. The band gap of the proposed compound is 0.38 eV that is in agreement with the available results in literature. The Seebeck coefficient and the Figure of Merit (ZT) are calculated at three different temperatures (300K, 600K and 700K) with respect to the chemical potential (μ). The maximum ZT recorded is 0.14 at 700 K temperature. The compound is reported first time as the thermoelectric material and can be beneficial in the experimental research of thermoelectrical materials.

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Theoretical calculation of absorption properties of NiFe@Au core-shell nanoparticles

AIP Conference Proceedings 2162, 05005 (2023) <https://doi.org/10.1063/5.0052377>

Shobana Chinnai¹, S. S. Verma², and S. K. Saha³

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ABSTRACT

The multimetallic nanostructures of a noble metal such as gold, silver, and copper have attracted great attention in alloys and core-shell configuration due to the enhanced plasmonic effect. In this theoretical study, the optical properties of bare NiFe and NiFe@Au core-shell NPs have been calculated using extended Mie theory. The core-size of nanostructures is considered 5 nm to 25 nm and shell thickness systematically varied as 3, 5, 7 and 10 nm. It is observed that the localized surface plasmon resonance peaks are red-shifted with increasing shell thickness and blue-shifted with increasing core-sizes. Further, broadening in LSPR peaks is found, as the size of core-NiFe NPs increased and optical efficiency increases with Au-shell thickness. The LSPR peaks at λ_{max} show the absorption spectra in the range of 305-541 nm wavelengths and hence, absorption peaks are found in the visible region. In addition, LSPR peaks of NiFe (permalloy) coated with Au NPs are influenced by changing the refractive index of the embedded medium. Hence, the optical response of NiFe coated with Au nanoparticles can be tuned and controlled in the visible region of the electromagnetic spectrum. From the results, it is revealed that varying either NiFe-core or Au-shell thickness and embedded medium could result in obtaining tunable light absorption in UV-visible and may find application in optical imaging, sensing, medical, and novel functional and biomagnetic devices.

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ACTIVE VIBRATION CONTROL OF TWO FLEXIBLE LINK UNDERWATER MANIPULATOR

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ABSTRACT

In undersea conditions, there are unknown disturbances or vibrations, that are required to be taken care of. It is very difficult to achieve steady state once base of underwater manipulator (UM) vibrates in underwater condition. In this regard an attempt has been made to develop and implement active vibration control strategy for two link flexible UM. Information from base and joints through Jacobian are fed to the controller. Controller, accordingly, actuates the force to makeup external disturbances to achieve steady state. A bond graph model has been created in SYMBOL software. Simulation output shows the efficacy of the developed active controller.

Keywords: Active vibration, Underwater Manipulator, Bond Graph, Control, Jacobian matrix

1 INTRODUCTION


Regular disturbances in oceans are major issues to be taken care for underwater vehicles and robots (UVR). There are number of control strategies for

In these cases, vibrations are controlled by using passive or semi-active or active controllers. Innovative electronic micro components have played vital role for actuation, sensing and controlling through active control (Janocha 2007 and Brahm 1998). For an ground manipulator

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Gigantic growth of text mining is becoming a potential source of crowd wisdom extraction and analysis especially in terms of text pre-processing and analysis. The ubiquitous growth in the text mining field is unprecedented where social media mining is playing a significant role. Therefore, it's a significant task of current research

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Moment of inertia of generalized magic cubes

AIP Conference Proceedings 2352, 030002 (2023); <https://doi.org/10.1063/5.0052389>

Harish Ranjan and Vinod Mishra

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ABSTRACT

In this article the method for the construction of an odd order magic cube is introduced. The moment of inertia of a magic cube is evaluated by showing the case of a special kind of third order magic cube and interpreting them as a rigid body mass distributions. The moment of inertia depends only on the semi-magic property and the number of point masses along each n -tuple of elements having the same co-ordinates on two planes. The moment of inertia is calculated by changing the position of the origin of the co-ordinate system and the axis of rotation. Next, the concept of center of mass is explained for magic cubes.

