Virtual Conference on

Recent Advances in *bis* and *tetra*-Pyrrolic Molecular Materials

Organized by

Department of Chemistry, SPS, Central University of Kerala

24-26th AUGUST, 2020

Inauguration on

24th August, 2020 @ 10:00 – 10:45am

Google Meet Link

meet.google.com/zcf-qsgn-pqu

ALL ARE WELCOME

Inauguration

Prof. (Dr.) H. Venkateshwarlu
Hon'ble Vice Chancellor,
Central University of Kerala

Presidential Address

Prof. (Dr.) M. R. P. Kurup
Dean, School of Physical Science
Department Of Chemistry

Felicitation

Prof. (Dr.) A. Sakthivel, FRSC
Head, Department of Chemistry
School of Physical Science

Speakers:

Dr. M. Ravikanth
Professor
IIT-Bombay, Mumbai

Dr. L. Giribabu
Senior Principal Scientist
CSIR-IICT, Hyderabad

Dr. Pradeepta K. Panda
Professor
University of Hyderabad

Dr. Iti Gupta
Associate Professor
IIT-Gandhinagar

Dr. M. Sankar
Associate Professor
IIT-Roorkee

Dr. Raghu Chitta
Assistant Professor
NIT-Warangal

Dr. Gokulnath Sabapathi
Assistant Professor
IISER-Trivandrum

Dr. S. Prasanthkumar
Assistant Professor
DST-Inspire Faculty
CSIR-IICT, Hyderabad

Dr. Masatoshi Ishida
Assistant Professor
Kyushu University , JAPAN

Dr. Prashanth P.
Assistant Professor
Uni. of Minnesota, USA

FREE Registration https://tinyurl.com/y37drhol

Meeting links will be shared separately to the registered participants

What more?
- ✓ **Best poster/flash presentation award**
- ✓ **Active participant award**
- ✓ **Overall active participant award**

The young researchers can present your work by submitting an abstract of your poster/flash presentation

https://tinyurl.com/y38tj9rh

Convener
Dr. Ravi Kumar Kanaparthi
Assistant Professor
Central University of Kerala
Kasaragod

Student Volunteers
Akhila M.
Manjeev Singh
Akshaya E.
MSc Students

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e-Certificate to ALL the registered and attended participants

Virtual Conference *on*

Recent Advances in *bis* and *tetra*-Pyrrolic Molecular Materials

Organized by

Department of Chemistry, School of Physical Sciences, Central University of Kerala

Inauguration

24th August, 2020; 10.00 – 10.45 a.m.

Welcome Address

Dr. Ravi Kumar Kanaparthi
Assistant Professor
Convener

Inauguration

Prof. (Dr.) H.Venkateshwarlu
Hon'ble Vice Chancellor
Central University of Kerala

Presidential Address

Prof. (Dr.) M. R. Prathapachandra Kurup
Dean, School of Physical Science
Department of Chemistry

Felicitation

Prof. (Dr.) A. Sakthivel
Head, Department of Chemistry
School of Physical Science

Vote of Thanks

Dr. M. Bhagiyalakshmi
Assistant Professor, Department of Chemistry

Google Meet Link: https://meet.google.com/zsj-pwto-hep

All are welcome

CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF CHMEISTRY

Virtual Conference
on

Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials

24-26th, August 2020

Good Practices to Attend Virtual Conference

1. Please ensure that your Mobile/laptop/desktop fully charged before attending a conference session. Login the conference room at least 10 minutes before and wait for further proceedings. LOGIN only with official registered email and don't use any other email. This is a crucial parameter to track your attendance. If you want to change your email, write to us well in advance. Always, MUTE your audio and video.
2. Conference Technical sessions links will be send to both, your email registered with us and WhatsApp group account. There is no other way that we can communicate the conference links. We have already send Links to join in the Conference Google Group and WhatsApp group. If you have any issue to join, contact us by sending a message dcrac2015@gmail.com, rkchem@cukerala.ac.in. DON'T call at any cost as I would be busy in hosting the session, I won't be able to take your call. Moreover, I would be using mobile as HotSpot to host the conference.
3. Avoid writing Greeting Messages like 'Good Morning' and 'Good Evening' in the chat box. Chat box is only meant for asking questions. If everyone start sending greeting message, we afraid the right questions will be buried. If you really want share your thoughts on the conference please don't hesitate to write to us. If you want appreciate speaker, please write to them directly.
4. As we are hosting on GoogleMeet platform, we can accommodate maximum 250 number at a time. If you can't login it could be due to this maximum limitation. Don't worry, go to our YouTube Channel and watch the LIVE lecture. You may pose questions there in the chat box and our moderators will pick up questions and they ask on behalf of you to the speaker.
5. Attendance form will be posted at any time during the session and it will be enabled for 10 minutes. Those who are attending Live YouTube Channel, have to login using Gmail Account with which you registered to the conference and we have a mechanism to track the participant who is watching.
6. Your registration in the conference does not guarantee issuing a 'Participation Certificate. Participation Certificates would be issued only to those who attend all the sessions.
7. We totally understand your Internet Connectivity issues. DON'T worry, those who have technical issues, should watch YouTube Channel videos on the same day at any time.
8. 'Active Participant Award' would be announced every day to those who present all the sessions in a day and asking relevant questions to the speakers.
9. 'Overall Active Participant Award' would be announced on the last day (if not next day) based on the ATTANDNACE and ACTIVELY ASKING RELAVENT QUESTIONS to the speakers.

(Dr. Ravi Kumar Kanaparthi)
Convener

CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF CHMEISTRY

Virtual Conference
on
Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials
24-26th, August 2020

General Instructions for Oral Presentations of the Research Students

1. Since it is a virtual conference, you are advised to make power point presentation of your work.
2. Schedule of oral presentations will be shared separately. All the students presenting one session must be ready in all respects. In case last minute internet failures, the very next person in the order would be called for presenting.
3. Please ensure that your laptop/desktop fully charged before presentation and well connected with high-bandwidth internet. Always better to keep a backup device with you.
4. Send a copy of your presentation to my email (rkchem@cukerala.ac.in) before starting the oral presentation session/break time. It will be used only when there is an issue from your side to open *.ppt* file during the session.
5. Log in to the session at least 10 minutes before and wait. Sit in a clam place while presenting your work.
6. First slide should be an introductory slide which should have a **title of the talk**, **your name**, **supervisor name**, LOGO, Department/School and institution address etc.
7. No limitation on the number of slides, however, avoid large number of slides while making presentation.
8. ***Oral presentation must be finished within 10 minutes. It is highly recommended to practice several times so that your presentation finishes within the time limit in the conference.***
9. It is good habit to introduce yourself briefly to the participants while giving presentations.
10. Don't waste your time in discussing literature and introduction.
11. It is recommended to spend more time on experimental section, results and discussion, and conclusion part.
12. Prepare for giving answers to the audience and judges questions.
13. Best few presentations will be given citation/certificate only. As you can notice, this conference is a ZERO budget conference. NO CASH award.
14. ***The oral presentation would be assessed based on organization of slides, presentation of the work, content of work, answering questions etc. and will be up to the discretion of judges. The decision of Judges will be final. Results will be announced in the concluding session itself.***

