

CHEMICAL

Warta



This issue is being published to Celebrate
98th Foundation Day of ICS

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9th May
2021

Presidential Address

Prof. G.D. Yadav
President
Indian Chemical Society
e-mail: gdyadav@gmail.com



Dear Readers,

At the very outset myself, Prof. G. D. Yadav, President of the Indian Chemical Society welcomed everybody present at the National Science Day Celebration virtual podium. During the pandemic period the Society has undertaken different academic activities including Students Science Competition, international and national seminars, Research Scholars competition etc.

One of the most important things which is going to change the face of the Society is the publication of the Journal of the Indian Chemical Society which is published by renowned publisher the Elsevier from January, 2021. Some new guidelines of fellowship have been defined. Step has been taken to create a new category of life membership as every member cannot be a fellow of this Society. Student memberships are there for graduate students, post graduates and Ph.D. students with onetime fee of Rs. 500/-. Institutional Membership and Corporate Membership also have been created this time. As the President of the Society, I appeal to all colleagues to take initiative for making Institutional or Corporate Membership to help the Society.

As you know, Chemistry is the central science; it serves the growth of Physics, Biology, Geology, Geography, Mathematics, Engineering Science & Technology, Pharmacy, Animal Science, Agriculture, Commerce & Business, Forensic, Law and there is nothing in this world which does not use chemicals. Everything is prepared using chemicals. So chemical industries are the critical part of our life and nation at large. So, chemistry is increasingly shifting from structure, function and chemist need to develop better strategies to efficiently generate molecules and systems of molecules with desired properties, be that physical, chemical or biological. These are required to meet the needs of our society.

Pandemic gave us a new opportunity to communicate virtually and this is the way of new life and how we have accepted it. With these few words I want to welcome all of you. Thank you very much and I wish a grand success of the program.

Yours sincerely,

G.D. Yadav

Address of the Honorary Secretary

Prof. Chittaranjan Sinha
Honorary Secretary
Indian Chemical Society
e-mail: crsjuchem@gmail.com



Dear Readers:

I am indeed happy to proclaim that the Indian Chemical Society is going to publish the second issue of Chemical Warta, May 2021.

In order to promote the chemistry education and modern research, the Indian Chemical Society was established in May 9, 1924 with the leadership of Acharya P. C. Ray as the first President along with other members such as Professor J. C. Ghosh, Professor J. N. Mukherjee, Professor S. S. Bhatnagar, Professor N. R. Dhar and many more distinguished personalities in the field of Chemistry of that time including few European scientists. Since that time, the Society has been publishing the Journal of Indian Chemical Society to disseminate the knowledge of chemistry to the global community. The Council of the Society felt to publish a news bulletin of the Society to inform the scientific community, the regular activity of the Society and with the inspiration of present President, Padma Shri Prof. G. D. Yadav the Society has started to publish 'Chemical Warta' on and from February, 2020.

The present issue consists of reports on National Science Day 2021. The celebration was held on February 28 and March 01, 2021 jointly with the Department of Chemistry, Jadavpur University. Theme topic was "Science for Sustainable Development". The Science Day was celebrated by organizing competitions of Speech, Poster, Model, and Essay amongst School children and College/University students. This programme was inaugurated by Prof. G. D. Yadav, President, Indian Chemical Society. The Keynote address was delivered by Dr. T. Ramasamy, Former Secretary, DST, Government of India. Prof. D. C. Mukherjee introduced the importance of Science Day. Prof. Uday Maitra, Indian Institute of Science, Bangalore delivered the popular Lecture on "Chemistry is Everywhere!".

A National Seminar was also organized on March 01, 2021 on "Material Chemistry – Today & Tomorrow". Prof. Ashok K Ganguly, Former Director, INST, Chandigarh & Professor, IIT, Delhi inaugurated the Seminar and Prof. Dipankar Mandal, INST, Prof. Abhishek Dey, IACS, Kolkata delivered Invited Talks. Young researchers and other dignitaries presented their research works on this platform.

You will be pleased to know that the Indian Chemical Society is going to celebrate the 160th Birth Anniversary of Acharya Prafulla Chandra Ray, the doyen of chemical sciences in India by organising Students' competition (from Class V to Post Graduate and Research Scholars) followed by International Seminar during August 01 to 08, 2021.



Editorial-

Dear Colleagues,

Last one year we are passing through tough time because of Covid-19, and probably we are in the approach of its 3rd wave. The light of hope is that Indian Scientists are playing a major role to combat with the situation starting from HCQ to Covaxin and Covishield. Our researchers have proved themselves in establishing new vaccine by their own technology. But due to the terrible effect of this virus our daily activities been disturbed and scientific activity is not outside the periphery of it. But with the collective leadership, the Indian Chemical Society has been elevated its activity to a great extent with the greater contribution from faculties, scholars and students all over India and also from abroad.

National Science Day 2021, the yearly event of the Indian Chemical Society, had been organized on February 28 and March 01, 2021. National Seminar (webinar) was organized on “Material Chemistry- Today and Tomorrow” with the theme “Science for Sustainable Development”. The Science Day was celebrated by organizing competitions of Speech, Poster, Model, and Essay amongst School children and College/University students. This programme was inaugurated by Prof. G. D. Yadav, President, Indian Chemical Society. The Keynote address was delivered by Dr. T. Ramasamy, Former Secretary, DST, Government of India. Prof. D. C. Mukherjee introduced the importance of Science Day. Eminent scientists from different corner of India delivered lectures to the online audience. Brief report of the programme is depicted in this May issue of CHEMICAL WARTA along with the brief summary of Prof. Ramasamy’s talk. The abstracts of all invited talks along with the short bio sketches of the speakers also included in this issue.

The country’s oldest Chemistry research journal, Journal of The Indian Chemical Society (J. Indian Chem. Soc.) is now being published by the renowned publisher, Elsevier from January 2021 is already available online (<https://www.sciencedirect.com/journal/journal-of-the-indian-chemical-society/>). It publishes peer-reviewed research articles, reviews, notes and communications in the major areas of chemistry. The Chief Editor along with six sectional Editors are tirelessly working for the betterment of the journal with the help of 61 International Advisors. Professor D C Mukherjee Festschrift, the special issue to recognize the 60 years of teaching carrier of Prof. Mukherjee has been published in the May, 2021 issue of J. Indian. Chem. Soc. (JInCS) with the help of two guest editors Prof. S C Bhattacharya of Jadavpur University and Dr. Gourisankar Roymahapatra of Haldia Institute of Technology. Seventeen research group has contributed their article in this special issue and it is

now available online (<https://www.sciencedirect.com/journal/journal-of-the-indian-chemical-society/special-issue/107Z70VL4BS>). It is indeed the good news that Indian Chemical Society has decided to publish Professor Sadhan Basu Birth Centenary Special Issue of JInCS in July 2021. The society is going to celebrate 160th Birth anniversary of its founder president, Acharya P. C. Ray, the father of Indian Chemistry, on 1st to 8th August 2021, in the form of International Seminar RACMS-2021, SSM-2021, and YSC-2021 and selected contributory research articles will be published in Acharya P.C. Ray Birth Anniversary Issue of JInCS. The flyer of the programme is included in this issue for detail information to the participants. We have also included some upcoming programmes of our society along with other institutes and organizations for the visibility of our readers. Brief description of all back issues of JInCS (September- December, 2020) been included in this issue of CHEMICAL WARTA for the same purpose. We are thankful to Sri Biswarup Das, Education Officer, Digha Science Centre and National Science Camp for contributing a beautiful article entitled “Development of Scientific Skills Through Science Camps” which will be very much helpful to our school students and science teachers.

We are thankful to all the council members and office staff of the Indian Chemical Society for their cooperation and support to finalize this issue. Hope, like the previous issues, this will also bear interest to all readers. The Indian Chemical Society deeply mourns the sad demises of the Fellows of the Society in near past time.

Dr. Nibedita Chakrabarti
Editor

Dr. Gourisankar Roymahapatra
Editor

Prof. Chittaranjan Sinha
Editor in Chief



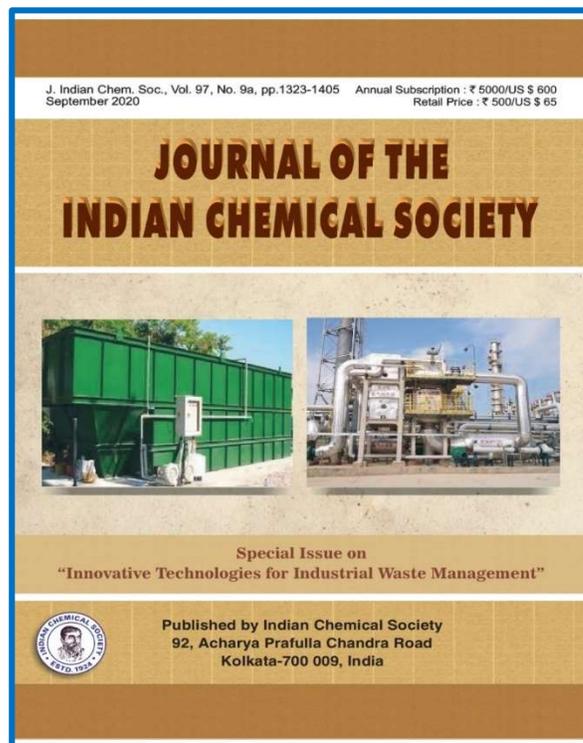
J. Indian Chem. Soc.

Vol. 97, No. 9a, September - 2020

Special Issue on “Innovative Technologies for Industrial Waste Management”

Industrial pollution is presently a matter of serious concern with the rise in production to meet a variety of demand from human civilization. The fast generation of pollutants in various mediums of the environment has been causing imbalance in ecosystem since last few decades. In view of that, efficient treatment and disposal through recycling and reuse have become inevitable for the present industries. In most cases, industries are not ready to adopt appropriate pollution control methods to avoid rise in production cost. A few industries are keen to implement their pollution control, provided a proven technological solution is there. They also demand cost-effective and advanced technology for abatement of pollution, which will function for a long run. The compatibility of various treatment and disposal techniques for wastewater, emission and solid wastes also vary depending on the production process and amount of pollution. Therefore, a comprehensive solution to individual industries should be developed addressing all types of pollution.

The Special Issue on “**INNOVATIVE TECHNOLOGIES FOR INDUSTRIAL WASTE MANAGEMENT**” is aimed to explore all the techno-economically viable advanced technologies in the field of industrial pollution control, which bring about high-rate treatment. Utmost care has been taken for publishing all the papers accurately as far as possible. Comments and suggestions regarding the quality of this Special Issue are always welcome from the readers. It will definitely help us to improve the quality of similar production in future. At the last but not the least, the editors would like to express their sincere thanks to all the authors in the present Special Issue for their valuable contribution. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.



The Indian Chemical Society has agreed to publish the above Special Issue in their esteemed journal J. Indian Chem. Soc.. We would like to extend our sincere thanks and gratitude to the Members of the Council of the Indian Chemical Society for their consideration of the proposal for publication of the aforesaid “**Special Issue**”. We cordially acknowledge with heartiest admiration the contribution of the Editorial Office of the Journal of Indian Chemical Society, to bring this issue into reality.

In spite of our best effort some inadvertent errors might have occurred, for which we tender our sincere apology.

We sincerely believe that this Special Issue would be gladly received by the scientific and engineering community and will definitely inspire us to bring more Special Issues in future.

Guest Editors:

Prof. Debabrata Mazumder, IEST Shibpur, Howrah

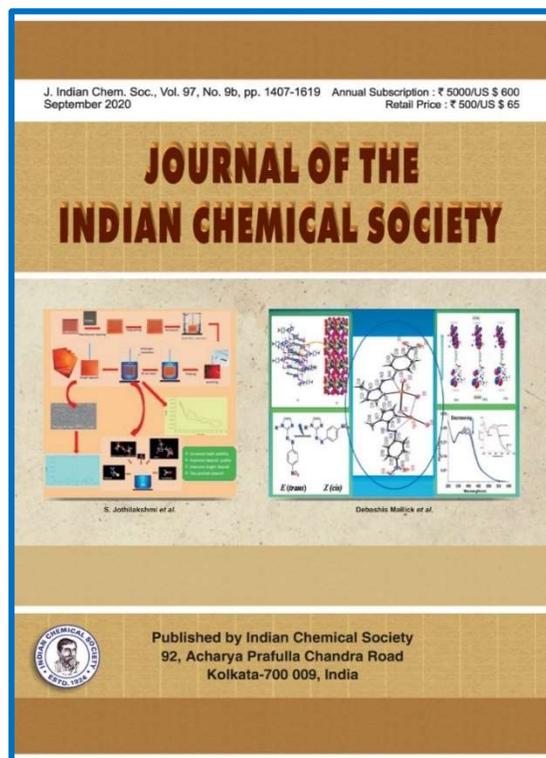
Prof. Chanchal Majumder, IEST Shibpur, Howrah

Prof. Asok Adak, IEST Shibpur, Howrah

**J. Indian Chem. Soc.
Vol. 97, No. 9b, September - 2020**

September B 2020 issue of the Journal of the Indian Chemical Society contains twentyseven original research articles in different section e.g. five review article, six articles in Inorganic Chemistry Section; three articles in Physical Chemistry Section, nine articles in Organic Chemistry Section and four articles in Analytical Chemistry of 213 pages.

Two cover page articles of this particular issue are role of additives on electroless copper methane sulphonate by S. Jothilakshmi et al from R and D section, Bharathiar University, Coimbatore, Tamilnadu and Structure and photochromism of halo-bridged dimeric mercury(II) complexes of 1-alkyl-2-(p-nitro-phenylazo)imidazoles by Debashis Mallick et al from Department of Chemistry, Mrinalini Datta Mahavidyapith, Kolkata. This issue is available (open accessed) in the Society



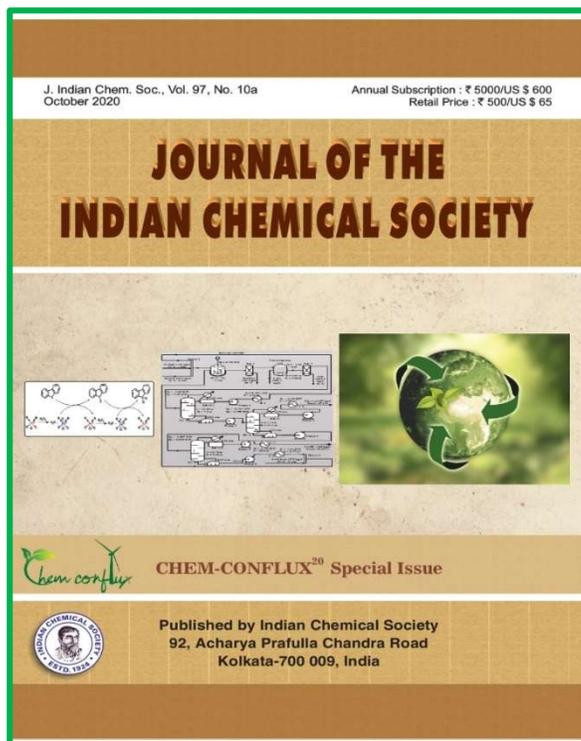
website www.indianchemicalsociety.com.