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On the circulant matrices with Ducci sequence and Gaussian Fibonacci numbers

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ABSTRACT

In this paper, we find images D_4 and D_4^A of n -tuple vector $A = (G_0, G_1, \dots, G_{n-1})$ under Ducci map. Then we find Frobenius norms of $\text{circ } A$, $\text{circ } D_4$ and $\text{circ } D_4^A$. We establish relations of these norms. Further, we find determinants of these circulant matrices.

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Kaleem Ahmad, Himadri Roy Ghatak & Sandeep Mohan Ahuja

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Abstract

The world is facing difficulties to make a bridge between energy production and demand due to the diminishing of fossil fuel reserves. Energy resources are limited and unevenly distributed across the globe. Because of waste to wealth, the lignin from industries may play as a metamorphic gamester in biorefineries to enhance the life cycle assessment as well as to meet the ever-increasing global demand for myriad products. From the perspective of lignin valorization, the production of valuable chemicals, different extraction techniques, structures, global market potential, and SWOT analysis will be spotted and reviewed. Markets that are growing lignin-specified biorefinery are expected from 874.3 USD in 2020 to 1537.1 million USD by the end of 2026. Despite the availability of bountiful lignin as an aromatic substrate, its

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Abstract

This chapter introduces the recent innovative trends in the sustainable and green chemical recycling of post-consumer-discarded polyethylene terephthalate (PET) waste and their pertinence to substantiate and understand the conception of circular economy. This chapter also includes a comprehensive worldwide view on linear economy of plastics, especially PET, and its shift onto circular economy. PET is a multipurpose and highly recyclable polymer resin. It is a thermoplastic polyester synthesized through the polymerization reaction between ethylene glycol (EG) and terephthalic acid, initially prepared in 1940 by DuPont chemists in North America. PET is a comparatively inexpensive, resealable, burst-resistant, light in weight, and recyclable in nature. Due to thermostability, transparency, and optimum strength, the PET

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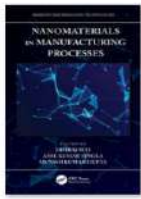
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14 - Conductive polymer-based composite photocatalysts for environment and energy applications

Jagdeep Singh,¹ A.S. Dhaliwal,¹ Kabhma Sharma,² Rakesh Sehgal,¹ Vijay Kumar,^{4*}

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Abstract

Photocatalysis is an important technique that has been used to degrade/separate numerous pollutants from wastewater and for the generation of green energy such as clean hydrogen by splitting of water. In general, titanium dioxide-based photocatalyst is used in photocatalysis because of its nontoxicity, mechanical stability, high photocatalytic activity, and low price. Moreover, its large bandgap and high charge carrier recombination lead to poor photocatalytic activity. To overcome these limitations, photocatalyst based on conducting polymers (CPs) have come into the picture because it provides unique one-dimensional delocalized electrons in their structures and has been

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Abstract

Polyaniline (PANI) film synthesized by cyclic voltammetry method. Rectangular strip of stainless steel (SS) is used to construct low cost electrode for Supercapacitors. PANI films are characterized by field-emission scanning electron microscopy (FE-SEM), X-ray diffraction analysis (XRD), Chemical structure and electronic behavior of PANI film is carried out by Fourier transform infrared (FTIR), and ultraviolet-visible (UV-Vis) spectroscopy, respectively. The electrochemical performance of PANI film carried out by cyclic voltammetry in 1M H₂SO₄ giving specific capacitance of 346 Fg⁻¹ at sweep rate 10 mVs⁻¹ with 63% capacitance retention after 1000 cycles at sweep rate 100 mVs⁻¹.

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Synthesis and characterization of Graphene Oxide and its reduction with different reducing agents

Karan Bansal¹, Jagdeep Singh¹ and A. S. Dhaliwal¹

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Ionic Liquids in Analytical Chemistry
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Chapter ONE – Structure and properties of Ionic liquids: Green aspects

Anita Singh*, Nirmuldev Kaur*, Anupama Parmar*, Harish Kumar Chhabra*

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Abstract

Ionic liquids comprise an important class of materials having vital applications in numerous research fields. In this chapter, an overview of the important properties of the ionic liquids and the effect of the different structural features on the properties of the ionic liquids has been presented. Also, various types of ionic liquids, their synthesis, properties, and applications are reviewed in the light of recent literature.