Dr. Ravi Kumar Kanaparthi
Convener

CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF CHMEISTRY

Virtual Conference
on

Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials

24-26th, August 2020

Programme Schedule

Monday, 24th August 2020 (Day – 1)	
10:00-10:45	**Inauguration of the Virtual Conference**
Technical Session – 1 Moderator: **Prof. A. Sakthivel, (Central University of Kerala)**	
11:30 – 12:10	**IL – 1: Prof. M. Ravikanth, (IIT- Bombay)** "Benzi- & Polyaromatic Heterocycles/Hydrocarbons Embedded Porphyrinoids"
12:15 – 14:00 Lunch Break	
Technical Session – 2 Moderators: **Prof. MR. Prathapachandra Kurup, (Central University of Kerala)** **Dr. Bini George, (Central University of Kerala)**	
14:00 – 14:40	**IL– 2: Dr. Masatoshi Ishida (Kyushu University, JAPAN)** N-Confused Hexaphyrins Serve as Potential Second Near-Infrared Chromophores
14:45 – 15:25	**IL– 3: Dr. Iti Gupta, (IIT-Gandhinagar)** Thioglycosylated porphyrins: Potential theranostic agents for cancer
15:30 – 17:00 Tea Break	
Technical Session – 3 Moderators: **Dr. M. Bhagiyalakshmi (Central University of Kerala)** **Dr. Raghu Chitta (NIT-Warangal)** **Dr. Gokulnath Sabapathi, (IISER-Thiruvanathapuram)**	
17:00 – 18:00	
FL1	**M. B. Mrinalini: (CSIR- IICT, Hyderabad)** Conducting Nanowires: Synthesis, Self-assemly and Electronic Properties of Porphyrin Based Donor-Acceptor systems
FL2	**Sachin Kumar (Delhi Technological University)** Sterically hindered meta-benziporphodimethene molecules as a cell imaging tool
FL3	**Sameeta Sahoo (University of Hyderabad)** Exploration of an unusual mode of complexation of platinum(II) ion in naptho-fused bipyrrole derived prophycene
FL4	**Jibin Alex Abraham (Kyushu University, JAPAN)** Synthesis and Characterization of n-fused porphyrin iridium complexes towards catalysis
FL5	**Suneel Gangada (Central University of Rajashthan)** Synthesis and Photophysical studies of Donor–Acceptor-Type Near-Infrared (NIR) Absorbing Bis(4′-tert-butylbiphenyl-4-yl)aniline – Aza-borondipyrromethene (Aza-BODIPY) Dyes
FL6	**Anu (IIT-Gandhinagar)** Pd(II) porphyrins for Singlet Oxygen Generation and Photocatalysis
FL7	**K. Anjali (Central University of Kerala)** Rhodium-porphyrins complexes: preparation, heterogenization & its catalytic application for hydrogenation of biomass model compound
FL8	**Jyotsna Bania (University of Hyderabad)** A Novel porphyrin-bodipy conjugate with panchromatic absorption for DSSC

Tuesday, 25th August 2020 (Day – 2)	
Technical Session – 4 Moderators: **Dr. P. Raghavaiah,** Central University of Karnataka **Dr. Deepa Janardanan,** Central University of Kerala	
10:30 – 11:10	**IL – 4: Dr. L. Giribabu, (CSIR-IICT Hyderabad)** "Porphyrin Based Dyes for Dye-Sensitized Solar Cells"
11:15 – 11:55	**IL – 5: Dr. Gokulnath Sabapathi, (IISER-Thiruvananthapuram)** Synthesis, electronic and sensing properties of Carbazole-embedded porphyrin-like structures and di-m-phenylene incorporated expanded porphynoids
12:00 – 13:30 Lunch Break	
Technical Session – 5 Moderator: **Dr. M. Shivaprasad, (Central University of Tamil Nadu)**	
13:30 – 14:10	**IL– 6: Dr. Raghu Chitta, (NIT-Warangal)** Light Induced Energy and Electron Transfer Events in Borondipyrromethene Based Donor-Acceptor Systems
Technical Session – 6 Moderators: **Prof. A. Sakthivel, (Central University of Kerala)** **Dr. Raghu Chitta, (NIT-Warangal)** **Dr. Gokulnath Sabapathi, (IISER –Thiruvananthapuram)** Flash Presentations by Research Scholars and Post-Doctoral Fellows	
14:15 – 15:45	
FL-9	**Jaydeepsinh Chavda (III-Gandhinagar)** NIR BODIPYs: Synthesis and Biological Studies
FL-10	**Koteshwar Devulapally (CSIR-IICT, Hyderabad)** Imidazole substituted Porphyrin Sensitizers for Dye-Sensitized Solar Cell Applications: Effect of p-methoxyphenyl group
FL-11	**S.S. Sreejith (IISER-Kolkata)** DFT Study on The Mechanism of The Electrochemical Reduction of CO_2 to Ethanol Catalyzed By Cobalt Corrole.
FL-12	**Deepali Ahluwalia Delhi (Technological University)** Effect of substitution on Geometry and Intramolecular Hydrogen-Bond Strength on meta-benziporphodimethenes: a new porphyrin analogue
FL-13	**Sipra Sucharita Sahoo (University of Hyderabad)** Synthesis of naptho-fused oligopyrrolic helicates
FL-14	**Ruth Mariam Ipe, (IISER-Thiruvananthapuram)** Towards Doubly Fused Pyrene Diporphyrin: Synthesis and Preliminary Characterization
FL-15	**PRACHI GUPTA (IISER-PUNE)** Two-electron Oxidation of a Twisted non-anti-aromatic 40π Expanded Isophlorin
FL-16	**Avisikta Sinha: IIT-Bombay** Dibenzothiophene/ Furan Embedded Porphyrinoids
FL-17	**J. Ajay (IISER-Thiruvananthapuram)** Protonation Induced Planarization of Core-Modified [48] Dodecaphyrin(1.0.1.0.1.0.1.0.1.0.1.0)
15:45 – 18:00 Tea Break	
Technical Session – 7 Moderator: **Dr. M. Shivaprasad, (Central University of Tamil Nadu)**	
18:00 – 18:40	**IL– 7: Dr. Prasanth K. Poddutoori (University of Minnesota Duluth, USA)**