Rubaid Naskar et al., from Kolkata reported a review article on the fungal contamination and exposures in different water resources, hazards and remediation. Deepika Jain et al., from Punjab wrote a review paper on biosensors: an effective toxicity biomonitoring tool. Atiur Ahmed from West Bengal reported a review article on recent advances in the synthesis of indole and its analogs via C-H activation as a key step. Anushree Saha et al., from Chhattishgarh wrote a review article on the nano catalyst activity of polymeric resins. Pranabes Bhattacharyya from Kolkata wrote a short review on the biocatalysis: sustainable protocol in synthetic chemistry. Abul Kalam from Saudi Arabia investigated the In vitro antimicrobial activity of silver nanoparticle synthesized using Aster squamatus flower extract against selected pathogenic microbial. V. Yogeshwaran and A. K. Priya from Tamilnadu suggested the removal of hexavalent chromium concentration from the aqueous solution using chemically treated sugarcane bagasse powder. Ridhdi laiya et al., from Gujrat identified the inorganic constituents in urinary stones using powder-XRD, FT-IR, FE-SEM, EDX and HR-TEM and reported their structural characterization using powder-XRD data. Bhriguram Das et al., from West Bengal reported the Solvato(fluoro)chromism and investigated the quenching mechanism and thermodynamic binding parameter of two azine based chemosensor for Cu^{2+} ion and application in onsite detection. Mithun Kumar Ghosh et al., from Madhya Pradesh suggested the green synthesis, characterization and photocatalytic study of Cu based ZrO_2 nanoparticles. Srishti Kumawat et al., from Rajasthan reported the sonophotocatalytic degradation of fast green in aqueous phase using undoped and nitrogen doped ZnO. Suneel Kumar Dandabattina et al., from Andhra Pradesh investigated the in silico studies to understand the adsorbent properties of CuO nano-clusters for toxic water soluble dyes. Moemen Chira et al., from France reported a quick spectrophotometric methods for antioxidant capacity and phenolic compounds determination: different physico-chemical treatments of Chemlali olive paste. Dengping Hu et al., from China investigated the application, synthesis, isocyanate and polyol in underground seepage control engineering. Kamal A. Sweidan et al. from Jordan studied the synthesis, characterization and antimicrobial evaluation of some new substituted 1H-indole-2 carboxamide derivatives. Aparna Das et al., from KSA reported the quantum mechanical calculation of dipole moment of diverse imines. Aparna Das and Bimal Krishna Banik from KSA studied the dipole moment on α -hydroxy- β -lactam derivatives. Ravindra Singh Rao and Poonam Khandelwal from Rajasthan reported the isolation of pentonic acid-3-deoxy-4-lactone and peganine-N-oxide from Adhatoda vasica. K. Vijayalakshmi and J. Elangovan from Tamilnadu reposted the 1,2,3-Triazole derivative as a

potential protector for mild steel corrosion in acid media: a kinetic and thermodynamic approach. Sharulatha Venugopal et al., from Tamilnadu suggested the synthesis, characterization and molecular docking of N-aryl amides of pyrido[1,2-a]pyrimidin-2-ones as potential antibacterial agents. Ananda Sarkar et al., from Kolkata investigated the DFT based QSAR studies on 2-aziridinyl and 2,3-bis(aziridinyl)-1,4-naphthoquinonyl sulfonate and acylate derivatives as an anti-malarial agent. Subanti Das et al., from Tripura suggested the functionalization of silver nanoparticles with 1-naphthol-4-sulfonate for evaluation of ethylenediamine and diethylenetriamine. Sourav Majumder et al., from Bihar reported the powdered X-ray diffraction, FTIR, TGA and DTA studies of montmorillonite derivatives. Biswanath Biswas et al., from Kolkata investigated the effect of some micronutrients on the production of bioethanol from water hyacinth by *Saccharomyces cerevisiae* AB₈₁₀. T. Manikya Sastry and K. Rama Krishna from Andhra Pradesh determined and ACE inhibitor using extraction-spectrophotometric method with naphthol blue-black in formulations.

J. Indian Chem. Soc.
Vol. 97, No. 10a, October -2020
Special Issue on CHEM CONFLUX²⁰

With great pleasure, we publish this Special Issue in the Journal of the Indian Chemical Society. This issue contains the selected and peer-reviewed high-quality research articles submitted in **CHEM-CONFLUX²⁰** (An International Conference on Energy and Environmental Technologies for Sustainable Development), organized at the Motilal Nehru National Institute of Technology Allahabad during February 14-16, 2020. Amongst many submissions to **CHEM-CONFLUX²⁰**, authors of selected submissions were invited to submit the full papers based on the recommendations of the screening committee. The submitted full papers were peer-reviewed for their



merits. Our esteemed peer reviewers and editors have done a commendable job of successfully completing the task within a stipulated time with utmost proficiency. This Special Issue is aimed to compile the research outcomes of the leading researchers working in the area of energy and environmental technologies leading to sustainable development. Energy is essential to society and it has made a considerable impact on the environment as a consequence of the large scale and pervasive nature of energy related human activities. In view of these, this Special Issue is intended to provide a premier interdisciplinary platform for researchers, practitioners and educators to present the most recent innovations, trends, concerns, practical challenges, and the solutions adopted in the above fields and to enlighten the readers about the latest development of sustainable technologies related to the energy and environment. This issue focuses mainly on renewable and alternative energy/fuels, biomass utilization and bioenergy, water and wastewater treatment, energy integration and management, sustainable and green technologies and techno-economic feasibility. The contributors to this Special Issue are from several branches of engineering and science. We show our deepest gratitude to the authors for their valuable contributions. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.

We affably acknowledge with the heartiest appreciation the scholastic contribution of the authors. We hope that this issue of the Journal of the Indian Chemical Society will further sensitize the creative minds to focus their research endeavours towards the development of new technologies to promote sustainability. We are grateful to the reviewers, editors, publication team, organizing team, conference organizing committee team, advisory board members, and patrons who played their roles to make this happen in the scheduled timeframe. Last but not the least, we show our sincere appreciation for the Indian Chemical Society, Kolkata for continuous support and encouragement. It has been a wonderful experience to work with the Journal of the Indian Chemical Society.

Guest Editors:

Dr. Sushil Kumar, MNNIT Allahabad

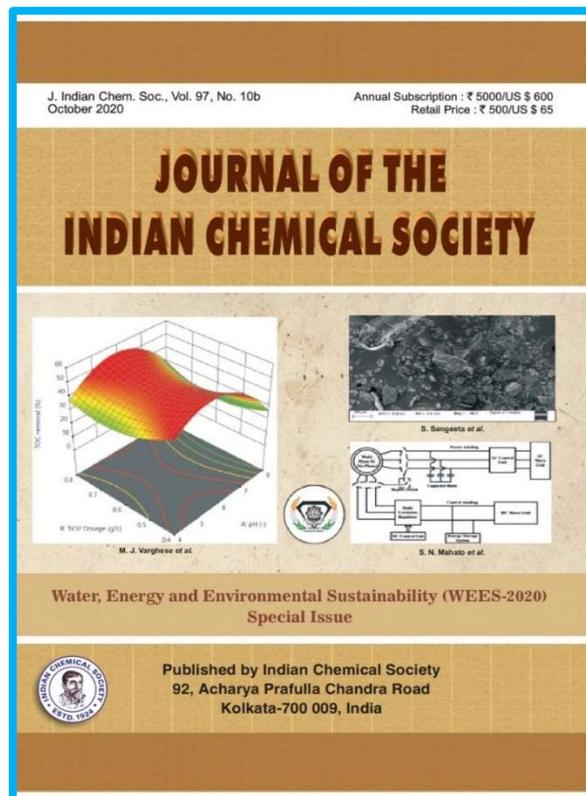
Dr. Dipesh S Patle, MNNIT Allahabad

Dr. Shivendu Ranjan, University of Johannesburg

J. Indian Chem. Soc,

Vol. 97, No. 10b, October, 2020
Special Issue on WEES-2020

Civilization now stands at the crossroads, faced as it is with grave challenges on the fronts of energy, water, and the environment. The modern industrialized and mechanized society has created a stress on three very important factors which are crucial for it to survive and thrive. These are energy, water, and the environment – three factors which do not stand in isolation but are in fact inter-connected. On the one hand, excessive consumption of fossil fuels is not only depleting fossil fuel reserves at an alarming pace but also resulting in pollution of the environment. This pollution of the atmosphere is causing global warming due to greenhouse gas emissions and rising temperatures and is also adversely affecting the water cycle. Consequences of this phenomenon is manifest in various ways such as melting glaciers, change in the form of precipitation, dry areas becoming drier and wet areas becoming wetter, etc. Coupled with this is consumption itself both of which together pose a stress on surface water as well as groundwater. Again, a broader view of environmental pollution necessitates the consideration of many aspects such as water pollution, soil contamination, plastic pollution, etc. in addition to atmospheric pollution mentioned above. All these kinds of pollution are posing a threat to the biosphere whose preservation is essential for the survival of the human species. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.



The present scenario urgently requires technologies and strategies for clean energy, water and environment that are free from greenhouse gases and hazards posing threats to the lives of future generations. Alternate energy sources which are clean and renewable must be explored. Technologies which essentially promote the judicious use and preservation of our precious water resources must be developed. In general, technology must now march ahead along the path of



environmental sustainability.

An International Conference on ‘**Water, Energy and Environmental Sustainability 2020**’ (**WEES-2020**) was organized by National Institute of Technology Durgapur (NIT Durgapur) in association with RMIT University Australia during January 13-15, 2020 at NIT Durgapur. The objective of **WEES-2020** was the sharing of knowledge and the dissemination of ideas on future technologies and strategies for developing technically and economically viable methods for conservation of water and energy resources, for development of alternate clean and renewable energy sources and for preventing and abatement of pollution. It is our proud privilege that the Indian Chemical Society, a premier scientific Society of India, established in 1924 with Acharya Prafulla Chandra Ray as its founding President, has agreed to dedicate one Special Issue of the Journal of the Indian Chemical Society for the above International Conference. We are honoured that the Special Issue (October 2020) is being published some selected and peer-reviewed full papers presented in the conference.

We are indebted to Professor Anupam Basu, Director, NIT Durgapur and to Professor Firoz Alam, RMIT University Australia, for their patronage and encouragement in organizing WEES-2020. We are grateful to the members of the Council of the Indian Chemical Society for their kind consideration of our proposal for publication of the Water, Energy and Environmental Sustainability (WEES-2020) Special Issue. We sincerely acknowledge the contribution and efforts of the authors for their articles.

We sincerely apologize for any inadvertent errors that might have crept in despite our best efforts. We hope that the scientific and engineering community will find the “WEES-2020 Special Issue” useful and will extend their support to us to bring out more such special issues in future.

Guest Editors:

Dr. Kalyan Adhikari, NIT Durgapur

Dr. Susmita Dutta, NIT Durgapur

Dr. Kaustav Aikat, NIT Durgapur

Dr. Rajnarayan Saha, NIT Durgapur

Dr. Tapas K Saha, NIT Durgapur

J. Indian Chem. Soc.
Vol. 97, No. 10c, October, 2020

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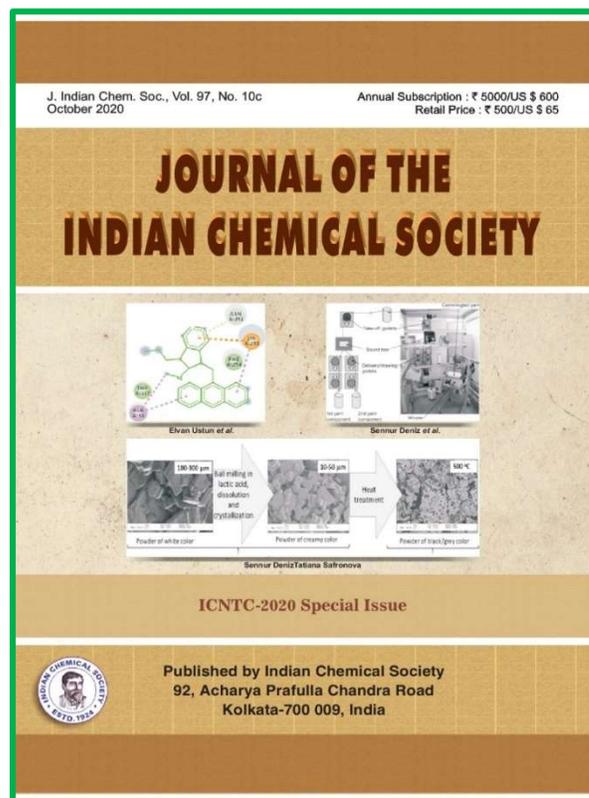
Special Issue on International Conference on New Trends in Chemistry - ICNTC-2020

This Special Issue of the Journal of the Indian Chemical Society is dedicated to New Trends in Chemistry as a subject and contains 27 selected papers based on the Oral Presentations in the 6th International Conference on New Trends in Chemistry organized virtually during October 17 and 18, 2020. The topics are Polymer Chemistry and Applications, Pharmaceutical Chemistry, Computational Chemistry, Environmental Chemistry, Biochemistry, Physical Chemistry, Analytical Chemistry, Organic Chemistry, Material Chemistry and Inorganic Chemistry. This conference has provided a common platform for scientists and experts from various institutions to exchange knowledge, ideas, and achievements to discuss impedance data analysis in a friendly environment. The symposium has been dedicated to recent developments in chemistry. We are indebted to Professor Dr. HuriyeIcil and Professor Dr. Mustafa Gazi, Eastern Mediterranean University, North Cyprus for their kind contribution as invited Speakers. We sincerely acknowledge the contributions and efforts of all the authors for their studies. We would like to express our sincere gratitude to all the authors and reviewers of the manuscripts and to the Editorial Team of the Journal of the Indian Chemical Society who have critically evaluated and improved the contents of the manuscripts. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.

