



ATMA RAM SANATAN DHARMA COLLEGE

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2nd International Conference on

Recent Advances in Functional Materials (RAFM-2024)

Under the aegis of IQAC and DBT (GoI) star college scheme

Certificate of Appreciation

This certificate is presented to Prof./Dr./Mr./Ms.

Jelena Petrović

Institute for Technology of Nuclear and Other Mineral Raw Materials, Serbia

for his/her valuable contribution as **Plenary Speaker** on topic entitled

Hydrochars as novel functionalized materials for heavy metals removal

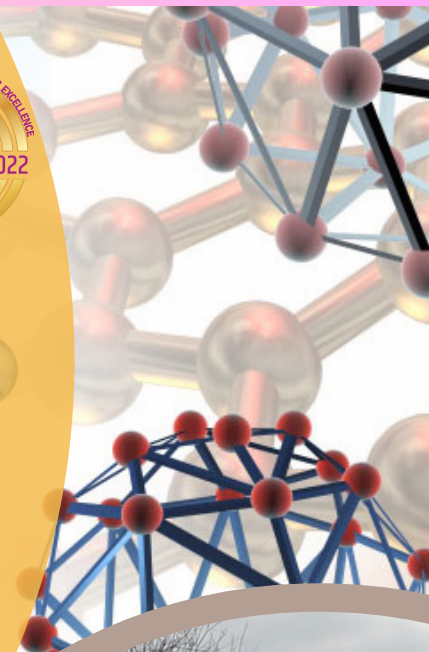
in 2nd International Conference on "Recent Advances in Functional Materials" (RAFM-2024) organised by Department of Physics under the aegis of IQAC ARSD College, University of Delhi & DBT (GoI) Star College during March 14-16, 2024 via online mode.