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Chapter 11

Prebiotics and their Role in Functional Food Product Development

Dhyanl Panesar, Parmjit Singh Panesar, Anuradha Saini
Book Editors: Parmjit Singh Panesar, Anil Kumar Anil
First published: 07 January 2022 | https://doi.org/10.1002/9781119702160.ch11

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Summary

Growing awareness regarding the importance of gut microbiota on health and disease has led to an increased demand for the identification of novel food ingredients exhibiting potential functional properties. Prebiotics are non-digestible food ingredients that selectively stimulate the activity and/or growth of specific gut microorganisms. This modification in the composition of gut microbiota maintains a favorable balance in the gastrointestinal environment, thereby conferring benefits to host health. Moreover, consumption of prebiotics is also known to reduce the risk of numerous chronic diseases including cancer, cardiovascular diseases, diabetes, obesity, inflammatory bowel disease, etc. Therefore, owing to their numerous health benefits, prebiotics have received immense attention from the food and pharmaceutical sectors. Numerous types of prebiotics such as galactooligosaccharides, inulin, fructooligosaccharides, etc., have already been established in the global market, however, more research is being done to explore the prebiotic effects of other food ingredients including polyphenols, dietary fibers, etc. Besides, these compounds are usually isolated from natural sources in low

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E-FFTF: An Extended Framework for Flexible Fault Tolerance in Cloud

Authors: Moin Hasan, Major Singh Goraya, Tanya Garg
 Published in: IoT and Analytics for Sensor Networks
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Abstract
 Fault tolerance provisioning is extremely important in cloud. Literature suggests that the existing frameworks are service provider centric. Being user-centric, fault tolerance in the cloud should be flexible with respect to the users' requirement. Our previously proposed framework

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Designing of a Novel PCF Biosensor having Octagonal Core and based on SPR for Chemical and Heavy Metal Sensing

Publisher: IEEE

Ami Kumar Shukla, Suresh Singh, All Authors

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Abstract: A novel model of the "photonic crystal fiber (PCF)" surface plasmon resonance (SPR) biosensor is presented in this work. The sensor is designed in a manner that it can detect eight cores. The sensor can detect analytes: chemicals, heavy metals, embedded water samples, water samples, etc. The metal deposition technique at the outer end of the PCF is used in the "proposed sensor design" to deposit plasmonic material. Sensor parameters are calculated in terms of "wavelength sensitivity," "refractive index sensitivity," "sensor resolution," "linear relationship between refractive index and resonance wavelength." Finally, the designed sensor has presented reasonable sensing parameters better than the reported sensors in recent times.

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Date of Conference: 17-20 January 2022
 Date Added to IEEE Xplore: 21 March 2022

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Synthesis and Characterization of Copper (II) Schiff Base Metal Complex for Environmental Remediation

Hemant Kumar Amandeep Kaur Amit Rai

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The present work is focused on the synthesis and characterization of Schiff base ligand along with its metal complex from dialdehyde and primary amine. Repeated melting temperature and spectrum studies such as IR and ¹HNMR were used to analyse the synthesized Schiff base, and its corresponding metal complex. The photocatalytic degradation of Methylene blue (MB) dye was studied in the presence of an oxidising agent such as H₂O₂ spectrophotometrically by the synthesized Cu(II) metal complex on irradiation of visible light radiation. The degradation of MB dye was studied in terms of regular time interval. The outcomes clearly reveals that the MB dye can be degraded and almost mineralized completely by using the synthesised copper catalyst. The photocatalysis of complex were studied using various

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Copper(II)-Catalyzed Ring Opening Polymerization of Cyclic Esters