Guest Editors:

Dr. Sameh Boudiba, Tebessa University, Algeria

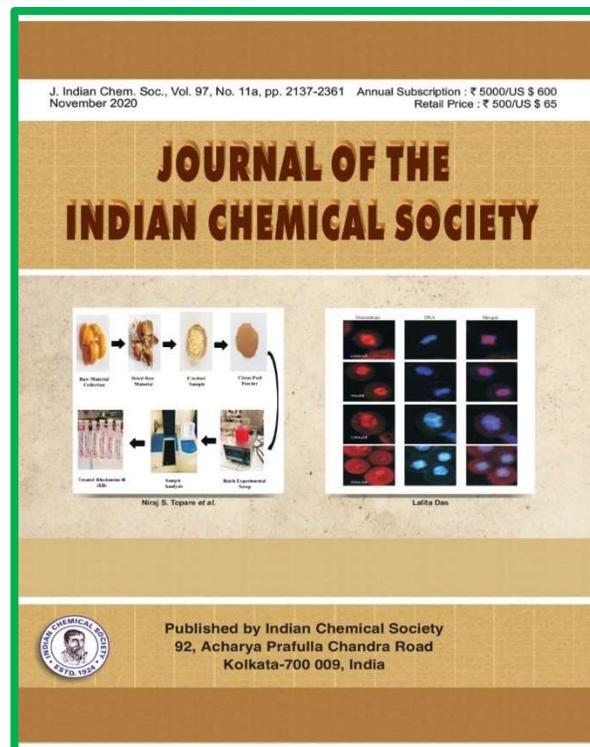
Dr. Dolunay Sakar Dasdan, Yildiz Technical University, Turkey



J. Indian Chem. Soc.
Vol. 97, No. 11a, November – 2020

November A, 2020 issue of the Journal of the Indian Chemical Society contains twenty eight original research articles in different section e.g. four articles in Inorganic Chemistry Section; eleven articles in Physical Chemistry Section, seven articles in Organic Chemistry Section; six article in Analytical Chemistry Sections of 225 pages.

Two cover page articles of this particular issue are Adsorption of Rhodamine-B by using Citrus peel powder: Influence of operating parameters by Niraj S. Topare et al from Department of Petrochemical Engineering, Maharashtra Institute of Technology, Puna and A mechanistic study of the binding of TN-16 to tubulin by Lalita Das from Department of Chemistry, Surendranath College, Kolkata. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.



Sekhar Gain from West Bengal studied the Oxidation of hydroxylamine by Co^{III} -bound superoxo complex containing chelating ancillary ligands: a kinetics and mechanistic study. I. Rama and R. Selvameena from Tamilnadu investigated the synthesis, characterization, redox behavior, antioxidant and antimicrobial activities of manganese(II), cobalt(II), nickel(II), copper(II) and zinc(II) complexes of sulfathiazole functionalised Schiff base. Ruhul A. Bepari from Assam reported the synthesis of hematite and maghemite nanocrystals from a single metal-organic precursor for catalytic use. Ratna Bandyopadhyay from West Bengal reposted the synthesis, characterization and use in catalytic oxidation reaction of Oxo-peroxo vanadates(V). Himadri Sekhar Das et al., from West Bengal suggested the effect of substrate and substrate temperature on microstructure of magnetron sputtering doped-ZnO thin films. Reena Kalal et al., from Rajasthan reported a a kinetic and mechanistic aspects for the selective oxidation of glycolic and lactic acids by benzimidazolium dichromate. Naorem Shubhaschandra Singh from Manipur did a rheological study on the Behaviour of hydroxy propyl cellulose (HPC) hydrogel in the presence of the SDS surfactant. Arkaja Goswami

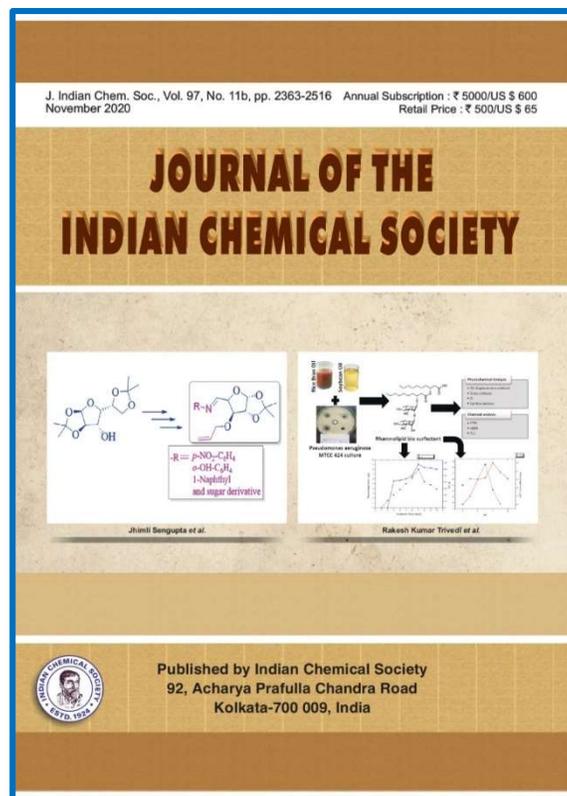
and Vinod Kumar Sharma from Delhi studied a corrosion inhibition of mild steel by hexyltriphenylphosphoniumbromide in acid medium. Yeliz Ipek from Turkey reported the Electrochemical behaviour of cross-linker glutaraldehyde as a receptor for carbaryl biosensor. J. Vijayaraghavan et al., from Tamilnadu reported the isotherm and kinetic modeling for the Sequestration of Pb(II), Ni(II) and Zn(II) biosorption onto brown seaweed *Sargassum wightii*. G. R. Dey from Mumbai did a pulse radiolysis study on radical cations and radicals of thiourea and its derivatives in n-butyl chloride solutions. Debabrata Pal from West Bengal wrote a short overview of Gemini surfactants. Nekram Rawal from Uttar Pradesh studied the effects on some crops growth under the tannery effluent. Mohammad Zakarianezhad et al., from Iran did a DFT study on the Mechanistic investigation of the addition-cyclization between diacylacetylene and thiourea. Swati Goyal and Rajeev Jain from Madhya Pradesh studied the heterogeneous photocatalytic degradation of pharmaceutical 5-HT receptor agonist rizatriptan benzoate using nanocrystalline TiO₂. A. Sheena Mohan et al., from Kerala reported the synthesis, crystal structure, spectral and antimicrobial studies of 4-(2,5-dimethoxybenzaldehyde)-2,3-dimethyl-1-phenyl-3-pyrazolin-5-one. Dibakar Roy et al., from West Bengal investigated the synthesis and evaluation of rice bran oil based copolymers as potential lube oil additives. Biswajit Panda from Kolkata reported the synthesis and of conjugated pyrrole based oligo-heteroaryls. Md. Firoj Hossain et al., from West Bengal investigated the recognition of monocarboxylic acids by imidazole based fluorescent receptors. Subrata Dasgupta et al., from West Bengal did a comparative theoretical investigation on the hydride transfer process of trans and gauche conformers of phenylethylamine and norepinephrine with lumiflavin. Sonia Singh et al., from Uttar Pradesh reported a correlation between in vitro antioxidant activity and GC-MS evaluation of *Calotropis gigantea* (L.) R.Br. root extract. Ahmad Al Khawaldeh and Mohammed Khair Hourani from Jordan suggested a electrochemical reduction from carbon dioxide to urea through the application of a polycrystalline palladium electrode potential Square Wave Regime. P. Harika et al., from Andhra Pradesh did a comparative analysis of nutritive and non-nutritive content of Shatavari – a commercial Indian herbal medicine. Uday Sankar Banerjee from China studied the mobility and ecological risk assessment of heavy metals in soils impacted by hazardous smelting waste. T. R. Thirumuruga Ponbhagavathi et al., from Haryana determined the HPLC of available lysine in milk protein-maize composite extrudates and its stability during storage. Saruchi et al., from Punjab investigated Colon targeting xanthan gum microspheres of mesalamine for the treatment of ulcerative colitis and its kinetics.

J. Indian Chem. Soc.
Vol. 97, No. 11b, November – 2020

November B 2020 issue of the Journal of the Indian Chemical Society contains eighteen original research articles in different section e.g. one article in Inorganic Chemistry Section; ten articles in Physical Chemistry Section, three articles in Organic Chemistry Section; three in Analytical Chemistry section and one article in Environmental Chemistry Sections of 153 pages.

Two cover page articles of this particular issue are Synthesis and characterization of new carbohydrate-based organic Schiff bases by Jhimli Sengupta and Nandagopal Hudait from Department of Chemistry, West Bengal State University, Barasat, Kolkata and A comparative study of biosurfactant preparation by *Pseudomonas aeruginosa* MTCC 424 using rice bran oil and soybean oil substrates by Ashutosh Mishraa and Rakesh Kumar Trivedi from Department of Chemical Engineering, Dr. Ambedkar Institute of Technology for Handicapped, Kanpur, Uttar Pradesh. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.

Anupama Srivastava et al., from Uttar Pradesh reported the synthesis, spectroscopic studies and biological aspects of bis(cyclopentadienyl)titanium(IV) complexes with 4-amino-5-(nicotinic/picolinic/isonicotinic/indole-3-propyl/indole-3-ethyl)-3-mercapto-1,2,4-triazole. Tarun Kumar Barik et al., from West Bengal wrote a brief review on the prospect of nanotechnology. N. Mohondas Singh et al., from Mizoram did a kinetic study for the interaction of Nd(III) with creatine in different organic solvents using 4f-4f transition spectra as a probe. Sandip Kumar Rajak from West Bengal reported a probing the reactive center for site selective protonation in carbonyl sulphide in terms of conceptual density functional based site selectivity descriptors. H. S. Chawda et al., from Rajasthan investigated the undoped and



carbon-doped calcium molybdate as photocatalyst for degradation of methylene blue. G. R. Dey et al., from Mumbai reported the benzene photo-mineralization in presence of metal ions in water containing suspended TiO₂ semiconductor. Vaneet Kumar et al., from Punjab did a thermo-acoustical study of silver nanoparticles in methanol and propanol in the temperature range 288.15 K–313.15 K. T. Manikanda Kumaran et al., from Tamilnadu investigated the influences of bath chemistry and complexing agent on plating rate in electroless copper methane sulphonate bath. Tanmoy Ghosh et al., from Kolkata reported a cyanide sensor using significant fluorescence intensity of excitation dependent emission at longer wavelength of graphite-ZnO nanocomposite in water. Niraj S. Topare et al., from Maharashtra did a comparative study of ultrasonic and conventional method for biodiesel production using different heterogeneous catalyst. Sanjib Kumar Maiti et al., from Kolkata studied the effect of some major operational and chemical parameters for the removal of total chromium from landfill leachate by electrocoagulation process using iron electrodes. Aparna Das and Bimal Krishna Banik from Saudia Arabia studied the geometry, dipole moment and anticancer activity of β -Lactams. Aparna Das from Saudia Arabia reported a quantitative structure-property relationships of Taxol, Taxotere and their epi-isomers. Nurcihan Tan-Erkoç et al., from Turkey reported the optimization of ultrasonic-assisted extraction of antioxidants from lemon peel waste using response surface methodology and multi-response desirability function. Shu-Lung Kuo and Edward Ming-Yang Wu from Taiwan did a analysis on certain physical and resourceful properties of kish graphite containing materials. Pratima Gajbhiye and Anand Mohan Yadav from Punjab investigated the industrial wastewater treatment using hybrid techniques and data modeling using RSM-ANOVA approach.

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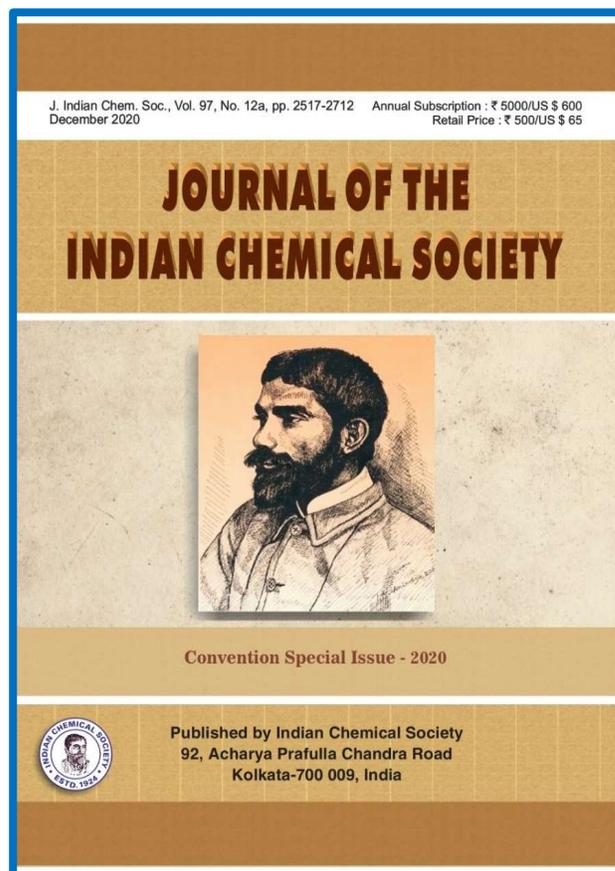
Special Issue on –

Annual Convention of Chemists-2020 (ACC-2020)

The Journal of the Indian Chemical Society, a Scopus Indexed (h-indexed, 31) abstracted in Chemical Abstract and enlisted in all leading Science Publishing Agencies, is publishing its 12th issue of Vol. 97, 2020 (December Issue) as Convention Special Issue. This publication comprises 19 original research articles and Reviews submitted by eminent chemists of the country. Endowment Awardees (2019) and some of the Invited Speakers attending the 57th Annual Convention of Chemists to be held during December 26-29, 2020 have submitted the full papers of their lectures. The cover page depicts the photograph of Acharya Prafulla Chandra Ray, the pioneer in foundation of Chemical Industries namely, Bengal Chemicals and Pharmaceuticals Works

in the then British ruled India in 1901, symbolising the dream of an individual entrepreneur for poverty alleviation and employment generation for his countrymen. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.

Finally, without the contributions from all the authors, this special issue would not have become a reality. We appreciate all the contributors to this issue.