	Main Group Porphyrins in Artificial Photosynthesis
18:50 - 18:50 FL-18	**Brandon J. Bayard (University of Minnesota Duluth, USA)** Design, Synthesis and Characterization of Molecular Components For Light Induced Molecular Machines

Wednesday, 26th August 2020 (Day – 3)	
Technical Session – 8 Moderators: **Dr. Ravi Kumar Kanaparthi,** Central University of Kerala **Dr. M. Bhagiyalakshmi,** Central University of Kerala	
10:30 – 11:10	**IL – 8: Prof. Pradeepta K. Panda, (University of Hyderabad)** Tuning the Porphycene Macrocycle - A Porphyrin Isomer
11:15 – 11:55	**IL – 9: Dr. M. Sankar, (IIT-Roorkee)** Synthesis and Applications of Meso/β-Functionalized Porphyrinoids
12:00 – 13:30 Lunch Break	
Technical Session – 9 Moderator: **Dr. Bini George, (Central University of Kerala)**	
14:00 – 14:40	**IL– 10: Dr. Prasanthkumar S (CSIR-IICT, Hyderabad)** Porphyrin Based Self-Assembled Nanostructures for Organic Electronics
Technical Session – 10 Moderators: **Dr. Deepa Janardanan, (Central University of Kerala)** **Dr. Raghu Chitta, (NIT Warangal)** **Dr. Gokunath Sabapathi, (IISER-Thiruvananthapuram)** Flash Presentations by Research Scholars and Post-Doctoral Fellows	
14:45 – 15:45	
FL-19	**Govind Reddy (CSIR-IICT, Hyderabad)** Phenothiazine tethered porphyrin analogous as a hole transporting material for printable perovskite solar cells
FL-20	**A. Kalaiselvan,** Synthesis, Structure and Anion Binding Studies Of N-Confused-Like Porphyrinoinds Embedded With Carbazole Subunit
FL-21	**J. Nagamaiah (University of Hyderabad)** 3,6,13,16-Tetrapropylporphycene: Positional Effect of Propyl Group Towards Design and Control of Structural and Photophysical Properties
FL-22	**Kolanu Sudhakar (University o Hyderabad)** Corroles in electrocatalytic proton reduction
FL-23	**T. Sulfikarali (IISER-Thiruvananthapuram)** Synthesis, Structure and Electronic Properties Of P-Phenylene Embedded Cyclotrimer And Cyclotetramer
FL-24	**Nithya Mohan (CUSAT-Kochi) - 5 minutes** Effect of Structural Tuning to Enchance The Nonlinear Optical Response of Salen Type Ni(Ii) Compounds.
FL-25	**Shinto Varghese (Mar Thoma Collge, Tiruvalla) - 5 minutes** Adsorption of Methylene Blue on Silica Synthesized from Different Sources
FL-26	**Gutti Pavan (University of Mumbai) - 5 minutes** COVID-19: Attacks the 1-Beta Chain of Haemoglobin and Captures the Porphyrin to Inhibit Human Heme Metabolism

FL27	**Mannarsamy Maruthupandi (IIT-Hyderabad) - 5 minutes** Catalytically active coordination polymer with a tiny Zn_2Se_2 ring bridged by bis-selone
15:45 – 16:30 Tea Break	
17: 30 – 18:15	**Concluding Session & Valedictory Function**

Note:

1. All the Invited Lectures duration will be 40 minutes' followed by 5 minutes' discussion.
2. All the flash oral presentations of young researchers will be 8 minutes' duration, followed by 2 minutes discussion.
3. All the presenting persons are requested to comply with the time for you in order to conduct the program smoothly on time.

Inauguration of Virtual Conference
on
Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials
Date & Time : 24-26th August, 2020 (10:00 – 10.45 am)

University Anthem

Welcome Address
Dr. Ravi Kumar Kanaparthi
(Assistant Professor & Convener of the Virtual Conference)

Felicitation
Prof. (Dr.) A. Sakthivel
(Head, Department of Chemistry)

Presidential Address
Prof. (Dr.) MR Prathapachandra Kurup
(Dean, School of Physical Sciences & Director of Director of Research, CUK)

Inauguration

Prof. (Dr.) H. Venkateshwarlu
Hon'ble Vice Chancellor, Central University of Kerala

Vote of Thanks

Dr. M. Bhagiyalakshmi
(Assistant Professor, Department of Chemistry)

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8/15/2020 9:56:50	jinomath@gmail.com	Mr
8/15/2020 9:57:57	kuntalkoley97@gmail.com	Mr
8/15/2020 10:00:39	nimishasasikumar50@gmail.com	Ms
8/15/2020 10:00:49	sreekanth7036@gmail.com	Mr
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ANJANA P NAMBIAR	Research Scholar
HARIET JACKSON	BSc
SHINTU VARGHESE	MSc
JYOTI RAJ	MSc
Ankit GHOSH	MSc
ANJAL JOSEPH P	MSc
ATHIRA N	Research Scholar
VISHAK V	BSc
ALEENA CARMEL NORONHA	BSc
BISWAJIT HALDER	BSc
Dhia Binoj	BSc
PRANAV B NAIR	BSc
SUBHABISHNU TRIPATHY	BSc
RAMASHISH KUMAR	MSc
ANJITHA K.J	MSc
LEKSHMI DHARMAN	BSc
MAHESH M L	MSc
SREELEKSHMI B	MSc
SUKANYA DUTTA	BSc
SUMONA KUMAR	BSc
VIJINIGIRI RAGHAVENDRA	MSc
POULAMI BANERJEE	MSc
SUNANDO SANTRA	BSc
SRIJAN SEN GUPTA	MSc
NANDAN SARKAR	MSc
Smrithi S Babu	MSc
BHUVANESWARAN	MSc
SOMA SIL	MSc
A.Suhasini	Assistant Professor
Abhishek Anil Nair	MSc
Manjeev Singh	Research Scholar
SEENA SEBASTIAN	BSc
SOURAV DAS	MSc
Dr. Wasudeo Balaji Gurnule	Associate Professor
CH SIVA NAGA SAI	MSc