Dr. Manish Kumar
Convener, RAFM-2024

Prof. Vinita Tuli
Coordinator, IQAC

Prof. Gyantosh Kumar Jha
Principal, ARSD College





Online

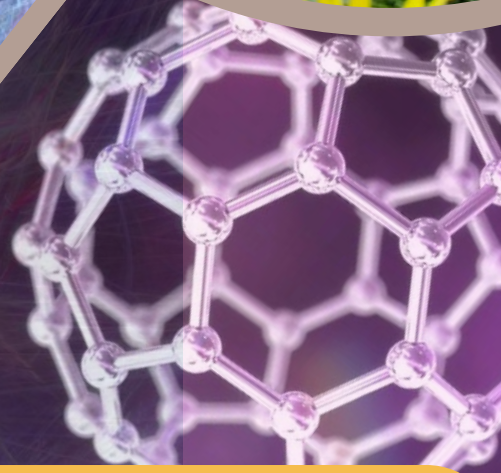
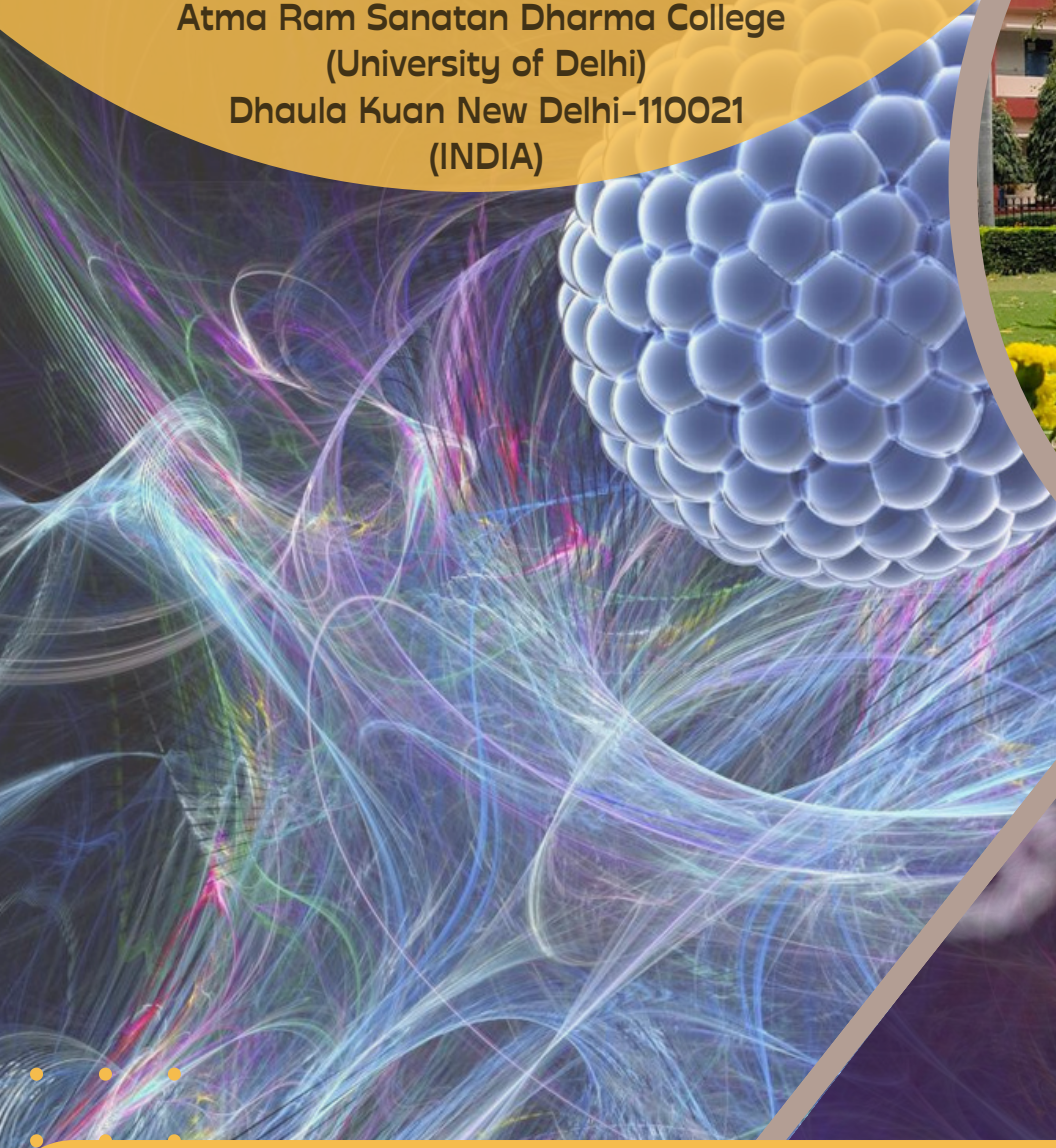
2nd International Conference on

Recent Advances in Functional Materials

(RAFM-2024) Abstract Book
(March 14-16, 2024)

Organized by

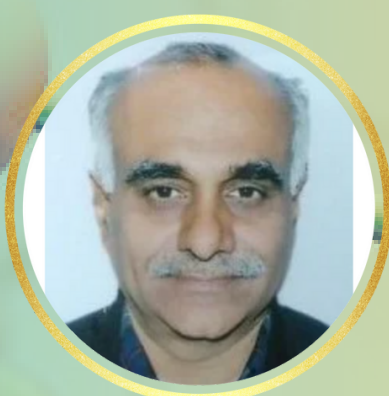
Department of Physics, IQAC & DBT Star College Scheme
Atma Ram Sanatan Dharma College
(University of Delhi)
Dhaura Kuan New Delhi-110021
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- Dr. Avneesh Anshul, NEERI-CSIR, Nagpur, India
- Dr. Subhash Sharma, CONACyT, Mexico
- Dr. Dharm Veer Singh, GLA University, India
- Dr. Mohit Kumar, Ajou University, South Korea



Tentative Program Schedule 2nd International Conference on Recent Advances in Functional Materials (RAFM-2024) 14-16th March, 2024