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 Cu(II)-catalyzed synthesis of bio-molecular weight linear and hyperbranched polyesters at ambient temperature. Biodegradable polyesters are among the materials, which have been widely used in various fields such as tissue engineering and regenerative medicine. Particularly, the low-molecular weight biodegradable polymers have received attention in medical applications as materials for molecular engineering. Controlled/living ring opening polymerization (ROP) of cyclic esters is the most efficient method for the synthesis of polyesters of desired molecular weight. Herein, we describe copper perchlorate hexahydrate (Cu(ClO₄)₂·6H₂O)-catalyzed synthesis of poly(ϵ -caprolactone) (PCL) and poly(δ -valerolactone) (PVL) under solvent-free conditions at room temperature in the presence of benzyl alcohol, 1,3-pentanediol and propargyl alcohol as external initiators. In addition, star-branched PCL and PVL have also been synthesized using controlled and biodegradable

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Groundwater Quality Assessment by Using Water Quality Index for Block Abohar, District Fazilka in Punjab

Kaleem Ahmad, Amit Rai & Dinesh Chand

Conference paper | First Online: 12 May 2022

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Abstract

The Abohar block of district Fazilka, Punjab is one of the highest fertilizers consuming block. This is the biggest cotton-producing belt in Punjab. The economy of this area is basically depends up on cultivated crops because about 75% of population are mainly involve in agricultural activities. The proposed work is mainly focus on assessing the groundwater quality of the Abohar block. The samples of groundwater from the different stations of different villages were taken for a comprehensive physicochemical analysis. Nine water quality parameters were considered as pH, Bicarbonate, Total hardness, Calcium, Chloride, Nitrate.

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Classification of Worm Gearbox Fault Using Dendrogram Support Vector Machine

Surinder Kumar & Rajesh Kumar

Conference paper | First Online: 04 October 2022

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Abstract

Worm gearbox has wide range of applications such as in agitators, crushers, mixers, elevators, extruders, and cranes. The fault in gearbox leads to breakdown of the machinery. Early detection of fault in worm gearbox can prompt for economical preventive maintenance which ultimately prevents the breakdown and the production losses. Classification of the fault of worm gear is the first step of ensuring the gearbox protection. In this paper, a robust classification scheme based on autoregression minimum entropy deconvolution (AR-MED) and dendrogram support vector machine (DSVM) has been proposed to classify the faults of worm gearbox. AR-MED filter is used to remove the regular pattern of the gear and enhance the

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Investigations on Excellent Selectivity and Performance for Removal of Anionic Azo Dyes from Wastewater Using Terephthalaldehyde Crosslinked Chitosan Copolymerized with Acrylamide

Modini, Garg & Dhiya, Sud
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Abstract
This study aims to synthesize and characterize crosslinked chitosan hydrogel and to utilize for adsorption of anionic azo dyes. The chitosan biopolymer was copolymerized with a vinyl monomer, acrylamide, and crosslinked with terephthalaldehyde via eco-friendly sonication

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Chapter

Internet of Things: Challenges and Research Opportunities

By Mandeep Kaur, Manminder Singh

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ABSTRACT
Internet of things (IoT) is a widely used technology based on sensors. The main idea behind IoT is the machine-to-machine communication in which every device is connected and collects or sends information using sensor technology. IoT is implemented in various scenarios like healthcare, environment monitoring, motion monitoring,

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Outline

Abstract

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9.1. Introduction

9.2. Chiral recognition using NMR spectroscopy

9.3. Chiral recognition using fluorescence spectroscopy

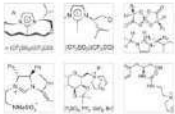
9.4. Chiral recognition using gas and liquid chromatography

9.5. Chiral recognition using capillary electrophoresis

9.6. Concluding remarks and future directions

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Abstract

The separation and purification of the chiral compounds have dragged considerable attention towards the chiral recognition and separation methods. The various chiral selectors such as chiral crown ethers, polysaccharides, or antibiotics were used for the recognition of enantiomers, but each one of these has its own limitation. In this framework of extracting enantiopure compounds, chiral ionic liquids (CILs) have appeared as cheap and lucrative chiral selectors. The role of CILs in chiral recognition of the enantiomers using various analytical techniques such as nuclear magnetic resonance and fluorescence spectroscopy, liquid and gas chromatography and capillary electrophoresis is discussed in this chapter.

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