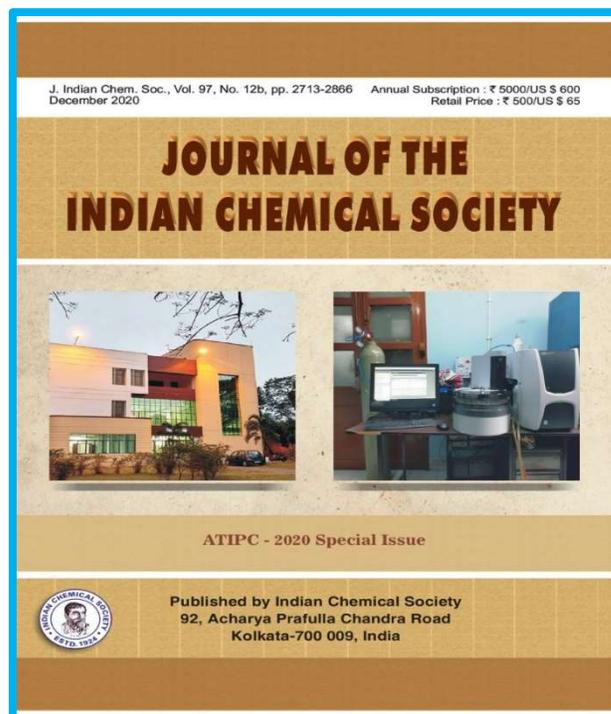
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Special Issue on ATIPC - 2020

The prevention and control of industrial pollution nowadays have been a great challenge for the survival of civilization. It not only causes deterioration in environmental quality but also imparts long and short term adverse effects on human health. In order to address these issues, a number of advanced technologies have been developed; but most of them are not approachable by the small and medium scale industries. Under this scenario, all the innovative technologies for industrial pollution control should be economically viable as well as easily maintainable. To disseminate the knowledge on this issue among the relevant communities, the Second Version of International Conference on **Advanced Technologies for Industrial Pollution Control (ATIPC – 2020)** was organized by the Department of Civil Engineering, Indian Institute of Engineering Science and Technology, Shibpur (IEST, Shibpur) during December 16–18, 2020 in online mode. A total 110 Nos. of Extended Abstracts were submitted in this conference, out of which 75 Nos. were selected for oral presentation. The Indian Chemical Society, a premier scientific organization, established by Acharya Prafulla Chandra Ray, has agreed to dedicate one Special Issue of its' journal for the above International Conference. It is our great pleasure that the Special Issue (December, No. 12b, 2020) has been published with some selected and peer-reviewed full-length papers, presented in the above conference. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.

We express our deep sense of gratitude to Professor Parthasarathi Chakrabarti, Director, IEST, Shibpur for his continuous encouragement in organizing ATIPC – 2020. We would like to extend our sincere thanks and indebtedness to the Members of the Council of the Indian Chemical Society for their consideration of the proposal for publication of the “ATIPC –2020 Special Issue”. We cordially acknowledge with heartiest admiration the scholastic contribution of the authors,



who kindly responded promptly with their articles.

In spite of our best effort some inadvertent errors might have occurred, for which we tender our sincere apology. We sincerely believe that the “ATIPC – 2020 Special Issue” would be gladly received by the scientific and engineering community and will definitely inspire us to bring more Special Issues in future.

Guest Editors:

Prof. Debabrata Mazumder, IEST Shibpur, Howrah

Prof. Chanchal Majumder, IEST Shibpur, Howrah

Prof. Asok Adak, IEST Shibpur, Howrah

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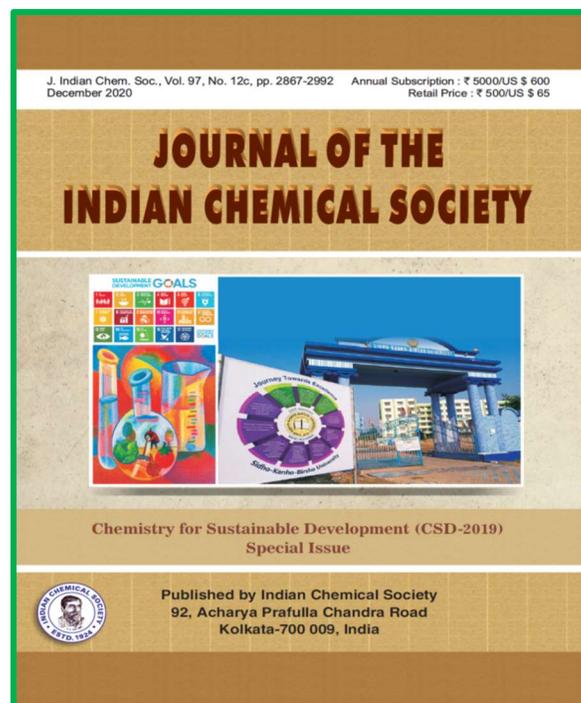
Vol. 97, No. 12 c, December – 2020

Special Issue on ‘Chemistry for Sustainable Development – 2020 (CSD-2020)’

The Department of Chemistry, Sidho-Kanho-Birsha University, Purulia, West Bengal, India organized a program for the Celebration of International Year of Periodic Table and National Conference on “Chemistry for Sustainable Development (CSD-2019)” on November 26-27, 2019 along with the commemoration of the life and achievement of Acharya P. C. Ray, the Father of Modern Indian Chemistry, philanthropist and entrepreneur who founded modern chemistry education and research in India. Indian Chemical Society supported this event to make the effort successful and agreed to publish selective and peer

reviewed research articles in the Journal of the Indian Chemical Society (JICS) in an Issue entitled, “Chemistry for Sustainable Development”.

The special issue of JICS entitled “**Chemistry for Sustainable Development - 2020**” aims to feature and address the societal challenges faced by India and the rest of the World by providing solution to major environmental problems, thereby contributing to achieving the UN’s 17 sustainable development goals (SDG). In this content, focus is made to address important issues in



Chemistry for the sake of Sustainable Development in various sectors such as energy, food and agriculture, health and hygiene, and many more. This Issue is intended to assist the students, researchers, and professionals mainly from academic institutions, scientific organizations, and industrial professionals who are involved in green chemistry and technologies for sustainable development with an emphasis on emerging trends in the major fields such as green catalysis, green solvents and reagents, green chemicals and energy produced from renewable resources, novel materials and technologies for energy production and storage etc. This issue is available (open accessed) in the Society website www.indianchemicalsociety.com.

Gold nanoparticles, chemical sensors, active functional materials for selective sensing of environmentally important analytes, graphene oxides, catalytic reduction of organic and inorganic compounds, energy storage materials, magnetic materials, nanotechnology in textile industries, photocatalysis, organic-inorganic polymer nanocomposites, water purification by nanofiltration, fluoride and fluorosis etc. are the major areas of discussion in this Special Issue. Environmental issues like indigenous vegetations and biodiversity, climate change and its health effect, bioremediation, plastic pollution and possible remediation are also discussed in this publication. Cytotoxicity and antiproliferation of hydro methanolic extract, biomethanol production from cellulose enzymatic hydrolysis, and fish scale mimicked hydrophobic modification on silk surface by polymerization process are covered in this special issue. Some fundamental aspects like facts and facets of Mandeleev's periodic table, chromium chemistry, chemistry of metal complexes, thermodynamics of amino acids in aqueous electrolytes, activity of natural radionuclides, etc. are also included in this publication.

We invite you to read this special issue on “Chemistry for Sustainable Development” and give your valued opinion for a better appreciation of the work achieved by our researchers from respective networks who contributed to this special issue. I must thank to our expert reviewers who have helped in selecting papers, and the professional work of the Editors of the Journal of the Indian Chemical Society in handling the manuscripts. We do hope this Special Issue will be inspiring to our readership and will help the Journal of the Indian Chemical Society continue to grow and improve to meet the societal demand of the country and the globe.

Guest Editors:

Dr. Jayanta Maity, Sidho-Kanho-Birsha University, Purulia

Dr. Debasis Dhak, Sidho-Kanho-Birsha University, Purulia

Development of Scientific Skills Through Science Camps

Biswarup Das *

Education Officer, Digha Science Centre and National Science Camp, Digha, West Bengal

National Council of Science Museums, Ministry of Culture, Government of India

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Schools, colleges, and other NGOs around the world organize science camps with a commitment to make students proficient and strong in science, technology, mechanics, and math. Like other camps, science camps are spending time with friends and strangers happily without books, homework, school and college exams and family members. The only difference, like the other camps, is that all types of students have the opportunity to experiment with science. In these camps, the real subject of science is known by having fun in the hands without any obstacles and doing some activities with pleasure with different equipment.

There are different types of science camps. The daily and residential science camps draw attention to real aspects of science and mechanics such as robotics, chemistry, environment, zoo animals, architecture, space science, and more. These camps help to understand science and mechanics concepts through fun and sports.

Why do we participate in science camps?

An effective method of fostering scientific temper in school and college student is to impart them knowledge of science through experimentation and demonstration, by involving them directly in activities similar to how the scientist did or do in inventing or discovering a certain aspect of science. As goes the Chinese proverb

*"I hear, and I forget
I see, and I remember
I do, and I understand."*

1. Science camps come under the umbrella of what we call home science education. Recently, it has been found that this home science education is very effective for students and the general public. Students who participate in these science camps have the opportunity to understand science and enter the science profession.
2. The science camp introduces the small school students to various branches of science which inspires and inspires confidence in their school science education. Older students who are interested in science can find specific science related professions or science instructors and role models of their choice through science camps. These opportunities help to create a well-organized life in the international arena or in the future school and college needs.
3. Science camps give all students an opportunity that they do not get in school, such as marine

biology and aviation.

The purpose of the science camp -

1. The main purpose is to describe in language where science, technology and art are applied in human welfare, to increase scientific attitude, to maintain scientific awareness among general students.
2. Increasing the popularity of science and technology among rural and urban students.
3. Science serves as a complement to students' activity-related questions and answers.

The goal of the science camp -

1. Opportunity for students to learn science in one place.
2. Opportunity to work hand in hand and real world learning experience.
3. To provide group based and collaborative education.
4. To develop science practice skills.
5. Enhancing Proper Development in Youth (PYD).
6. To increase the interest of students towards science and mathematics in high schools.
7. Increasing the interest of young students studying in different schools and colleges in the lesser representation of the competition to study different branches of science.

Benefits of science camp -

Through science camps, children or students live in a caring environment in the adult community where they receive empirical experimental education that results in self-esteem and character perfection in human quality. All results such as spirit, self-worth, self-esteem, leadership and self-esteem are created through proper evaluation of competition or personal competence. These own competitions or skills are reflected in the four camp groups - empathy, contribution, commitment and character. With the help of all these qualities to build a successful nation and civilized society. Here children have the opportunity to be in public with consciousness at very low risk, to have inter-productive relationships and to apply their own experience directly. Children grow up in a skilled care and proper environment in this camp where safety is a primary promise. Professional camps carry moments of general learning with great efficiency. Certain camp shots touch the moving experience by the human soul. These fast-paced moments create important values for students that acquire the right knowledge at the right time from the science camp.

In conclusion, the aim of the camps is to create curiosity and strong interest in the students through education activities related to science education and mechanics. The science camp provides students with an environment where science is taught through sports, fun and competition, matching explanations of various science phenomena and hands-on experiments.

National Science Day & National Seminar on “Material Chemistry- Today and Tomorrow”

National Science Day 2021, the yearly event of the Indian Chemical Society, had been organized on February 28 and March 01, 2021. The Indian Chemical Society and the Department of Chemistry, Jadavpur University jointly celebrated National Science Day on 28th February & 1st March (Sunday & Monday), 2021. Theme topic was “**Science for Sustainable Development**” on 28/02/2021. The Science Day was celebrated by organizing competitions of Speech, Poster, Model, and Essay amongst School children and College/University students. This programme was inaugurated by Prof. G. D. Yadav, President, Indian Chemical Society. The Keynote address was delivered by Dr. T. Ramasamy, Former Secretary, DST, Government of India. Prof. D. C. Mukherjee introduced the importance of Science Day. Prof. Uday Maitra, Indian Institute of Science, Bangalore delivered the popular Lecture on “Chemistry is Everywhere!”. The pride of Indian Science, Sir. C. V. Raman, discovered the Raman Effect on 28th February, 1928 who worked in the Indian Association for the Cultivation of Science, Kolkata and was awarded the Nobel Prize in 1930. Govt. of India declared in 1987 the 28th February as National Science Day. Science works for the Benefit of Mankind. Scientific knowledge has led to remarkable innovations that have been of great benefit to society. Most of the benefits of science are haphazardly distributed although Science does not work for ‘Rich’ or ‘Poor’; Science for all. A National Seminar was organized on 1st March, 2021 on “**Material Chemistry – Today & Tomorrow**”. Prof. Ashok K Ganguly, Former Director, INST, Chandigarh & Professor, IIT, Delhi inaugurated the Seminar and Prof. Dipankar Mandal, INST, Prof. Abhishek Dey, IACS, Kolkata delivered Invited Talks. Young researchers and other dignitaries presented their research works on this platform.

The programme included following competitions -

Group –A: Class V – VI

(i) For Essay: -

Topic: Gopal Bhattacharya / Acharya JagadishChandra Bose

(ii) For Speech, Model and Poster:-

Topic: Save the Environment, Save life

Group –B: Class VII – VIII

(i) For Essay:-

Topic: Sir C. V. Raman / Prof. Venkata Ramakrishnan

(ii) For Speech, Model and Poster

Topic: Biofertilizer: Future Issues to Sustainable Development

Group –C: Class IX – X

(i) For Essay:-

*Topic: Professor Asima Chatterjee / Prof. Amal Mukhopadhyay /
Prof. Balaram Sahani*

(ii) For Speech, Model and Poster:-

Topic: Water - Crisis and conservation

Group – D: Class XI – XII

(i) For Essay:-

*Topic: Nobel Prize 2020: Physics/Chemistry/ Physiology or
Medicine (any one)*

(ii) For Speech, Model and Poster:-

Topic: Dry Cell Battery: Energy Sustainability

Group – E: UG & PG Students of Science & Technology Departments

Poster Presentation: - (PPT Presentation, Max. 5 slides, Time 5 min.)