Day 1 (RAFM-2024) March 14, 2024

Timing (Indian Standard Time)	Event						Total time
08:20 AM - 09:00 AM	Welcome & Opening Remarks: Dr. Manish Kumar, Convener, RAFM-2024						40 minutes
	About Department of Physics: Dr. Rakesh Malik, TIC, Department of Physics, ARSD College						
	About IQAC: Prof. Vinita Tuli, IQAC Coordinator, ARSD College						
	Welcome Address: Prof. Gyantosh Kr. Jha, Principal, ARSD College						
	Address by Chief Guest, Prof. Bhartendu Kumar Singh, Director, PDPM IITDM Jabalpur						
Guest of Honour: Shri. Pawan Jaggi, Chairman, Governing Body, ARSD College							
09:00 AM - 09:30 AM	Keynote Lecture: Prof. Jonathan Guerrero Sanchez, Centro de Nanociencias y Nanotecnología, Universidad Nacional Autónoma de México, Mexico						30 minutes
09:30 AM - 10:00 AM	PL-1: Prof. R. K. Kotnala, CSIR NPL, New Delhi, India						30 minutes
10:00 AM - 10:30 AM	PL-2: Prof. Devendra Kumar, Department of Ceramic Engineering, IIT(BHU), Varanasi						30 minutes
Timings	Session 1 (Invited Talks) (Session Chair: Dr. Manisha Upadhyay and Dr. Asheesh Kumar) Moderator: Ms. Khushboo Gupta		Session 2 (Invited Talks) (Session Chair: Dr. Raghvendra Pandey and Dr. Devendra Kr. Rana) Moderator: Ms. Meena Devi		Session 3 (Invited Talks) (Session Chair: Dr. Anjani Kr. Singh and Dr. Subhash Sharma) Moderator: Mr. Manish Kumar		30 minutes
10:30 AM - 11:00 AM	IT-1	Dr. Victor E. Alvarez Montaña,	IT-4	Prof. Prashant Singh	IT-7	Prof. Sanket Goel	30 minutes
11:00 AM - 11:30 AM	IT-2	Dr. Mohit Kumar	IT-5	Prof. Beer Pal Singh	IT-8	Prof. Neelam Srivastava	30 minutes
11:30 AM - 12:00 PM	IT-3	Prof. Udai P. Singh	IT-6	Prof. P. K. Singh	IT-9	Dr. I. M. Noor	30 minutes
(Oral Presentations)							

12:00 PM - 12:10 PM	OT-1	OT-10	OT-19	10 minutes			
12:10 PM - 12:20 PM	OT-2	OT-11	OT-20	10 minutes			
12:20 PM - 12:30 PM	OT-3	OT-12	OT-21	10 minutes			
12:30 PM - 12:40 PM	OT-4	OT-13	OT-22	10 minutes			
12:40 PM - 12:50 PM	OT-5	OT-14	OT-23	10 minutes			
12:50 PM - 01:00 PM	OT-6	OT-15	OT-24	10 minutes			
01:00 PM - 01:10 PM	OT-7	OT-16	OT-25	10 minutes			
01:10 PM - 01:20 PM	OT-8	OT-17	OT-26	10 minutes			
01:20 PM - 01:30 PM	OT-9	OT-18	OT-27	10 minutes			
Lunch Break 01:30 PM - 02:00 PM							
Timings	Session 1 (Invited Talks) (Session Chair: Dr. Abid Hussain and Dr. Abhishek Singh) Moderator: Mr. Amit Singh Negi		Session 2 (Invited Talks) (Session Chair: Dr. Avneesh P. Singh and Dr. Manvendra Singh) Moderator: Ms. Heera Tariq		Session 3 (Invited Talks) (Session Chair: Dr. Bhupendra Singh and Dr. Upendra Kumar) Moderator: Ms Anuja Dhingra	Total time	
02:00 PM - 02:30 PM	IT-10	Prof. Vinod Singh	IT-13	Dr. Patrizia Bocchetta	IT-16	Dr. Thanos Tiliakos	30 minutes
02:30 PM - 03:00 PM	IT-11	Prof. Rajesh Kumar	IT-14	Dr. Sivaiah Bathula	IT-17	Prof. Sunita Bhagat	30 minutes
03:00 PM - 03:30 PM	IT-12	Prof. Monika Tomar	IT-15	Dr. Avneesh Anshul	IT-18	Prof. R. K. Dwivedi	30 minutes
(Oral Presentations)							
03:30 PM - 03:40 PM	OT-28	OT-40	OT-52	10 minutes			
03:40 PM - 03:50 PM	OT-29	OT-41	OT-53	10 minutes			
03:50 PM - 04:00 PM	OT-30	OT-42	OT-54	10 minutes			
04:00 PM - 04:10 PM	OT-31	OT-43	OT-55	10 minutes			
04:10 PM - 04:20 PM	OT-32	OT-44	OT-56	10 minutes			
04:20 PM - 04:30 PM	OT-33	OT-45	OT-57	10 minutes			
04:30 PM - 04:40 PM	OT-34	OT-46	OT-58	10 minutes			
04:40 PM - 04:50 PM	OT-35	OT-47	OT-59	10 minutes			
04:50 PM - 05:00 PM	OT-36	OT-48	OT-60	10 minutes			