Souren Mondal	BSc
UMADEVI A. G	Assistant Professor
S SHABANA	BSc
KANCHANA N KRISHNAN	MSc
Erin Ann Sunny	BSc
DEEPA. A.V	Research Scholar
Geethukrishnan	MSc
RAGESHREE DASH	BSc
AKSHAYA E	Research Scholar
Sindhu. T. K	Associate Professor
Sameeksha goswami	MSc
vishnu mishra	Research Scholar
SURABHIDEVI S	MSc
SABRINA SAJJAD	Research Scholar
KALAISELVAN A	Research Scholar
SANTHOSH PAUL	Assistant Professor
JITHUKRISHNAN R G	MSc
SREELEKHA U	MSc
A. PALANIMURUGAN	Assistant Professor
KIRANRAJ B	MSc
SREENAVYA A	Research Scholar
SHERIN JOHN	MSc
ARINDAM KUNDU	BSc
JISHNU GOPAL P	MSc
ALKKA SABU	BSc
DAMBARUDHARA BEHERA	BSc
AVISIKTA SINHA	Research Scholar
GREESHMA. V	Research Scholar
TARUN JANA	MSc
AATHIRA EDWIN	Research Scholar
Muneshwar Nandeshwar	Research Scholar
SRIJON SEN	BSc
DARSANA E	MSc
Shijina S S	Research Scholar
DEEPA R DAS	MSc
SOURAV SIL	MSc
BAPPA SINGHA	MSc
SOUMEN KHAN	MSc
Dr.V.RAMESHKUMAR	Assistant Professor
SUBHRA SIL	MSc
AMITH G ANIL	Research Scholar
Saikat Dasgupta	MSc
ANJUL DADORIA	Research Scholar
PRASHANTH K. PODDUTOORI	Assistant Professor
ANWESHA BERA	MSc
MADHAVARAO VALLABHANENI	Associate Professor
FUTTI.PAVAN	Research Scholar
SWAGAT KUMAR NAYAK	MSc
Y RANGANAYAKULU	Assistant Professor
ARCHANA V P	Assistant Professor
Muhammad Saqib	Research Scholar
FATHIMA MUHAMMED	MSc
SREENIVASAN. K. P	Assistant Professor
SUMAN MONDAL	BSc
FATIMA ZOHRA ZEGGAI	Research Scholar
VALLE RAMADEVI	Assistant Professor

POOJITHA DASI REDDY	MSc
NIGAM KUMAR	MSc
ATANU MAJI	MSc
DIOTIMA BOSE	BSc
MANISH KUMAR	MSc
ASHNA GEORGE	MSc
SHAZIYA BEGUM	MSc
SUKANTA PAL	Research Scholar
HARIPRIYA T V	MSc
SUSHMITA GHOSH	BSc
METLAPALLI DURGA ANAND SAIBAB	Research Scholar
SWAPNA PRIYA GANJI	MSc
ANNA MARIA C J	MSc
MANISHA BOSE	MSc
ALEENA SEBI MATHEW	BSc
ASITHA R	BSc
ANU MARIA C D	MSc
ASWANI S	MSc
SHIBU PRASAD S	Assistant Professor
Markose Joshy	Research Scholar
DAMARA SINGU UMA MAHESWARA F	MSc
REMYA CHANDRAN.R.S.	MSc
PROF.K.BASAVAIAH	Professor
P.S.R.VIDYASAGAR.	Assistant Professor
RAMESH NAGESH HIREMATH	Research Scholar
PARAMESWARAN.P.S.	Associate Professor
M.SRINIVASARAO	Assistant Professor
NAVYA.C	Intermediate
MOHAMMED SHANIF KV	Intermediate
ZAKIYYA.P	Intermediate
Kalyani Prasad	Intermediate
SOORYAKEERTHI. P. S	Intermediate
BERRY SHRAVAN	Intermediate
LEKSHMIPRIYA U	Intermediate
Abhijith V	Intermediate
NOORFATHIMA.	Intermediate
RAHUL.K	Intermediate
KUDA ESWARA RAO	Research Scholar
RAJANANDANA.N	Intermediate
MAHIMA GOWRI I S	MSc
Shubhendra shukla	MSc
ATHIRA KM	MSc
Ramesh M	Professor
EMMANIEL RAJU CHITTALA	Research Scholar
PRAGATI SHUKLA	Research Scholar
LEKSHMI J B	BSc
SRIVISHNU K S	Research Scholar
SHILPA RATHOR	Assistant Professor
SREYASI TALUKDAR	BSc
JIJINA K	MSc
KRISHNAPRIYA K	MSc
ANITHA M	MSc
SOORAJ K	MSc
ABHIJITH M V	MSc
RAMLITHIN M C	MSc
APARNA K	MSc

Supreetha Kulala	MSc
ANJITHA P T	MSc
SOMESH BELLANKI	MSc
ANAND P S	Intermediate
ZAAJIL AHAMMED KP	Intermediate
NAVEEN KUMAR	Assistant Professor
Vijendra saini	Assistant Professor
JASEELA M.A.	Assistant Professor
NEHA CHEJARA	MSc
SHREYA	MSc
NISHANA L K	Research Scholar
ATHUL E	MSc
Sudhakar Kolanu	Post-Doctoral Fellow
Deepak kushwaha	MSc
Nosheen baig	Research Scholar
MOHAMMED ABDULLA AK	Intermediate
DEVULAPALLY KOTESHWAR	Research Scholar
NIVEDITA SHARMA	Research Scholar
Pratibha Sharma	Research Scholar
PINKY YADAV	Post-Doctoral Fellow
NIMISHA N P	MSc
RAHUL SOMAN	Post-Doctoral Fellow
ANUPRIYA.S	BSc
ROHINI. S	MSc
ATHIRA B	MSc
ATHULYA P	MSc
KOTESHWAR	Research Scholar
ATHULYA V	MSc
ANJALI K	Research Scholar
B.ANJAIAH	Research Scholar
KIRAN ASOKAN	Research Scholar
Lavanya K	Research Scholar
Gayatri Ghosh	MSc
Raghu Chitta	Assistant Professor
Deepti Chauhan	Research Scholar
LIYA BENNY	MSc
Lekshmi Ajith	MSc
MEGHA MOHAN	MSc
Suhasi kole	BSc
RAMYA A R	Post-Doctoral Fellow
Manju M.J.	Assistant Professor
Madan Digambar Ambhore	Post-Doctoral Fellow
B.Emmanuel	Assistant Professor
MONIKA BAI M G	Research Scholar
Mengistu Mulu Ayele	Research Scholar
RITIKA KUBBA	Research Scholar
SHIKHA RANA	Research Scholar
TEJASWINI BHIVA BHARMAL	BSc
SWAYAMSIDDHA RATH	BSc
JYOTI	Research Scholar
CHIDANAND YALLAPPA NIDAGUNDE	MSc
SHIFA N	MSc
Ahsana PM	MSc
ROHINI V NAIR	MSc
RITHIKA RAMESH	Intermediate
PRACHI GUPTA	Research Scholar