Topic: Science for Sustainable Future

Group – F: Research Scholars /Faculty Members

Poster Presentation: Theme: Material Chemistry – Today & Tomorrow

Keynote Address

Dr. Thirumalachari Ramasyamy

Former Director of CSIR-CLRI, Chennai

Former Secretary of DST, Government of India



Today I will discuss the dedication and the path of Acharya P. C Ray to the field of chemistry or more specifically to **Indian Chemists and Chemical Industry**. I have divided the talk into three sections. The first part will dictate the inspirational work of Acharya P. C Ray and a profile of paths laid for emulation. In the second part, I will summarize the impact of his work and his life on me. Finally, I will give an idea about the growth of Indian chemical research and industry along the emulative path of Acharya Ray. The persona of Acharya P C Ray remains an ever inspiring example for all chemists of India to emulate. He is the father of modern Indian chemical research. He dared to make compounds that others considered that could not be made and ventured to make some new compounds ahead of any like, Ionic liquids, mercurous nitrite, and so on. He went beyond the discovery to apply chemistry and manufacture industrial chemicals & Pharmaceuticals. He is really a role model to many scientists and to me also. He had some few characteristics which made him a unique personality. He has the daring to explore beyond the known frontiers; he is a devoted teacher and a well-known chemist; he has funded Bengal Chemicals & Pharmaceuticals which was the 1st pharmaceutical company in our country; he has donated all his material wealth to society. Acharya Ray did not have a colonial mindset that “Anything English is better than our own” and sought to explore challenging areas. This is taken from the publication of A, Chakravorty. A controversy was arising regarding the preparation of double sulphate salts. In 1855, Vohl claimed to have made numerous double sulphate salts of bivalent metal ions; Aston and Pickering challenged the report in 1886; but PC Ray ventured to carry out extensive work on such double sulphate salts and cleared the scientific doubts prevailing at that time. Later, with the help of X-Ray analysis, many unanswered questions were answered. As I told that, PC Ray worked on the ionic liquid. Ethyl ammonium nitrate $[\text{EtNH}_3]^+ [\text{NO}_3]^-$ is considered as the first reported room temperature ionic liquid. It was synthesized and reported by Walden 1914. But PC Ray and his co-worker Rakshit had reported the compound earlier in 1911 which was also a room temperature ionic liquid. He has a multi-dimensional personality. He has gained global recognition through work on

mercurous nitrite and its derivatives. He has inspired many young chemists like, Meghnad Saha and S S Bhatnagar & built an Indian school of chemistry. He believed the progress of India needs industrialization. He has donated all his salary to the University and the creation of 2 research fellowships. In 1923, he organized Bengal Relief Committee and collected nearly 2.5 million rupees in cash to distributed relief material to the affected people. He had said these words regarding the Research-Industry Symbiosis through chemistry in Europe and America that “In Europe, industry and scientific pursuit have gone hand in hand, one helping the other. The gigantic progress in industry achieved in Europe and America is a history of the triumph of researchers in the laboratory. These thoughts were weighing heavy upon me at the very threshold of my career at Presidency college. How to utilize the thousand and one raw products which Nature is her bounty has scattered in Bengal? How to bring bread to the mouths ill fed”. He is a model for Indian chemists by his scientific approach, his discovery, his chemistry based solutions and recognition of chemistry for Industry. Part 2; the inspiration that I have gathered from the work and life of PC Ray. The work with chromium and the work in bio-inorganic chemistry, industrial chemicals and pharmaceuticals are all the results of the inspiration that have gained from PC Ray. The discovery of science driven by the excellence of PC Ray leads to understand the factors controlling chemical reactivities using chromium as an exemplar and make compounds that others felt that they could not be made through rational synthesis. Few new lessons added to chemistry of Cr and Electron Transfer; Substitution mechanisms vary with the nature of the non-leaving ligand environment as well; Chromium(III) is not always substitutional inert; Stabilization of Cr(IV) and (V) is feasible by regulating the reorganizational energies for redox interconversion, Template synthesis of complexes of trivalent metal ions is better carried out by reversing the order of addition of ligating molecules; Soft sphere models for understanding octahedral substitutions are more relevant; Hybrid approaches of classical and quantum mechanics are useful. The implication of Cr in real life; Cr can be used in control of diabetes; Cr can be used in apoptosis. But there is some obvious toxicity of Cr to living organism. The problem associated with the Cr-industries can be sort by some designer solutions. The eco threat of chromite ore processing residue can be overcome by mobilize 100% of Cr in COPR thru oxidative micro explosion. The eco threat of Cr bearing industrial effluents can be minimized by designing a continuous Cr recovery system for tanneries. Solution to environmental problem associated with Cr can be overcome by carry out in situ oxidative micro explosion within COPR for selective removal of Cr; Fe^{2+} is replaced by Myrabolan as reductant for providing e^- and H^+ ; Cr(III) bearing water wastes precipitate as $\text{Cr}(\text{OH})_3$ & reuse. The solution designer approach of PC Ray inspired to do

ecology solution to environmental problems faced by the society in a tannery cluster in Tamil Nadu. The role in averting an industrial catastrophe convergent solutions; Tamil Nadu had emerged globally as a major tannery cluster with about 6% of the supply of leather being processed by 1995; Tanning activity in the state had exceeded the carrying capacity in the region; By 1995, citizens of Vellore district had taken the tannery sector to the Supreme Court; In 1996, SC ordered the closure of 400 tanneries and jobs of 2,50,000 people were threatened; Environmental preparedness of the sector was to be enhanced significantly on war footing, “Do Ecology” mind set was seeded. 100% of tanneries in Tamil Nadu are connected to pollution control devices and comply with all norms. All tanneries practice zero liquid discharge. They have moved zero discharge model; Implementation to Zero Liquid Discharge Safely can be done by treated waste waters in tanneries contain Total Dissolve Solids (from NaCl and Na₂SO₄) unsuited for discharge into public lands and water bodies. The zero liquid discharge system is adopted in Tamil Nadu which involves pre-treatment of tertiary treated waste waters, RO for water recovery, evaporation of RO rejects and safe-storing of recovered salts and technologies for viable value regain of salts recovered have now been standardized. Tannery sector in Tamil Nadu has tied up with chloralkali industry for using the recovered salts from RO rejects to get a complete environmental solution. All of this can be achieved by applying the knowledge on collagen of CLRI through Burn management. This has obtained 12 patents. This picture with smile dictates that radiates the value of useful research delivered through collagen sheet. This is the part of the academic family which adds values to ideas. Now the Part 3; The path and dreams of Acharya P. C Ray towards the development in the Indian Chemistry Scenario. Transition of Chemical Research in India can be summarized as; Along the path of Acharya PC Ray research in chemistry is gaining importance and started to make global presence in terms of volumes of publications in scholarly journals; During the period 1996-2000, in terms of number of publications in scholarly journals, India ranked 10th; During 2016-20, India figures 3rd in volume of publications in SCI journals and this progress will certainly make happy to the great soul of PC Ray. This table suggests the gradual progress of the number of papers from India and the rise of India in the World of chemistry. The growth trends of Indian Chemical Research in the publication act can be understand by the graph. All this progression was obtained along the path of the PC Ray; PC Ray led from the front Indian chemistry in the act of publications in early 20th Century; Indian chemistry is a major contributor to the world of scholarly publications since the start of 21st century. The vibrancy of Indian chemical research in chemistry suggests the expanding author base of Indian Chemistry. Number of persons involved in publishing papers in scholarly

journals is a vibrancy indicator or research in a country; There has been six-fold increase in the number authors publishing papers in SCI indexed journals from India. Indian chemistry is now going global. The modern research is built on global collaborations; One of the ESI indicators for global impact of publications is the number of highly cited papers from a country; Growing trends in number highly cited papers in chemistry from India and its relative global ranking are assessed. Now I will say about the industrial approach of PC Ray. He established Bengal chemicals and Pharmaceuticals in 1901. It involved several other scientists and nationalistic leaders and grew in size; Multiple factories were established and phenyl and naphthalene balls came from this chemical industry. Indian Chemical Association (ICC) was founded in 1938 by P. C. Ray and his colleagues. Bengal Chemicals and Pharmaceutical was set up by P.C Ray at Calcutta University. This is the growth of chemical and pharmaceutical industry in India. The Indian chemical sectors both Chemical industry in India and Chemical Research in India has increased many fold in 2020. The chemical industry in India valued @100 billion \$ in 2019; It contributes to around 7 % of the Indian GDP; This is the 6th largest in the world and 3rd largest in Asia; It employs around 5 million people. The chemical research in India Commanded about 6.7 % share of global publications in 2019; 3rd largest global publication base in 2019; 3rd largest share of highly cited papers in Asia and more than 50000 R&D persons published. The status of Indian Chemical Industry in global trade can be viewed as, it occupies a significant global position, in speciality chemical area with sustainability parameter is economy of scope and ability to provide value for money through technology addition. The Indian petrochemical sector obtained ability to add value for global raw materials through technology addition and enjoys positive balance of trade which derived from technical merits and competitiveness. For Indian Pharmaceutical sector, India's domestic pharmaceutical market turnover has reached Rs 1.4 lakh crore (US\$ 20.03 billion) in 2019 and the sector was valued at US\$33 billion in 2017. India is the largest provider of generic medicines globally and the generic drugs account for 20 per cent of global exports in terms of volume. The growth of Indian pharmaceutical industry can be viewed as, India is the largest provider of generic drugs globally with over 50% of global demand for various vaccines, 40% of generic demand in the US and 25% of all medicine in the UK. India boasts of a pool of scientists and engineers connected to the industry; over 80% of the antiretroviral drugs used globally to combat AIDS are supplied by Indian firms. The field of Indian R&D in Pharma sector in Post COVID world can be summarized as Council of Scientific and Industrial Research established under the guidance of Dr SS Bhatnagar, a student of Acharya Ray in 1942 has been the major National R&D house for Pharmaceutical sector

in early years; IIT Bombay stepped up R&D amid COVID-1; Jubilant Generics Ltd entered into a licensing agreement with US-based Gilead Sciences Inc to manufacture and sell the potential COVID-19 drug Remdesivir in 127 countries, including India. The Indian pharmaceutical sector in IPR can be viewed as, in 1970, India enacted a law against patenting of medical products as social objective. In 1994, India signed Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement with IPR for medical products. India included a crucial clause to the agreement in the form of the right to grant compulsory license where the government felt that the patent holder was not serving the public health interest through a new legislation as section 3(d). Nine sectors are grouped as high technology- trade linked and Chemical and Pharmaceutical sectors form two of those nine sectors of industry. The table suggests the share of Trade in high technology sector in 2007 by India to around 3.2 and 1.7 % for Chemistry and Pharma industry respectively. The theme of the science day can be summarized as from the education sector, skill and work. Education sector is scale expanding rapidly with associated challenges. Could STI developments aid in coping with o overcoming challenges of the country? Gandhi stressed skill as the power connector of mind, eyes and hands enhancing cognitive processes in man. How STI could help in cognitive position in of skill in society? Could STI lead in the transition of India from Lower Middle to Upper Middle Income group nation within 10 years through job creation? The talk can be summarized as, On the Science Day of the country of 2021, we recalled the inspiration from the life and work of the Father of the Indian Chemical research, Acharya P C Ray. Part 1 described the key messages from the life Professor Ray, Part 2 shared in brief an anecdotal story of the impact of his path and Part 3 gave a report card on the status of chemical research and industry in India; Science Day is in celebration of a remarkable discovery emanating from India. As celebrate, let us rededicate ourselves to service of the society along path of P C Ray. Finally, I want to say that, path of PC Ray was to serve through chemistry and his path is to lose oneself in the service of Indians.



About Dr. T. Ramasyamy

Dr. Thirumalachari Ramasami, Former Secretary to the Government of India in the Department of Science of Technology is a chemist, technologist, and a civil servant. He graduated in Secondary School Leaving Certificate (SSLC) from G.S. Hindu High School, Srivilliputtur in 1963, Pre-University from St. Joseph's College, Trichy in 1964, Bachelor and Master of Technology in Leather Technology from the University of Madras in 1969 and 1972, respectively and Doctor of Philosophy in Chemistry from the University of Leeds, England in January 1976. He carried out post-doctoral research in energy at the Ames Laboratory, Iowa State University USA during 1978–80 and on electron transport phenomena at Wayne State University, Detroit, USA during 1981–83. He was a visiting Fellow at University of Newcastle upon Tyne during 1983–84. Coming back to India in 1984, he joined Central Leather Research Institute as an assistant Director. When he became the Director of CLRI in 1996, he prepared a vision document 'CLRI Vision 2005', and directed the Leather Technology Mission with 170 projects in throughout the India. His working model for development and collective decision making, led CLRI in providing cleaner tanning technology options for a group of 764 tanneries in a record time of 12 months, and 900 tanneries going green in just about 18 months. His leadership of CSIR-Central Leather Research Institute gained for the institute global leadership in leather research and his contributions in strengthening Academy-Research and Industry partnerships in Leather sector are well known.

His research covers a wide span of topics and it contributed to diverse areas of sciences. He has published more than 250 scientific papers, filed 50 patents and 12 were commercialized. Several technologies established by his group are in extensive industrial use in the country.

He was one of the longest serving Secretaries in the Government of India 2006 to 2014. During his period as Secretary, DST introduced several new programmes and schemes for R&D funding. DST-INSPIRE fellowship, which has arisen as the game changer in attracting research talent to science, focused on rejuvenation of research in Indian. He was closely associated with the establishment of Science and Engineering Research Board (SERB) aimed at de-bureaucratization of R&D funding are indicators of the directional changes in science scenery of India. He was a major contributor to the formulation of Science, Technology and Innovation Policy 2013 of India.

Among his numerous honors, Dr Ramasami was awarded the Shanti Swarup Bhatnagar Prize for chemical sciences in 1993, Padma Sri in 2001 and Padma Bhushan in 2014.

He was also awarded with Coleman Research Prize, 1976, Material Research Society of India (MRSI) Medal, 2001, Vasvik Prize for Environmental Technologies, 2004, Vasvik Prize for Chemical Sciences, 1997, Great son of the soil award from All India conference of intellectuals, 2003 and Dr. Y. Nayudamma Memorial Award, 2008 and Platinum Jubilee Award of the Indian Chemical Society, 2001.

He is an elected Fellow of Indian National Science Academy, Indian Academy of Sciences, National Academy of Sciences of India, Indian National Academy of Engineers and The World Academy of Sciences. Indian Chemical Society is felling proud to confer him the Honorary Fellowship in its 159th Birth anniversary celebration (9th May 2021).

Invited Talks

Oxygen Electrocatalysis with Functional Materials towards Rechargeable Zinc-Air Battery and Water Electrolyser

Prof. C. R. Raj

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<http://www.chemistry.iitkgp.ac.in/fac/CRR/index.php>



Abstract:

The increasing environmental concerns associated with the extensive use of fossil fuel and the depletion of fossil fuel demands for economically viable and environment friendly alternative energy source for the daily needs. The renewable energy sources of low emission are limited by time and an ideal energy storage system is critically required to assure a balanced power supply. Metal-air and metal-ion batteries are emerging as potential energy storage devices. The performance of metal-air battery largely depends on the oxygen electrocatalyst at cathode. The rechargeable metal-air battery requires an efficient bifunctional electrocatalyst that can simultaneously catalyze both oxygen reduction and oxygen evolution reactions. The recent development in the synthesis of bifunctional

oxygen electrocatalysts for the fabrication zinc-air battery (ZAB) and the potential applications of ZAB in powering supercapacitor and electrochemical water splitting will be discussed.