05:00 PM - 05:10 PM	OT-37	OT-49	OT-61	10 minutes			
05:10 PM - 05:20 PM	OT-38	OT-50	OT-62	10 minutes			
05:20 PM - 05:30 PM	OT-39	OT-51	OT-63	10 minutes			
Day 2 (RAFM-2024) March 15, 2024							
Timing(Indian Standard Time)	Event			Total time			
09:00 AM - 09:30 AM	PL-3: Prof. O. P. Thakur, NSUT, New Delhi, India			30 minutes			
Timings	Session 1 (Invited Talks) (Session Chair: Dr. Yogesh Kumar and Dr. Suraj Prakash) Moderator: Ms. Vidhi Kundu	Session 2 (Invited Talks) (Session Chair: Prof. Prashant Singh and Dr. Prashant Kumar) Moderator: Ms. Meena Devi		Session 3 (Invited Talks) (Session Chair: Dr. Vishal Chaudhary and Dr. P. C. Sati) Moderator: Mr. Manish Kumar	Total time		
09:30 AM - 10:00 AM	IT-19	Dr. Kaushal Jha	IT-24	Dr. G. D. Dwivedi	IT-29	Dr. Arvind Kumar	30 minutes
10:00 AM - 10:30 AM	IT-20	Dr. Piyali Maity	IT-25	Dr. Subhash Sharma	IT-30	Dr. Deepak Kumar	30 minutes
10:30 AM - 11:00 AM	IT-21	Dr. Vivek Shukla	IT-26	Dr. Ziaul Raza Khan	IT-31	Dr. Pallav Gupta	30 minutes
11:00 AM - 11:30 AM	IT-22	Dr. Deepak K Dubey	IT-27	Dr. Dharm Veer Singh	IT-32	Dr. Than Singh Saini	30 minutes
11:30 AM - 12:00 PM	IT-23	Prof. Manish Kumar	IT-28	Dr. Parvendra Kumar	IT-33	Dr. Anshuman Srivastava	30 minutes
(Oral Presentations)							
12:00 PM - 12:10 PM	OT-64	OT-73	OT-82	10 minutes			
12:10 PM - 12:20 PM	OT-65	OT-74	OT-83	10 minutes			
12:20 PM - 12:30 PM	OT-66	OT-75	OT-84	10 minutes			
12:30 PM - 12:40 PM	OT-67	OT-76	OT-85	10 minutes			
12:40 PM - 12:50 PM	OT-68	OT-77	OT-86	10 minutes			
12:50 PM - 01:00 PM	OT-69	OT-78	OT-87	10 minutes			
01:00 PM - 01:10 PM	OT-70	OT-79	OT-88	10 minutes			
01:10 PM - 01:20 PM	OT-71	OT-80	OT-89	10 minutes			
01:20 PM - 01:30 PM	OT-72	OT-81	OT-90	10 minutes			