M. B. MRINALINI	Research Scholar
SOWJANYA GUNDALA	MSc
DEEPALI AHLUWALIA	Research Scholar
NANDU P	MSc
JIBIN ALEX ABRAHAM	Research Scholar
SAMEETA SAHOO	Research Scholar
Iti Gupta	Associate Professor
SNIGDHAMAYEE RANA	Research Scholar
JYOTSNA BANIA	Research Scholar
PREETI KUMARI	MSc
JAYDEEPSINH CHAVDA	Research Scholar
Anu	Research Scholar
M. RAVIKANTH	Professor
GANGADA SUNEEL	Research Scholar
TEJASWI JELLA	Assistant Professor
Sunitha A	MSc
IPPILI VALLABHARAO	MSc
GOVIND REDDY	Research Scholar
Suman Mandal	Research Scholar
NIKITHA JAGADEESH	MSc
MOHANA A	MSc
LEKSHMI M R	Research Scholar
MELVINA MATHEW	MSc
JODUKATHULA NAGAMAIAH	Research Scholar
SEENA.T.X.	Assistant Professor
Dr VIRUPAKSHI PRABHAKAR	Assistant Professor
VIJESH A M	Assistant Professor
Dharmasoth Rama Devi	Research Scholar
Sipra Sucharita Sahoo	Research Scholar
SREELAKSHMI K M	MSc
PRASANT BEHERA	Research Scholar
DR. K. RAJU	Assistant Professor
PRIYA PAUL	MSc
NIKHILA. P. M.	MSc
POORNENTH PUSHPANANDAN	Post-Doctoral Fellow
VIDYAGHOSH A	BSc
Boddu Venkateswar Rao	Associate Professor
SANAT KUMAR MAHAPATRA	MSc
ATUL VARSHNEY	Research Scholar
K.SAVITHRI	Assistant Professor
Vishnu A.P.	BSc
RAJU TANTRAVAHI	MSc
Ravada Kishore	Assistant Professor
AISWARYA PURUSHOTHAMAN	Research Scholar
MANNE NAGA RAJESH	Research Scholar
PRAMOD KUMAR M	Research Scholar
P. SUNITHA MANJARI	Assistant Professor
AMINA MARZEENA S	MSc
SAJITH N V	Research Scholar
SACHIN KUMAR	Research Scholar
PEEHU SHARMA	MSc
Delna TS	MSc
BRANDON BAYARD	MSc
JOSSIN GEORGE	MSc
ANUSREE C	MSc
ASWIN P	Research Scholar

BARTHOLOMEW RICHARD	BSc
SREELEKHA E	Research Scholar
Aishi Mitra	MSc
NEETHU P P	Research Scholar
RAVEENA VENUGOPAL	MSc
Sarath Babu badugu	MSc
KAVYA P	MSc
ATHIRA S BABU	MSc
Athira S Babu	MSc
ANIRUDH KESAR	MSc
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RUTH MARIAM IPE	Research Scholar
RAVIKUMAR K	MSc
Laina A L	Assistant Professor
RUTH MARIAM IPE	Research Scholar
Shalini Dyagala	Research Scholar
ANNMARY ANTO	MSc
GAYATHRI B H	Assistant Professor
SHRUTHI N	Assistant Professor
KULSOOM KOSER	Research Scholar
ARSHA MARIA CHERIAN	MSc
MALAVIKA G.	MSc
Gandi Chandra sekhar	Associate Professor
GREESHMA ROY	MSc
SUNEEL KANAPARTHY	Assistant Professor
AJAY J	Research Scholar
Sulfikarali Thondikkal	Research Scholar
GOTTIMUKKULA SHIREESHA	BSc
B Shivaprasad Achary	Post-Doctoral Fellow
G. CHANDRA SEKHARA RAO	Assistant Professor
Sagarika Roy	MSc
Mohd Umar	BSc
SATYAJIT SAHOO	MSc
Mrs.M.SOWMYA	Assistant Professor
VAMSI KUMAR YAGATI	Associate Professor
ABHISHEK BHUSHAN	BSc
AMITHA ANTONY	BSc
FATIMA S HANANA	BSc
Vidhi Sharma	BSc
V V T SESHASRI	Assistant Professor
RESMIRAJ A R	BSc
MEENAKSHI RAINA	BSc
DIPIKA SHEE	BSc
PICHIKA VENKATA SATYAJI	Assistant Professor
P BHARATH	MSc
JAGRUTI RAJENDRA NAVALE	BSc
P BHARATH	MSc
AINA S RAICHAL	BSc
Ojassavi Mahajan	BSc
SUJATA KUNDAN	Assistant Professor
PRIYA KHANNA	BSc
VYSHNAVI S GOPAN	Intermediate
TINCY K A	MSc
G. HIMA BINDU	Assistant Professor
ATHIRA A	BSc