References:

1. N. Kobayashi, Oxygen Electrocatalysis, in Encyclopaedia of Electrochemistry, Wiley, 2007.
2. (a) *ACS Appl. Mater. Interfaces* **2014**, 6, 2692. (b) *J. Mater. Chem. A*, **2016**, 4, 8384. (c) *J. Mater. Chem. A*, **2016**, 4, 587. (d) *Int. J. Hydrogen Energy* **2016**, 41, 22134. (e) *J. Mater. Chem. A*, **2016**, 4, 11156. (f) *J. Phys. Chem. C* **2018**, 122, 18468. (g) *J. Phys. Chem. C* **2018**, 122, 15843. (h) *ChemElectroChem*. **2018**, 5, 2348. (i) *ACS Appl. Mater. Interfaces* **2019**, 11, 14110. (j) *J. Electroanal. Chem.* **2019**, 847, 113183. (k) *ACS Appl. Nano Mater.* **2019**, 2, 643. (l) *Chem. Commun.*, 2019, 55, 4399. (m) *J. Power Sources* **2020**, 455, 227975. (n) *J. Phys. Chem. C* **2020**, 124, 9631. (o) *J. Power Sources* **2020**, 477, 229038. (p) *ACS Appl. Energy Mater.* **2020**, 3, 2811. (p) *Sustainable Energy Fuels*, **2020**, 4, 4008.

Bio sketch

Dr. C. R. Raj

Professor of Chemistry, Department of Chemistry, Indian Institute of Technology Kharagpur, India.

Post-doctoral Research:

1998-2000 Department of Electronic Chemistry, Tokyo Institute of Technology, Japan

2000-2002 Venture Business Lab Post-Doctoral Fellow, Tokyo Institute of Technology, Japan

Teaching/research Position:

2002-2008 Assistant Professor, Department of Chemistry, IIT Kharagpur

2008-2014 Associate Professor, Department of Chemistry, IIT Kharagpur

2014- Professor, Department of Chemistry, IIT Kharagpur

Awards and Honors: Editorial Advisory Board Member, ACS Applied Materials & Interface, Associate Editor of JCS, CRSI Bronze Medal 2013, ISEAC 2010 Award, Highlighted by ACS as Author of high-quality research

Specialization: Materials Chemistry and Electrochemistry

Research Interest: Functional materials, biosensors, electrocatalysis, energy conversion and storage- fuel cell, supercapacitor, metal-air battery and water splitting.

Papers published: 108 (in reputed international journals), **Patents:** 6 (2- Japanese and 3- Indian and 1-US), **Book:** 2 (two chapters)

Effective Mechanical Energy Harvesting Approach in MOF Mediated Electro-active Materials

Dipankar Mandal

Institute of Nano Science and Technology, Knowledge City, Sector 81,
 Mohali 140306, India

Email: dmandal@inst.ac.in



Abstract:

Real time applications of piezoelectric nanogenerators (PNGs) under harsh environment remain a challenge due to lower output performance and durability. Thus, development of flexible, sensitive and stable PNGs became a topic of interest to capture the mechanical vibrations available around us to convert the electrical throughput. In this context, polymer materials, particularly poly(vinylidene fluoride) (PVDF) and its copolymers are promising. However, the crystalline phase dependency, especially the nucleation of piezoelectric β -phase is one of major challenge and subsequently electrical poling is one of prerequisite step to get piezoelectric throughput. Recently it has been introduced that by incorporating the porosity in PVDF which is known as electret structure, one can improve the piezoelectric coefficient enormously.^{1,2} Recently we have shown that by incorporating 3D metal organic framework (MOF) in PVDF matrix, tuneable porosity throughout the composite film is possible to achieve along with self-poled piezoelectric β -phase that give rise high mechanical sensitivity (~ 8 V/kPa or more) as well as high electrical throughput (~ 32 μ W/cm² of power density). Furthermore, we have incorporated MOF in PVDF nanofibers and found synergistic effect in mechanical sensitivity that promises in several applications, such as health care sector to smart intelligence. In this presentation, it will be demonstrated how the output PNG is possible to use in self-powered mode to operate several portable electronics devices.

1. S. K. Ghosh, T. K. Sinha, B. Mahanty and D. Mandal, *Energy Technology* 2015, 3, 1190–1197.
2. K. Roy, S. Jana, S. K. Ghosh, B. Mahanty, Z. Mallick, S. Sarkar, C. Sinha and D. Mandal, 3D MOF Assisted Self-Polarized Ferroelectret: An Effective Auto-Powered Remote Healthcare Monitoring Approach, *Langmuir* 2020, 36, 11477–11489.

Bio sketch

Dr Dipankar Mandal received his PhD in 2008 from BTU Cottbus, Germany. Prior to that, he obtained his MTech in Materials Science and Eng. (2004) and MSc in Physics (2002) from IIT Kharagpur, India and Jadavpur University, Kolkata, India, respectively. He is currently working as a Scientist in the

Institute of Nanoscience and Technology (INST), Mohali, India. He was an Assistant Professor in the Department of Physics, Jadavpur University, Kolkata, India from year 2008–2017. His research interests include the synthesis of advanced multifunctional materials, flexible electronics, piezo-, tribo-, pyro-, and ferro-electric materials, organic photovoltaics, and electro-spinning systems for the development of new-generation nanofiber fabrication, 3D printing, smart textiles, and non-invasive bio-sensors for healthcare monitoring, and designing mechanical and thermal energy harvesters for self-powered devices and IoTs.

Rational Design of Electrocatalyst for CO₂ Reduction

Abhishek Dey

School of Chemical Science, Indian Association for the Cultivation of Science, 2A Raja SC Mullick Road, Kolkata, 700032

*Email: icad@iacs.res.in



Abstract:

Iron and Co complex with covalently attached proton transfer motifs are tuned to reduce CO₂ to CO as well as formic acid selectively under different experimental conditions. The selectivity is governed by relative binding affinity of the reduced Fe center towards CO₂ and H⁺ which in turn can be tuned by utilizing the distal functional groups. Resonance Raman spectroscopy, FTIR and electrochemical techniques are used to elucidate the reaction mechanism. The role of different intermediates in governing the selectivity will be illustrated. The tailor-made complexes are demonstrated to be among the most selective and efficient electrocatalysts to be developed till date.

Bio sketch

Dr. Abhishek Dey, Professor, IACS Kolkata.

Works in inorganic chemistry of multi-electron and multi-proton process.

<http://iacs.res.in/faculty-profile.html?id=38>

Chemistry is Everywhere!

Uday Maitra

Department of Organic Chemistry

Indian Institute of Science

Bangalore 560 012



Abstract:

Chemistry is the central, useful and creative science. Chemistry plays significant roles in our health, clothing, transportation, food supply, quality of life, environment etc. Unfortunately, the importance of Chemistry in our daily life is often taken for granted and forgotten! I will begin this lecture by highlighting this point by taking examples around us. I will end the lecture by describing, in simple and general terms, how one goes about doing scientific research.

Bio sketch

Uday Maitra is a Professor, Department of Organic Chemistry, Indian Institute of Science, Bangalore 560 012. After his BSc from Presidency College, Calcutta and MSc from IIT Kanpur, Uday Maitra received his M. Phil and PhD from Columbia University in 1986 working with Prof. Ronald Breslow. Following a postdoctoral stay at the University of California at Berkeley with Prof. Paul Bartlett, he returned to India, and after a year at IIT Kanpur moved to IISc Bangalore in 1989. His research interests are in the Chemistry of Bile acids; Hydrogels, Metallohydrogels and Organogels; Organic-inorganic hybrid materials; Enzyme sensing, etc. His group has recently developed a general strategy for low cost, paper based photo-luminescent enzyme sensors.

He is also greatly interested in Chemistry Education and is a regular participant in a variety of outreach programmes for high school and undergraduate students. He has received a number of awards and honours including the S.S. Bhatnagar Award in Chemical Sciences in 2001, and is an elected fellow of the Indian Academy of Sciences and the Indian National Science Academy.

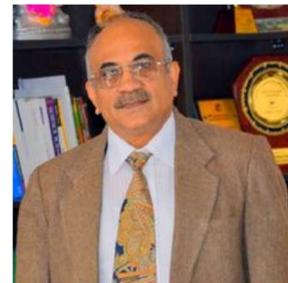
(<https://iiscprofiles.irins.org/profile/3687>)

Design of Advanced Materials

Ashok K Ganguli

Indian Institute of Technology, New Delhi 110016, India

Email: ashokganguliitd@gmail.com



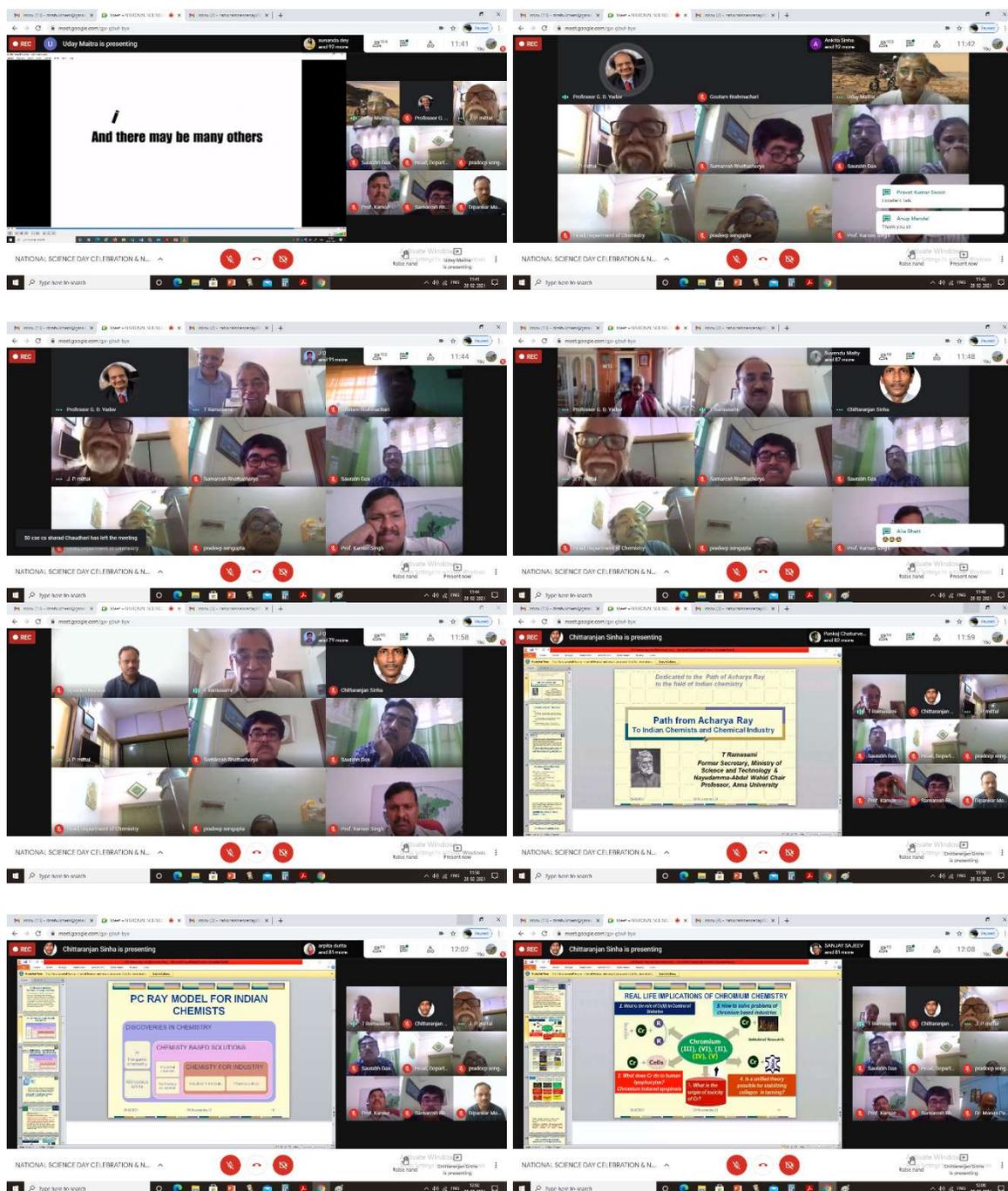
Abstract:

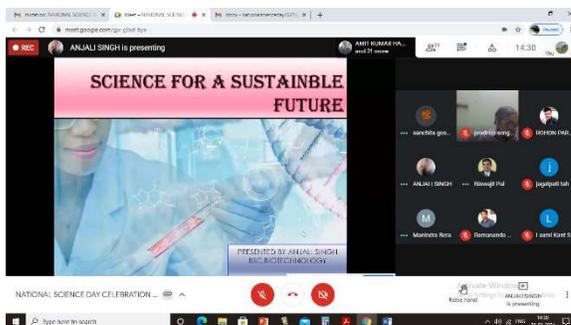
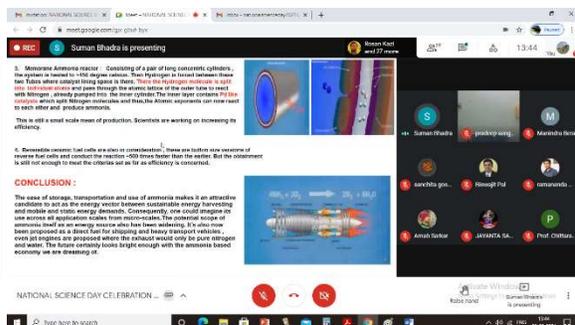
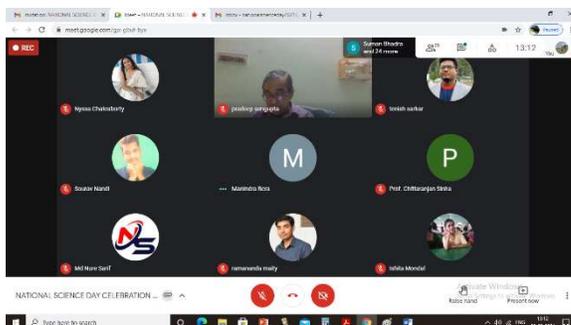
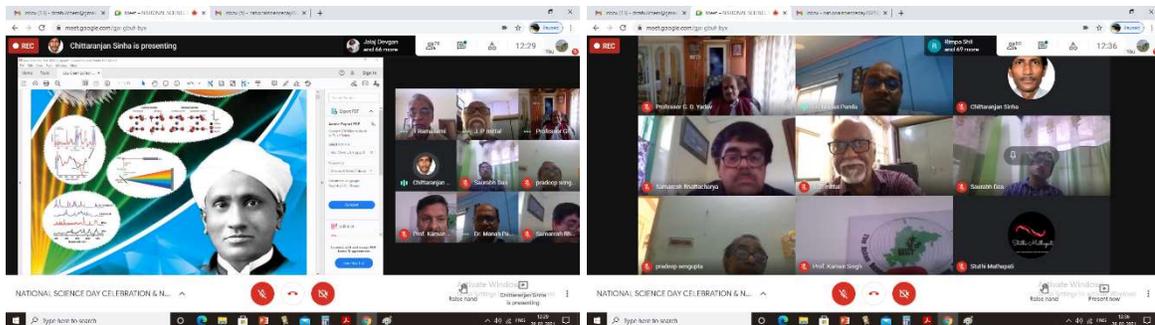
Chemical routes like co-precipitation, solvothermal, sol-gel and microemulsion based methods are being used for designing materials including nanomaterials. The morphology and size can be tuned by changing the conditions during the reaction such as pH, solvent, temperature, presence of additives such as ions, surfactants etc. Diverse materials including metals, alloys, oxides, chalcogenides and borides with varying structures and functionalities having exciting applications will be discussed.