Lunch Break 01:30 PM - 02:00 PM

Timings	Session 1 (Invited Talks) (Session Chair: Prof. Manish Kumar, Dr. Anshuman Srivastava and Dr. Piyali Maity) Moderator: Mr. Atish Kr. Sharma		Session 2 (Invited Talks) (Session Chair: Dr. Than Singh Saini and Dr. Pravendra Kumar) Moderator: Mr. Rakesh Kumar		Session 3 (Invited Talks)(Session Chair: Dr. Deepak Kumar and Dr. Ajay Kumar) Moderator: Mr. Amit Singh Negi		Total time	
02:00 PM - 02:30 PM	PL-4: Prof. Amita Chandra, Department of Physics and Astrophysics University of Delhi, Delhi-110 007, India							30 minutes
02:30 PM - 03:00 PM	PL-5: Prof. Jelena Petrović, Institute for Technology of Nuclear and Other Mineral Raw Materials, 86 Franchet d'Esperey St., 11000 Belgrade, Serbia							30 minutes
03:00 PM - 03:30 PM	IT-34	Dr. Vishal Chaudhary	IT-35	Dr. Ritesh Kumar Chaurasia	IT-36	Dr. Prashant Kumar	30 minutes	
(Oral Presentations)								
03:30 PM - 03:40 PM	OT-91		OT-103		OT-115		10 minutes	
03:40 PM - 03:50 PM	OT-92		OT-104		OT-116		10 minutes	
03:50 PM - 04:00 PM	OT-93		OT-105		OT-117		10 minutes	
04:00 PM - 04:10 PM	OT-94		OT-106		OT-118		10 minutes	
04:10 PM - 04:20 PM	OT-95		OT-107		OT-119		10 minutes	
04:20 PM - 04:30 PM	OT-96		OT-108		OT-120		10 minutes	
04:30 PM - 04:40 PM	OT-97		OT-109		OT-121		10 minutes	
04:40 PM - 04:50 PM	OT-98		OT-110		OT-122		10 minutes	
04:50 PM - 05:00 PM	OT-99		OT-111		OT-123		10 minutes	
05:00 PM - 05:10 PM	OT-100		OT-112		OT-124		10 minutes	
05:10 PM - 05:20 PM	OT-101		OT-113		OT-125		10 minutes	
05:20 PM - 05:30 PM	OT-102		OT-114		OT-126		10 minutes	
Day 3 (RAFM-2024) March 16, 2024								
Timing(Indian Standard Time)	Event						Total time	
09:00 AM - 09:30 AM	PL-6: Prof. Sevi Murugavel, Department of Physics and Astrophysics, University of Delhi, Delhi 110 007, India						30 minutes	