SHIVRATAN	BSc
SABBAVARAPU SURIBABU	Assistant Professor
AMITU SHARMA	BSc
VISHNUVARDHANTUMMANAPELLI	MSc
CHRISTO ADOLF	Intermediate
KANNA DIVYA	MSc
Biswajit Behera	BSc
MANASI DALAI	Post-Doctoral Fellow
BONA ELIZEBATH BABY	MSc
PINJARI JEMILA	MSc
Dr Naga Sai Kumar Tirthala PhD (NIT W	Assistant Professor
POTTURI RAMA DEVI	Assistant Professor
MUNA NAYAK	BSc
VENKATESAN M	Research Scholar
PRAGATI SHARMA	Research Scholar
PARVATHI RAJEEV	MSc
Dr.T.Sarojini, Ph.D, NIT, Warangal	Professor
PARAMITA GHOSH	BSc
FATHIMA MEHJABIN P	BSc
SANDRA K. F	BSc
Asha Raveendran	MSc
APARNA P	MSc
MANJUSHREE BK	MSc
AISWARYA K	BSc
NAGA BHAVANI VADREVU	Research Scholar
ANJITHA V K	BSc
SANJAY KUMAR R	MSc
ALEENA UNNIKRISHNAN	BSc
MASRAT AHMAD WANI	BSc
ASWANI E V	BSc
KAMAT VISHAL VINAYAK	MSc
Komal Gupta	Assistant Professor
Achu Paul K	MSc
RAJAT KUMAR	BSc
BIJU BASUMATARY	Post-Doctoral Fellow
SASWATI ADHIKARY	Research Scholar
A.SUHASINI	Assistant Professor

Name of College/University/Institute	Mobile Number (WhatsApp
Central University Of Kerala	9490364944
Central university of Kerala	9400529683
CENTRAL UNIVERSITY OF KERALA	8078122933
KUNTAL KOLEY	7003967334
Central University of kerala	9497467967
Central university of kerala	7799210611
Central University of Kerala.	7356498037
Maharaja’s College, Ernakulam	9446296572
Central university of kerala	8943721404
S N College Kollam	9895037056
Sree Neelakanta Govt Sanskrit College Pattambi Kera	9539787055
Central University of Kerala	7909173069
CENTRAL UNIVERSITY OF KERALA	9061287920
Central University of Kerala	9995337708
S N COLLEGE, KOLLAM	8281491552
Central University of Kerala,Kasargod	8137089286
Sree Narayana College Kollam	7306314885
Central university of kerala	7306457909
St aloysius college Elthuruth, Thrissur	9349815071
CENTRAL UNIVERSITY OF KERALA	8547209675
IIT madras	9656661553
IIT Hyderabad	9178310454
Central University of Kerala	9048625698
CENTRAL UNIVERSITY OF KERALA	9497879525
Indian Institute of Technology Hyderabad	8695766759
Central University of Kerala	9495726836
IIT Hyderabad	7575926723
Indian institute of Science Education and Research (II	9567813008
central university of kerala	9745723616
Central university of Kerala	7306161413
Christ College (Autonomous) ,Irinjalakuda	9895592695
Central University of Kerala	9747803086
Central University of Kerala	9745616928
Vellore institute of technology Chennai	8378977981
University of calicut	8086908654
Indian institute of technology, Hyderabed	9003400647
Central University of Kerala	9544015198
ANJANA P NAMBIAR	9496511295
IITH	9952630813
Central University of Kerala	8078849434
PG department of Patliputra University Patna Bihar	7283034933
St. Joseph's college for women, Alappuzha	8138834396
AN College Patna	9534623450
LADY BRABOURNE COLLEGE	9748633559
St.Joseph's College ,Devagiri	9188213109
Bapatla Engineering College	8106618197
IISER-TVM	+918089738293

Jadavpur University	6292216732
RAMAKRISHNA MISSION VIVEKANANDA CENTEN/	8617262329
St Berchman's College Changanassery Kerala India	9495749123
Sree Narayana College For Women, Kollam, Kerala	8547396914
Mar Ivanios College,Nalanchira,Thiruvananthapuram	9745465667
Nayagarh autonomous College	9348252389
BHARATHIYAR UNIVERSITY	9003773973
Sree Narayana College For Women,Kollam	8078226703
Maharaja's college	9846668466
UTKAL UNIVERSITY	+918594812615
RGUKT A.P IIIT RK VALLEY IDUPULAPAYA	9581078119
Cochin University of Science and Technology (CUSA	8281911210
MAR IVANIOS COLLEGE	7902311790
AISWARYA P	7736173386
JNTUA	9652696574
Government College for Women,Thiruvananthapuram	7306895862
Seth Anandram Jaipuria College	7449414464
Lady Brabourne College	8429821357
Calcutta University	08282843537
RAJABAZAR SCIENCE COLLEGE, UNIVERSITY OF	8282884720
Yogi Vemana University	6303991743
IISER THIRUVANANTHAPURAM	9567663033
St Joseph's College For Women	8590492185
Mar Thomas College,Thiruvalla	8113037031
CENTRAL UNIVERSITY OF KERALA	9668625178
Dr. Harisingh gour viswavidyalaya (a central university	7685918535
St.Aloysius college Elthuruth	8304926225
IISER -THIRUVANANTHAPURAM	8921791291
Mar Ivanios college	9388750598
St. Joseph's college for women Alappuzha	9025660879
Dinabandhu Andrews College	8777253711
St Joseph's College Devagiri	7593920282
Mar Ivanios College Thiruvananthapuram	8590905528
Nayagarh Autonomous college,Nayagarh,Odisha	9348698925
PG DEPARTMENT OF PATLIPUTRA UNIVERSITY F	9097151353
The cochin college	9061977828
SREE NARAYANA COLLEGE FOR WOMEN	7994967495
Central university of kerala	9567833246
T.K Madhava Memorial college,Nangiarkulangara	9387438561
UNIVERSITY OF CALCUTTA	9088857784
New Alipore College	7003026717
M.R.P.G COLLEGE,VIZIANAGARAM	8008490370
University Of CALCUTTA	9073767999
CITY COLLEGE	7980144308
University of Hyderabad	8584034359
VIDYASAGAR UNIVERSITY	8345947215
Central University of Kerala	8593902847
CENTRAL UNIVERSITY OF KERALA	8124755832
Rajabajar Science College, University Of Calcutta	9088339934
St.Xaviers Catholic College of Engineering	9443088823
Central University of Tamil Nadu	7012214546
Central University of Kerala	7907601248
St.Joseph's College for Women,Alappuzha	7558859960
Ramakrishna Mission Residential College (Autonomo	9674490070
Kamla Nehru Mahavidyalaya Nagpur	9096672499
MVR PG COLLEGE.	7659937397