Bio sketch

Professor Ganguli is currently Deputy Director and Institute Chair Professor of Chemistry and Professor of Materials Science & Engineering at IIT Delhi. He is also the founding Director of Institute of Nano Science and Technology in Mohali, Punjab. Prof Ganguli studied Chemistry from University of Delhi and obtained his PhD from Indian Institute of Science Bangalore (1990). He was visiting scientist in Dupont Company, USA, Iowa State University, USA and EPFL, Switzerland. His broad research area is Materials Chemistry and specifically in Nanomaterials, Microemulsions, Photoelectrochemical Applications and Superconducting Materials. He has published around 325 publications and has filed five patents (two granted). He is a recipient of several awards (CRSI Silver Medal, MRSI Medal, DST award on Nanotechnology, Nano India Award given by Karnataka Govt, CRSI-CNR Rao National Prize, A V Rama Rao Lecture Award, Prof J N Mukherjee Lecture award, Sastra Award in Chemistry and Materials Sciences) and is a fellow of Indian Academy of Sciences and National Academy of Sciences, India and FRSC(London). He is passionate about reaching out to young students in schools/colleges especially in rural and remote areas. Currently he is the coordinator of the Delhi S&T Cluster (initiated by PSA, GOI).

Glimpses of the program on 28th February and 1st March, 2021





Total List of Awardees of the Competitions held on February 28 and March 01, 2021

Group A (Class V and VI)

- Arshad Salembasha, Class VI, Indian School Of Al Maabela, Oman, 1st
 Sheeza Riyas. K. V, Class VI, Indian School Al Maabela, Oman, 1st
 Geetanjali, Class V, Indian School Al Maabela, Oman, 1st
 Samriddhi Pore, Class V, Ghatal Rishi Aravinda Adarsha Vidyamandir, West Bengal, 1st
 Rohesh Jovi, Class V, Indian School Al Maabela, Oman 2nd
 Aman, Class VI, Indian School Al Maabela, Oman, 2nd
 Vinushka, Class VI, Indian School Al Maabela, Oman, 2nd
 Kanish Pamnani, Class V, Indian School of Al Maabela, Oman, 2nd
 Abdul Sami, Class V, Indian School Al Maabela, Oman, 3rd
 Nishant Singh, Class VI, Little Flower Higher Secondary School, Raipur, Chhattisgarh, 3rd
 Deyasini Samanta, Class VI, Contai Public School, West Bengal, 3rd
 Nishant Singh, Class VI, Little Flower Higher Secondary School, Raipur, Chhattisgarh, 3rd (Poster)

Group B (Class VII and VIII)

- Bitihotra Roymahapatra, Class VIII, Vivekananda Mission School, Haldia, West Bengal, 1st
 Amal Abdoul Rahaman, Class VII, Indian School Al Maabela, Oman, 2nd
 Rogit Jovii, Class VII, Indian School Al Maabela, Oman, 3rd
 Syedda Samia Fatma, Class VIII, C.M.O. Girl's High School (H.S.), Kolkata, 3rd

Group C (Class IX and X)

- Priti Das, Class X, Banipith Girl's H.S School, Banipith, 1st
 Pallabi Mahata, Class X, Government Model School, Nayagram, 1st
 Noor Aliya, Class X, C.M.O Girls' High School (H.S), Kolkata, 2nd
 Sheik Aamina, Class IX, Indian School Al Maabela, Oman, 2nd
 Saikat Khatua, Class X, Government Model School, Nayagram, 3rd
 Priya Singh, Class X, Jaiswal Vidya Mandir High School for Girls, Kolkata, 3rd

Group D (Class XI and XII)

- Shreetama Ghosh, Class XII, BSF Senior Secondary Residential School, Darjeeling, West Bengal, 1st
 Shazia Imtiyaz, Class XI, CMO Girls' High School (H.S), Kolkata, 2nd

Group E (UG & PG Students)

Suman Mandal, Jadavpur University, Kolkata, 1st

Arnab Sarkar, Jadavpur University, Kolkata, 2nd

Md. Nure Sarif, Department of Chemistry, Rampurhat College, West Bengal, 3rd

Group F (Research Scholars & Others)

Mr. Kingshuk Debsharma, Department of Chemistry, Indian Institute of Technology Madras, Chennai, 1st

Ms. Arpita Shome, Department of Chemistry, Indian Institute of Technology Guwahati, Assam, 1st

Ms. Suvani Subhadarshini, School of Nano Science and Technology, Indian Institute of Technology Kharagpur, West Bengal, 1st

Ms. Shagufta Haque, Department of Applied Biology, CSIR – Indian Institute of Chemical Technology, Hyderabad, 2nd

Dr. Basudeb Dutta, Department of Chemistry, Aliah University, Kolkata, 3rd

Dr. Suwendu Maity, Department of Chemistry, Jadavpur University, Kolkata, 3rd

Upcoming programme of the Indian Chemical Society



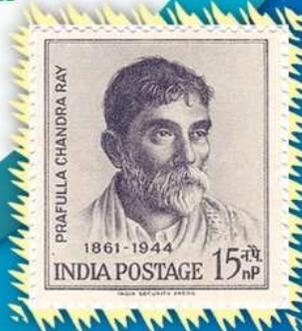
160th Birth Anniversary Celebration of Acharya P. C. Ray

International Seminar on

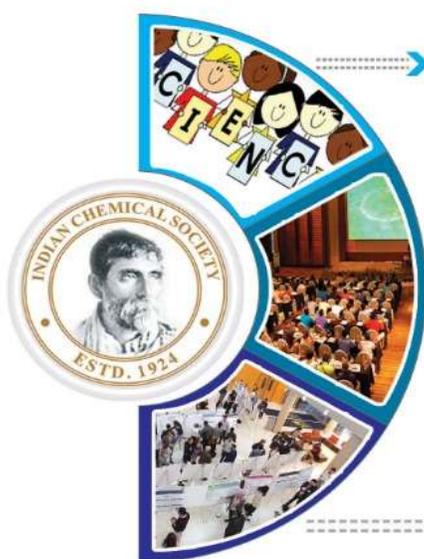
Recent Advances in Chemistry and
Material Science (RACMS-2021)

Young Scientist Conclave
(YSC-2021)

Student Science Meet
(SSM-2021)



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1st August, 2021
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(From Class V to XII &
UG, PG Students)

2nd-3rd August, 2021
**International Seminar
RACMS-2021**

7th-8th August, 2021
YSC-2021

Organized by : **Indian Chemical Society**



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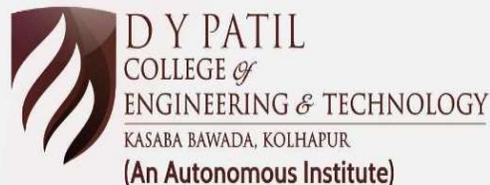
Kolkata



programics4@gmail.com

Some other upcoming important Events

On the occasion of National Technology Day



Online webinar organized by
Research and Development Cell

of D. Y. Patil College of Engineering and Technology, (An Autonomous Institute) Kasaba Bawada, Kolhapur

Topic :

**CITIUS, ALTIUS, FORTIUS:
ACHIEVING EXCELLENCE IN
HIGHER EDUCATION**

Date: Tuesday 11th May 2021

Time: 5.00 pm onwards

Meeting ID: 844 9821 1780

Passcode: DYPCET



Online Webinar Link:

tinyurl.com/33kukj8

For more details contact

9326601860, 98501 69818

E -Certificate will be given to registered participant



Speaker:

**Padmashree
Prof. (Dr.) G. D. Yadav**

Former Vice Chancellor,
Institute of Chemical Technology, Matunga, Mumbai
Emeritus Professor of Eminence
J C Bose National fellow (Govt of India)
R T Modi and Tata Chemicals Darbari seth
distinguished Professor Innovation and Leadership
President Maharashtra Academy of Science.

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  coek.dypgroup.edu.in

MSME Chamber of Commerce and Industry of India

5th | June | 2021 | 03.00 pm. IST

ZOOM MEETING-857 0545 6441

Topic : Ecosystem Restoration and focus on resetting our relation with nature



Dr. Harsh Vardhan
Minister of Science and Technology,
Minister of Health and Family Welfare and Minister of Earth Sciences, Govt of India



Mr. Indrajit Ghosh
Global Chairman
MSMECCI



Dr. Sandeep Marwah
President of Asian Academy
of Film & Television



Padma Shri Kartikeya Sarabhai
Founder and Director, CEE



Padma Shri G.D. Yadav



Dr. Sameer Joshi
Hon Treasurer Governing
Council
Indian Plastics Institute



Dr. Ajay Mathur
Director General
International Solar Alliance.
(Former Director General of TERI)



Ms. Ekta Narain
Director - Business
Development at Recykal
(Moderator Zoom Meeting)



Ms. Sanchita Jindal
Environment Consultant -
Former Advisor Technical
(Scientists G)
from Ministry of Environment,
Forest and Climate Change



Dr. Hemlata Gandhi
SM&ID Manager Kota,
Brand Ambassador
Bati Bacho Bato Pado
Abhiyan WCD



Dr. Sangeeta Ahuja
Founder Director, Urban Interiors
Chairperson, MENTORx Women
Director, MENTORx School of Learning



Dr. Atul Sud
Director Government Regulatory
& Legal Affairs
Perfetti Van Melle India

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International E-Conference on Recent Advances in Chemical, Physical and Biological Sciences



Organized By

Department of Chemistry, Nabira Mahavidyalaya, Katol
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Association of Chemistry Teachers (ACT),
C/o Homi Bhabha Centre for Science Education (TIFR) Mumbai

Date : 29-30th June, 2021

Time : 11.00 am IST on Zoom and streaming on YouTube

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Madhav Science P. G. College, Ujjain



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- SPEAKERS -



Prof. Ponnadurai Ramasami
Department of Chemistry
Faculty of Science
University of Mauritius
Republic of Mauritius



Dr. Kirankumar R. Surati
Associate Professor
Department of Chemistry,
S. P. University,
Anand, Gujarat



Prof. S. Nagarajan FRSC
Dean, School of Basic and Applied Sciences
Department of Chemistry
School of Basic and Applied Sciences
Central University of Tamil Nadu,
Thiruvavur



Prof. M. Swaminathan
Nanomaterials Laboratory,
International Research Centre,
Department of Chemistry,
Kalasalingam Academy of Research
and Education, Krishnankoil-626126



Prof. W. B. Gurnule
Department of Chemistry
Kamla Nehru Mahavidyalaya
Nagpur

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Nabira Mahavidyalaya,
Katol



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Convenor, RACPBS-2021
Nabira Mahavidyalaya,
Katol

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Department of Chemistry & IQAC

Organised

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on

"Recent Advances in Chemistry"

26th July 2021, Monday

at 11.30 am onwards

Resource Person



Dr. Wasudeo Gurunule

Professor - Dept. of Chemistry
Kamla Nehru Mahavidyalaya, Nagpur



Dr. Rajeshwar Rao

Professor & Dean
NIT, Warangal



Dr. Preeti Soni

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Dr. Vikash Gulhare

IQAC Co-ordinator



Dr. Nisha Sharma

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**MSME Chamber of Commerce and Industry
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World Environment Day, E Waste, Plastics, Glass,
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manjeshyadav14@gmail.com
ighosh.1457@gmail.com | ighosh.chairman@msmeccii.in | www.msmeccii.in



**MSME Chamber of Commerce and Industry
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Celebrating Platinum Jubilee Year



International Conference on Advances in Chemical and Materials Sciences (ACMS-2022)

(Hybrid Mode: Offline and virtual participation)

February 24-26

Organized by: Indian Institute of Chemical Engineers, Headquarters

In association with

National Institute of Technology, Jalandhar, Heritage Institute of Technology, Kolkata,
and Osmania University College of Technology, Hyderabad

Separate
Technical Session
for the UG and PG
students



About: ACMS-2022: The aim of ACMS-2022 is to bring together students (UG and PG), scientists, researchers, academicians, and industrialists from various sectors to exchange the knowledge and share their experiences and latest research outcomes about all aspects of Chemical and Materials Science.

Abstract theme

Materials Science and Engineering (MSE)

Advance Chemical Engineering (ACE)

Carbon, Polymer, and Composite (CPC)

Biochemical Science and Engineering (BSE)

Chemistry and Environment (CE)

Important Dates

Last date for Abstract Submission (200 words): 30th June, 2021

Abstract acceptance notification: 15th July, 2021

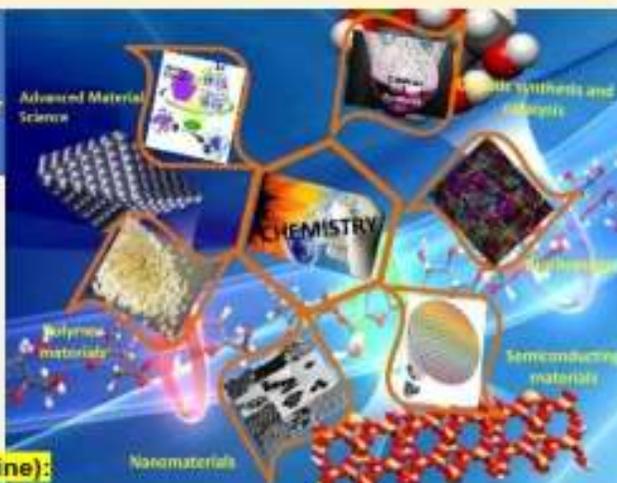
Full paper submission for publication: 30th September, 2021

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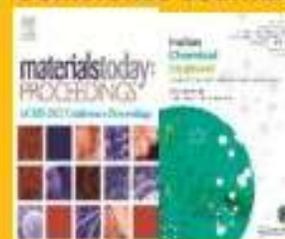
Venue (Online/Offline):



Publications:

All the accepted papers will be invited for publication in the reputed international journals or as a book chapter after the regular peer review process.