Timings	Session 1 (Invited Talks) (Session Chair: Dr. Mohit Kumar and Dr. Mohd. Sadiq) Moderator: Ms. Khushboo Gupta		Session 2 (Invited Talks) (Session Chair: Dr. Arvind Kumar and Dr. Pallav Gupta) Moderator: Ms. Vidhi Kundu		Session 3 (Invited Talks) (Session Chair: Dr. Ritesh Kumar Chaurasia and Dr. Vivek Shukla) Moderator: Ms. Anuja Dhingra		Total time
09:30 AM - 10:00 AM	IT-37	Dr. Krishna Kumar Pandey	IT-41	Dr. Ofelia del Carmen Hernández Negrete	IT-45	Prof. Ram Mohan Mehra	30 minutes
10:00 AM - 10:30 AM	IT-38	Dr. Mohit Kumar	IT-42	Prof. Aranya Bhuti Bhattacharjee	IT-46	Dr. Nitesh Kumar Chourasia	30 minutes
10:30 AM - 11:00 AM	IT-39	Dr. Samiksha Dabas	IT-43	Dr. Asheesh Kumar	IT-47	Dr. Upendra Kumar	30 minutes
11:00 AM - 11:30 AM	IT-40	Dr. Prakash C Sati	IT-44	Dr. Suraj Prakash	IT-48	Dr. Abhishek Singh	30 minutes
(Oral Presentations)							
11:30 AM - 11:40 PM		OT-127		OT-140		OT-153	10 minutes
11:40 AM - 11:50 PM		OT-128		OT-141		OT-154	10 minutes
11:40 AM - 11:50 PM		OT-129		OT-142		OT-155	10 minutes
11:50 AM - 12:00 PM		OT-130		OT-143		OT-156	10 minutes
12:00 PM - 12:10 PM		OT-131		OT-144		OT-157	10 minutes
12:10 PM - 12:20 PM		OT-132		OT-145		OT-158	10 minutes
12:20 PM - 12:30 PM		OT-133		OT-146		OT-159	10 minutes
12:30 PM - 12:40 PM		OT-134		OT-147		OT-160	10 minutes
12:40 PM - 12:50 PM		OT-135		OT-148		OT-161	10 minutes
12:50 PM - 01:00 PM		OT-136		OT-149		OT-162	10 minutes
01:00 PM - 01:10 PM		OT-137		OT-150		OT-163	10 minutes
01:10 PM - 01:20 PM		OT-138		OT-151		OT-164	10 minutes
01:20 PM - 01:30 PM		OT-139		OT-152		OT-165	10 minutes
Lunch Break 01:30 PM - 02:00 PM							

Timings	Session 1 (Invited Talks) (Session Chair: Dr. Rita Singh and Dr. Ankita Srivastava) Moderator: Ms. Hera Tariq		Session 2 (Invited Talks) (Session Chair: Dr. I. M. Noor and Dr. Samiksha Dabas) Moderator: Mr. Atish Kr. Sharma		Session 3 (Invited Talks) (Session Chair: Dr. Rakesh Malik and Dr. Rajveer Singh) Moderator: Mr. Rakesh Kr. Sharma		Total time
02:00 PM - 02:30 PM	PL-7: Prof. Anup K. Ghosh, Materials Research Laboratory, Department of Physics, Banaras Hindu University, Varanasi-221 005, India.						30 minutes
02:30 PM - 03:00 PM	IT-49	Dr. Manvandra Kumar Singh	IT-50	Dr. Meenal Gupta	IT-51	Dr. Ftema Aldbea	30 minutes
(Oral Presentations)							
03:00 PM - 03:10 PM	OT-166		OT-178		OT-190		10 minutes
03:10 PM - 03:20 PM	OT-167		OT-179		OT-191		10 minutes
03:20 PM - 03:30 PM	OT-168		OT-180		OT-192		10 minutes
03:30 PM - 03:40 PM	OT-169		OT-181		OT-193		10 minutes
03:40 PM - 03:50 PM	OT-170		OT-182		OT-194		10 minutes
03:50 PM - 04:00 PM	OT-171		OT-183		OT-195		10 minutes
04:00 PM - 04:10 PM	OT-172		OT-184		OT-196		10 minutes
04:10 PM - 04:20 PM	OT-173		OT-185		OT-197		10 minutes
04:20 PM - 04:30 PM	OT-174		OT-186		OT-198		10 minutes
04:30 PM - 04:40 PM	OT-175		OT-187		OT-199		10 minutes
04:40 PM - 04:50 PM	OT-176		OT-188		OT-200		10 minutes
04:50 PM - 05:00 PM	OT-177		OT-189		OT-201		10 minutes
04:50 PM - 05:30 PM	VALEDICTORY FUNCTION						40 minutes