City college	9932869760
N. S. S. College, Cherthala	9846967476
MSM college KAYAMKULAM	9947860016
Central university of kerala	9847988623
Mar Ivanios College,Trivandrum	8086704864
Central University of Kerala	09961069033
Carmel college mala	8156846512
Nayagarh autonomous college nayagarh	8457994108
CENTRAL UNIVERSITY OF KERALA	8301820431
University College	9495352540
Sameeksha goswami	07566894249
IISER PUNE	6394539225
CENTRAL UNIVERSITY OF KERALA	7306301397
University of Azad Jammu and Kashmir Muzaffarabac	3211500757
IISER-TVM	8089738293
Sacred Heart College Chalakudy	9497249176
Central University Of Kerala	8921394010
Central University of kerala	8304969959
Raja Doraisingam Government Arts College, Sivagan	9789186683
Central university of kerala	7510868990
CENTRAL UNIVERSITY OF KERALA	08547306239
St.Aloysius College	9567556808
ASUTOSH COLLEGE	9775076035
Central University Of Kerala	9656563768
St Joseph's College Devagiri	9072834854
Nayagarh Autonomous college,Nayagarh, Odisha, Inc	7653959345
IIT BOMBAY	7045574351
AVHSS ponnani	8943331614
Institute Of Science , Banaras Hindu University.	9641538892
IISER- Thiruvananthapuram	9495517022
IIT Hyderabad	9823749125
RAMAKRISHNA MISSION VIVEKANANDA CENTEN/	9748863769
Central university of kerala	9496500211
NITC	9496805265
Centeal University Kerala	9539023217
VIDYASAGAR UNIVERSITY	9073331473
BAPPA SINGHA	8116821733
VIDYASAGAR UNIVERSITY	9733056500
Dept of Tamil, Central University of Tamil Nadu Thiruv	9443190892
PRESIDENCY UNIVERSITY, KOLKATA	9073331472
Indian Institute of Science	9400440101
Ramakrishna Mission Residential College Narendrapu	8335026580
Sadhu Vaswani Autonomous College Bairagarh, Bhop	8517959037
University of Minnesota Duluth	2189402101
CALCUTTA UNIVERSITY BALLYGUNGE SCIENCE (	07044654624
BAPATLA ENGINEERING COLLEGE	9440484238
University of Mumbai	7021836375
Khallikote Autonomous College, Berhampur	7894843339
Chalapathi institute of engineering and technology	9505594234
Govt. College Attingal	8547135746
COMSATS university islamabad	03248508142
CENTRAL UNIVERSITY OF KERALA	9207007145
MES Kalladi College Mannarkkad	9947753498
Serampore College	7548923863
Center of scientific and technical research in physicoc	2.13551E+11
VALLE RAMADEVI	8008495052

Yogi Vemana University Kadapa	9849670264
A.N. College Patna	9801353381
CALCUTTA UNIVERSITY	7450832853
Scottish Church College	9674904306
A N College Patna Bihar	9608979594
Central University of Kerala	9447660301
A.N college patna	8969367894
Sidho-Kanho-Birsha University	8101949705
Central University of Kerala	9496527628
bethune college	9432613384
University of Hyderabad	9493434393
C.R.college	9553111373
St. Aloysius College, Elthuruth, Thrissur	8330824230
Calcutta University	8777896466
ST JOSEPH'S COLLEGE FOR WOMEN,ALAPPUZH/	9074940675
SNCW KOLLAM	9495674656
CENTRAL UNIVERSITY OF KERALA	9497480232
Central University of Kerala, Kasaragod	9447412680
Government College for Women, Thiruvananthapuran	9446420367
IISER Pune	7030157188
ANDHRA UNIVERSITY COLLEGE OF SCIENCE ANI	7660838829
SNCW, KOLLAM	9567783710
Andhra University	9908036203
ADIKAVI NANNAYA UNIVERSITY.	9949484079
RAMESH NAGESH HIREMATH	08275454224
Sanatana Dharma College, Alappuzha, Kerala	9495738778
Government Degree College Palakonda Srikakulam d	9704555207
GHSS KUNDAMKUZHY	7559093766
PPMHSS KOTTUKARA	7306801631
government girls higher secondary school , thalassery	9946215338
GHSS,Mullassery	9495954866
SN HSS Irinjalakkuda	9495881906
GMBHSS HARIPAD	9207626528
MHSS Puthenkavu	7025437698
St. Mary's H S S Vellaramkunnu	8606474150
ST.THERESA'S BETHANY CONVENT HSS.CHENG/	7510848706
EMEA HSS KONDOTTY	7025616017
Andhra university , South campus ..Dept.of .Inorganic	09494188302
Cherupushpam higher secondary school, Vadakkench	9447620634
Central university of kerala	9061714192
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY ,	6388545957
ST ALOYSIUS COLLEGE ELTHURUTH	9061298596
Omega college of pharmacy, Hyderabad	9542200332
Indian Institute of Chemical Technology(IICT) -Hydera	9701855553
IISER Pune	9598527966
Sree Narayana College for Women ,Kollam	9495969578
CSIR IICT	7795659338
Government P. G. College Rampura Dist:- Neemuch (	7049549876
Seth Anandaram Jaipuria College (University of Calcu	9674268439
Swami Ananda Theertha campus,Kannur university,P	7560922067
SDM PG Centre(autonomous),Ujire,Karnataka	8547099366
SHREE DHARMASTHALA MANJHNATHESWARA C	7510135654
SDM COLLEGE (AUTONOMOUS) UJIRE MANGALC	9539175064
SDM College, Manglore University	8157803045
SDM college, ujire	9544533312
SDM (Autonomous) College Ujire	6238715019