Conference Journals



Heritage Institute of Technology,

Kolkata

(M): 9830752111 /

9444954151

Contact us

Organizing Secretary, ACMS-2022

Indian Institute of Chemical Engineers

Dr. H.L. Roy Building, Jadavpur University Campus,

Kolkata 700032; Email: icacms2022@gmail.com



The presented papers in the ACMS-2022 will be considered for publication in reputed international journals i.e Material Today Proceedings (Elsevier), The Journal of Indian Chemical Society (Elsevier); Indian Chemical Engineer Journal (Taylor & Francis) after the regular peer review process as per the requirements of the publishers.

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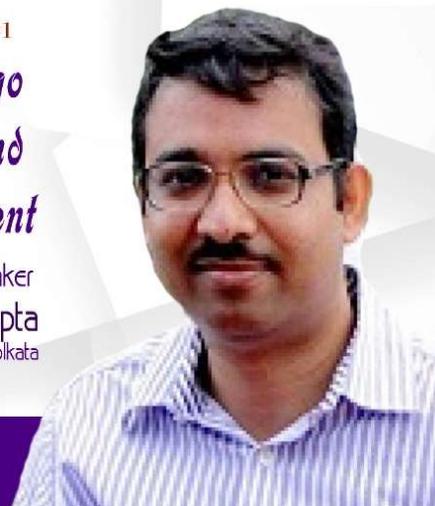


WEBINAR #1

*The Chemistry of Indigo
and
Its Relation to the Indian Freedom Movement*

Speaker

Prof. Sayam Sengupta
Department of Chemical Sciences, IISER Kolkata



9th August 2021

4pm



Meeting Id : 406 085 9483

Watch Live On
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11th IconSWM-CE & IPLA Global Forum 2021
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Second Call for Paper and Support Brochure : Conference Announcement

11th International Conference on Sustainable Waste Management & Circular Economy and IPLA Global Forum 2021

Modes of Conference Attendance & Presentation: Virtual Mode

Date : December 01 - 04, 2021, Venue: Jadavpur University, Kolkata, West Bengal, India

Principal Organisers:

International Society of Waste Management, Air and Water (ISWMAW), India
 International Partnership for Expanding Waste Management Services of Local Authorities (IPLA), Japan
 Centre for Sustainable Development and Resource Efficiency Management, Jadavpur University, India



CSD&REM, JU



ISWMAW



Under the aegis of : International Society of Waste Management, Air and Water (ISWMAW)

Submission Date : Abstract in 250 words & Full Paper (not mandatory) by 30/09/2021 to publication.iconswm@gmail.com
 Special Issue of international journals : Waste Management & Research (SAGE); International Journal of Energy Sector Management & Books

Organising Partners :



Submit Full Paper; Join 11th IconSWM-CE & IPLA Global Forum 2021; Interact with Researchers from 40 countries in the International Collaborative Research Meeting at the all time lowest discounted Registration Fee under the pandemic COVID-19. Visit: www.iswmaw.com

Papers / Best Practices Submission Details:

Submit Abstract within 250 word and Full Paper in minimum 6,000 & maximum 10,000 words by 30/09/2021 in A4 size, 11 font Times New Roman in English, MS Word containing the title of paper, author/(s) name, address, phone/mobile, fax, e-mail id etc., references for publication and presentation. Submission of Full paper is not mandatory.

Submit the paper to : publication.iconswm@gmail.com OR using this link: <http://forms.gle/K7isTTTTLaeNHoydW8>

Papers for Special Issues of International Journals and Book : All accepted full papers will be selected for special issues of Journals, a) WM&R (SAGE), b) International Journal of Energy Sector Management (IJESM) (Science Direct), and c) Author's work will be selected to publish in different books by internationally well known publishers.

Broad Topics of Paper:

Abstract and Full Paper submission date: 30/09/2021. Full paper is not mandatory.

Submit paper using this link: <http://forms.gle/K7isTTTTLaeNHoydW8>

- | | |
|---|---|
| <ul style="list-style-type: none"> ❖ COVID-19 Waste Management (Code A) ❖ Waste Management Business in post COVID-19 era (Code: A) ❖ Research, Development and Innovation (Code: B). ❖ Policies, SDGs, International Cooperation, (Code: C). ❖ Biodiversity and Climate Change (Code: C1). ❖ 3R, Circular Economy, Resource Recovery & Efficiency (Code: D). ❖ Secondary Raw Materials & Recycled Products (Code: D) | <ul style="list-style-type: none"> ❖ Marine littering, Plastic Waste Management & Plastic Recycling (Code: C1). ❖ Current Status, Best Practices and Implementation (Code: D1). ❖ Recycling, Treatment technologies and Final Sink (Code: E). ❖ SW Business, Smart Cities and Business Model, Urban Development (Code: F). ❖ MSW, E-Waste, HAZW, Bio-Medical Waste, CDW, Bio-Mass & Agri Waste, ELV (Code: F1) ❖ Waste Water Treatment & Water Resources Circulation (Code: F2). ❖ Agricultural & Agri-industry Waste and Vegetable Wastes (Code: G1). |
|---|---|

All the delegates have to be registered to join the 11th IconSWM-CE & IPLA Global Forum. Registration details are available in annex brochure and in website.

Core Group: Chairman, 11th IconSWM-CE & IPLA Global Forum 2021: Prof. Sadhan Kumar Ghosh, Professor, Jadavpur University & President, ISWMAW

Composition of Core Group, Country Specific Working Group (CSWG) & International Scientific Committee will be announced.

About IconSWM - ISWMAW: Sustainable waste management, sanitation and resources conservation are fundamental goals of the United Nations, articulated in SDG Sustainable waste management, sanitation and resources conservation are fundamental goals of the United Nations, articulated in SDG 2030, which has direct bearing on the quality of life for all, but more especially communities in cities. IconSWM is one of the biggest and popular conference platform of ISWMAW established in 2009 in India. 11th IconSWM-CE & IPLA Global Forum 2021 will deliberate on various issues related to policy, innovation and implementation in solid and liquid waste management and will be the official pre-event of Intergovernmental 12th Regional 3R Forum in Asia and the Pacific to be held in 2022 by Govt. of Japan and UNCRD.

All communications to be made to the followings : IconSWM-ISWMAW Head Quarters & Secretariat & IPLA Global Secretariat:

Prof. Sadhan K. Ghosh, Chairman, IconSWM-CE, Professor, ME Dept. and Chief Coordinator, Centre for Sustainable Development & Resource Efficiency Management, Jadavpur University, Kolkata, India; M : +91 9830044464 / 8777686385, Email: iswmaw@gmail.com; Other phones : +91 9038638642 / 9831050447 / 9883010828 / 8900541042 / 8240537668 /

Online Internship Course

Course Structure

40

working hours
(2 hours a day)

Registration fee

- i. For students: Rs.1000/-
- ii. For industrial personnel: Rs. 4000/-
- iii. Registration to ICS as Student Member + Webinar: 1200/-

For Industry, with registration Life Membership Rs 10,000/- and Life Fellowship, if qualified, for Rs 16000/-

Membership form available in the ICS website

Recommendation from the HOD/ Principal of College/ Registrar, University/ Director/Appointing Authority may be required for membership.

Webinar Course Schedule

15th Sep. – 28st Nov. 2021

Platform: Google meet link

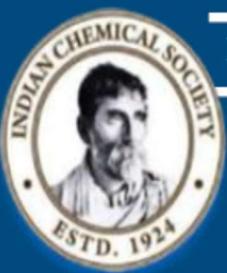
Eligibility

B.E./B.Tech in Chemical Engineering, Chemical Technology, Polymer Science and Technology, Biotechnology and Engineering, M.Sc. Physics, Chemistry, Material Science, Biotechnology, Microbiology, Marine Science, Nano Science, etc.

The course will start from 15th Sep. 2021 and details will be available in our website. The participants will be informed through their E-mail and group WhatsApp.

Last date of registration 14th September, 2021.

Certificate will be issued after the completion of webinar.



ICS – Headquarter Kolkata

Address: 92, Acharya Prafulla Chandra Road, Kolkata-700 009, West Bengal

<http://indianchemicalsociety.com>

Webinar Internship Course

“Emerging Trends in Nanomaterials for Different Device Architectures (ETNDDA-2021)”

15th Sep. – 28st Nov. 2021

Contact details

Course Coordinator

Prof. Sudip K Das

Dr. Subhasis Roy

Dept. of Chemical Engineering, University of Calcutta

Email: icsskd@gmail.com Mobile: 8697304884/ 9775032952

Website: <https://indianchemicalsociety.com/>

Bank details

NEFT/RTGS/ECS/Other Modes Details	
Name of Vendor	Indian Chemical Society
Bank Account Number	11152790242
Nature of Account	Current
Name of Bank	State Bank of India
Branch Name	Manicktala, Kolkata
Branch Code	01715
IFSC Code	SBIN0001715
PAN No.	AAAAH238H
MICR Code	700002062
IBAN No.	SBININBB492
Vendor Address	92, Acharya Prafulla Chandra Road Kolkata – 700 009
City	Kolkata



MGMUNIVERSITY
AURANGABAD

One day workshop on
Revised Framework of Accreditation of NAAC

Organized by
IQAC, MGM University, Aurangabad

PATRONS

Shri. Kamalkishor Kadam
Chairman
MGM Trust

Dr. P. M. Jadhav
Vice Chairman
MGM Trust

Shri. Ankushrao Kadam
Chancellor
MGM University

Shri. Prataprao Borade
Trustee
MGM Trust

Prof. Dr. Vilas Sapkal
Vice-Chancellor
MGM University

Dr. Ashish Gadekar
Registrar
MGM University



Speaker:
Dr. G. D. Yadav
Former Vice Chancellor, ICT, Deemed University, Mumbai.

Topic:
Importance of NAAC and Research



Speaker:
Dr. R. S. Mali
Former Vice Chancellor, North Maharashtra University, Jalgaon.

Topic:
Roadmap for achieving highest rank in Accreditation



Speaker:
Dr. Devender Kawday
Deputy Advisor, NAAC, Bangalore.

Topic:
"NAAC's Assessment & Accreditation Process"-An Overview



Scan QR Code for Registration

Date
31st July 2021

Time
10 am to 5.30 pm

NAAC Coordination Committee

Dr. H H Shinde
Dean,
Faculty of Engineering and
Technology, (Chairman)

Dr. Prapti Deshmukh
Dean,
Faculty of Basic and
Applied Sciences

Dr. Parvati Dutta
Dean,
Faculty of Performing Arts

Dr. Rekha Shelke
Dean,
Faculty of Social Sciences and
Humanities

Dr. Joyeeta Chatterjee
Dean,
Faculty of Management and
Commerce

Dr. (Col.) Pradeep Kumar
COE,
MGM University

Prof. Purna Dalvi
Deputy Registrar,
MGM University

Dr. R. R. Deshmukh
Director,
IQAC (Member Secretary)

Venue

Rukmini Hall, MGM Campus, Aurangabad

www.mgmu.ac.in



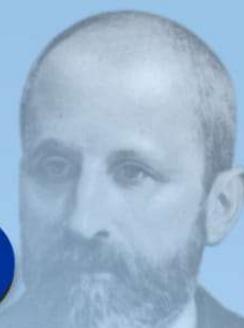
NCNST 2021

National Conference on Nucleic acid Science & Technology
Celebrating the 150th Anniversary of the Discovery of DNA

August 10-13, 2021

Genomics
Transcriptomics

Nucleic acid Secondary Structures
Nucleic acid Nanotechnology & Application

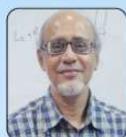


This year coincides with the 150th years of discovery of DNA by Friedrich Miescher in the Seyler's Lab. Since our group works on DNA, CSIR-Institute of Minerals and Materials Technology is organizing "National Conference on Nucleic acid Science & Technology (NCNST) while Celebrating the 150th Anniversary of the discovery of DNA" during 10th August to 13th August 2021 for the benefit of students and scholars across institutions. The 10th August is the death anniversary of Prof. Felix Hoppe-Seyler and the 13th August is the birth anniversary of Prof. Friedrich Miescher. Thus, the scheduled time will be more appropriate for this online event to offer our gratitude for their groundbreaking work which shaped the Bioscience research.

Eminent Speakers



Prof. Krishna N Ganesh
 Director, IISER Tirupati
Inaugural Address
 10 Aug 2021
 03:00 - 03:45 PM



Prof. Partha P Majumder
 NIBMGM Kalyani
 10 Aug 2021
 03:45 - 04:30 PM



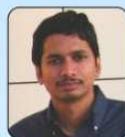
Dr Dhiraj D Bhatia
 IIT Gandhinagar
 10 Aug 2021
 04:30 - 05:15 PM



Dr Amit Kumar
 IIT Indore
 11 Aug 2021
 03:00 - 03:45 PM



Dr Tapasi Sen
 INST Mohali
 11 Aug 2021
 03:45 - 04:30 PM



Prof. Pradeepkumar PI
 IIT Bombay
 11 Aug 2021
 04:30 - 05:15 PM



Dr Sridhar Sivasubbu
 IGIB New Delhi
 12 Aug 2021
 03:00 - 03:45 PM



Dr Suchetan Pal
 IIT Bhubilai
 12 Aug 2021
 03:45 - 04:30 PM



Dr Souvik Maiti
 IGIB New Delhi
 12 Aug 2021
 04:30 - 05:15 PM



Dr Reji Varghese
 IISER Thiruvandrum
 13 Aug 2021
 03:00 - 03:45 PM



Prof. Jyotirmayee Dash
 IACS Kolkata
 13 Aug 2021
 03:45 - 04:30 PM



Dr Shekhar C Mande
 Director General, CSIR
Valedictory Address
 13 Aug 2021
 04:30 - 05:30 PM

Organizing Team



Patron
Prof. Suddhasatwa Basu
 Director, CSIR-IMMT



Convener
Dr Umakanta Subudhi
 usubudhi@immt.res.in
 +91-9938672226



Co-Convener
Dr T Pavan Kumar
 pavantogapur@immt.res.in
 +91-8008105781

Registration (Fee: Rs.100/- Only)

Link: <https://forms.gle/e4AttWgPA3m4TSyi8>
 Last Date of Registration: August 05, 2021

e-Participation Certificate will be provided

Participants

Academicians, Students,
 Scholars, Scientists & Teachers

Committee Members

Dr Nabin K Dhal, Dr Bhabani S Jena, Dr Trupti Das, Dr Sony Pandey, Dr Nilotpala Pradhan,
 Dr Manish Kumar, Dr Satyajit Rath, Dr Satya R Sahoo, Mr Sanjeev Pandey, Mr Bikram K Parida



immt

CSIR-Institute of Minerals & Materials Technology, Bhubaneswar 751013, Odisha, www.immt.res.in