Keynote/Plenary/Invited Talk

Code	Name	Affiliation	Topic
Keynote	Jonathan Guerrero Sanchez	Centro de Nanociencias y Nanotecnología, UNAM, Mexico	Oxidation patterns and charge density asymmetry in transition metal dichalcogenides
Plenary Lecture			
Code	Name	Affiliation	Topic
PL-1	Prof. R. K. Kotnala	NPL, New Delhi, India	Hydrogen & Circular Economy Inevitable to Do Away Global Warming by Using Hydroelectric Cell !
PL-2	Prof. Devendra Kumar	IIT(BHU), Varanasi, India	Exploring the Materials World: Indian and Western Perspective
PL-3	Prof. O. P. Thakur	NSUT, New Delhi, India	Metal-Oxide/Ferrite-based Materials for Gas Sensing and Hydroelectric Cell Applications
PL-4	Prof. Amita Chandra	Delhi University, India	POLYMER ELECTROLYTE COMPOSITES AS EMI SHIELD
PL-5	Dr. Jaleena Patrovic	Institute for Technology of Nuclear and Other Mineral Raw Materials, Serbia	Hydrochars as novel functionalized materials for heavy metals removal
PL-6	Prof. Sevi Murugavel	Delhi University, India	Unravelling Structural Implications on Charge Transport Mechanism in Nanostructured Electrode Materials for Energy Storage Devices
PL-7	Prof. A. K. Ghosh	BHU, Varanasi, India	0D and 2D materials: Physical Properties to Device Applications
Invited Talk			
	Name	Affiliation	Topic
IT-1	Dr. Victor E. Alvarez Montaña,	Dra. Ofelia del Carmen Hernández Negrete,	DESIGN OF NEW HIGH ENTROPY CERAMICS WITH A FOCUS ON LAYERED CRYSTAL STRUCTURES
IT-2	Dr. Mohit Kumar	Ajou University, South Korea	Redox Thin Film Transistors for Energy-Efficient Logic-in Memory and Neuromorphic Computing
IT-3	Prof. Udai P. Singh	KIIT, India	Advances in Kesterite based thin film solar cells and Future Ahead
IT-4	Prof. Prashant Singh	Delhi University, India	DFT computations and MD Simulations of functionalized Graphene in sensing of small molecules
IT-5	Prof. Beer Pal Singh	CCS University, Meerut, India	Sputtered Deposited Semiconducting Nanostructures Thin Films for Gas Sensing and Optoelectronic Applications
IT-6	Prof. P. K. Singh	Sharda University, Gr. Noida, India	Two Needs with One Deed: Efficient Supercapacitor and Dye-Sensitized Solar Cells using Waste derived Activated Carbons and Ionic Liquid Doped Polymer Electrolyte
IT-7	Prof. Sanket Goel	BITS, Hyderabad, India	Portable Optofluidic devices for Autonomous and Diversified Sensing Applications: Cyber Physical System Approach
IT-8	Prof. Neelam Srivastava	MMV, BHU, Varanasi, India	Changing Trends in Polymer Electrolytes
IT-9	Dr. I. M. Noor	University Putra, Malaysia	Gellan Gum-Lithium bis(oxalate)borate Gel Polymer Electrolyte for Potential Application in Lithium-Ion Batteries
IT-10	Prof. Vinod Singh	DTU, New Delhi, India	Size Selected Nanoparticles: Gas Phase Synthesis and Sensing Application
IT-11	Prof. Rajesh Kumar	Guru Gobind Singh Indraprastha University, New Delhi, India	Radiation Induced Modifications in Engineering Polymers/SSNTDs by PALS and Their Potential Applications

PL-5

Hydrochars as novel functionalized materials for heavy metals removal

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Abstract

Untreated industrial effluent is causing alarming levels of water pollution in our modern world. Hydrochars, functional carbonaceous materials obtained during the hydrothermal carbonization of waste biomass, possess a great potential for use in industrial wastewater treatment. Their high reactivity and regenerative properties compensate its deficiency, which is reflected in a small specific surface area. In addition, these materials are amenable to additional functionalization and modification by various chemical treatments. Previous studies have demonstrated that incorporating metals onto the surface of hydrochar or treating it with hydrogen peroxide or alkalis can significantly enhance its adsorption capabilities. This paper provides a brief overview of using hydrochars from various sources as adsorbents for heavy metals. This review aims to assess the impact of material modification on its structural characteristics and sorption capacity.

Keywords: hydrothermal carbonization, hydrochar, heavy metal removal, wastewater purification.

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