SDM Post Graduation Center, Ujire.	8296304975
Sdm college	8606228580
SDM PG COLLEGE autonomous ujire	9148119475
GHSS Vellur	9496868015
PPMHSS KOTTUKKARA	9846343458
SDM College(Autonomous),Ujire DK 574240	9964073856
Smt. Kunani devi mahila p.g. college,nawalgarh	09468827554
M E S Keveeyam College, Valanchery	8129940593
IIS (deemed to be) university, jaipur ,rajasthan	9461022253
Shri Dharmasthala Manjunatheshwara College(Auton	8548072146
Central University of Kerala	8113991135
SDM COLLEGE (AUTONOMOUS)	9895919540
School of Chemistry, University of Hyderabad	9160567368
Deepak kushwaha	07233015415
Iis deemed to be University Jaipur	7737260624
Durga HSS Kanhangad , Kasargod	9400525328
CSIR-IICT	9959190294
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MG COLLEGE, TRIVANDRUM	9562836844
SNCW, KOLLAM	8136993771
Sree narayana college for womens kollam	9744963528
S. N. C. W. Kollam	9847849968
CSIR-IICT	9959190294
SNCW Kollam	9207325220
CENTRAL UNIVERSITY OF KERALA	9207367069
NIT WARANGAL	7780232011
National Chemical Laboratory	8943316855
CSIR-National Chemical Laboratory, Pune	9847566605
MPC autonomous college,baripoda	8594974803
National Institute of Technology Warangal	8290529060
Delhi Technological University, Delhi	9667707017
CTE,Tripunithura	9447108490
College of teacher education Tripunithura	9072443897
College of Teacher Education , Tripunithura	9946372035
Singur government General Degree college	7044608745
IICT, Hyderabad	9949576347
VTMNSS College, Dhanuvachapuram	8281495910
IISER, Pune	8888161570
RGUKT AP IIIT , Rkvalley , idupulapaya	8142656840
IIT DHARWAD	8310640337
Andhra University	+919133235648
Delhi Technological University	8377991846
Delhi Technological University	8700936101
VG vaze college	9004000239
Nayagarh autonomous college	7735487105
Delhi Technological University	08168721624
SDM College (Autonomous) Ujire	8867827422
MES Kalladi College Mannarkkad	8281723326
MES kalladi college mannarkkad	8301929804
MES Kalladi College Mannarkkad	9846671822
KENDRIYA VIDYALAYA KELTRON NAGAR	9400517452
IISER PUNE	7838724229

CSIR-INDIAN INSTITUTE OF CHEMICAL TECHNOL	9502056996
Acharya Nagarjuna University	8142964861
DELHI TECHNOLOGICAL UNIVERSTY	9654919136
Central university of kerala	9744415304
Kyushu University	9.19495E+11
UNIVERSITY OF HYDERABAD	9581438660
IIT Gandhinagar	9925479623
NIT Rourkela, Odisha	7751836600
UNIVERSITY OF HYDERABAD	9581129628
The IIS (deemed to be) University	9416511938
IIT GANDHINAGAR	7069030194
IIT Gandhinagar	8222830105
IIT Bombay	9819084270
CENTRAL UNIVERSITY OF RAJASTHAN	9610332606
Anurag University	9494465844
Shri Dharmasthala Manjunatheshwara College(Auton	7022912956
Acharya Nagarjuna University	9618825638
RMIT University, Melbourne, Australia.	9849292662
Indian Institute of Technology, Hyderabad	9875396405
Central University Of Kerala	9526922708
Central University of Tamilnadu	6379011876
Department of Chemistry, University of Kerala	9447560134
St. Aloysius College, Elthuruth	9745800320
UNIVERSITY OF HYDERABAD	+919550934294
CBF, Thumburmuzhy	9495539063
RGUKT-IIIT-ONGOLE	08328593878
Payyanur College, Payyanur	9447490909
Andhra university	9398912208
University of Hyderabad	9581386080
St.Aloysius College, Elthuruth, Thrissur	9946478229
UTKAL UNIVERSITY	8917512440
Satavahana University,Karimnagar	9948432989
IIT Kharagpur	9073409584
Central university of Kerala	9526070248
IIT BOMBAY	09895925253
Sree narayana college for women kollam	7025210225
Anurag University	09848461321
DEPARTMENT OF CHEMISTRY,UTKAL UNIVERSIT	9777369007
ATUL VARSHNEY	07417387839
Satavahana university karimnager	9515738266
Mahathma Gandhi College Thiruvananthapuram	9895443142
MR PG College	9182443130
GITAM (Deemed to be University)	9848774331
CENTRAL UNIVERSITY OF KERALA	9496081992
CSIR-IICT	9989952360
CENTRAL UNIVERSITY OF KERALA	9633491580
University College of Science, Saifabad, Osmania Uni	9959968432
Central University of Kerala	6282565204
Central University of Kerala	9544116225
DELHI TECHNOLOGICAL UNIVERSITY	9971971662
Central University of Jammu	9469322781
St.Joseph's College Devagiri Calicut	9961706859
University of Minnesota Duluth	7158174163
ST.BERCHMANS COLLEGE (AUTONOMOUS) CHA	9495696238
Central University of Kerala	7034984854
CENTRAL UNIVERSITY OF KERALA	9645232475

Fatima Mata National College	9446639002
CENTRAL UNIVERSITY OF KERALA	9744059455
University of Hyderabad	7044938990
Central university of kerala	9964310958
St Joseph's College Devagiri	9048236091
Svrm college	8885207103
Central university of kerala	8301867374
ATHIRA S BABU	+918547834422
CUSAT	9446455205
Central University of Jammu	09858514011
CSIR-NCL	9048825526
Central University of Kerala	9048137696
IISER-THIRUVANANTHAPURAM	8860682211
CENTRAL UNIVERSITY OF KERALA	+918220606787
Sacred Heart College, Chalakudy	8281081399
IISER- Thiruvananthapuram	8860682211
University of Hyderabad	09603410105
CENTRAL UNIVERSITY OF KERALA	9496093583
BMS COLLEGE FOR WOMEN	7760451556
Ramaiah college of Arts, Science and Commerce	8762199828
Jamia Millia Islamia University	6005252949
Central University of Kerala	8848782580
Baselius college , Kottayam, Kerala	8304945849
GDC,Puttur	9398438169
Baselius College , Kottayam	9961538875
Central University of Karnataka	9550619817
IISER-THIRUVANANTHAPURAM	9847355734
IISER Thiruvananthapuram	9036202284
Mjptbcwrdc ,wargal	9515396960
University of wroclaw	09603763930
M. R. COLLEGE (A)	9494208094
University of Hyderabad	8794671455
Central university of jammu	8082605225
Utkal University,Bhubaneswar	6370298685
MR(A) college	8074188498
MR College (A), Vizianagaram	9849509244
Central University Jammu	6006141768
St Joseph's College Devagiri	9526470203
STJOSEPH'S COLLEGE FOR WOMEN'S ALAPPUZH	7306640754
Central University of Jammu	9796644859
M.R.college (AUTONOMOUS)	9908324685
MG College TVM	7306905910
Central University of Jammu	6006139968
Asutosh College	8617262425
Government College (Autonomous) RAJAHMUNDRY	9395381133
Govt degree and Pg college puttur	7702850098
MUMBAI UNIVERSITY	9702324566
GOVT. DEGREE & PG COLLEGE PUTTUR.	7382075615
MAR IVANIOS COLLEGE NALANCHIRA THIRUVAN	6282463032
Central University Of Jammu	9682687324
Central University of Jammu	9906082042
Swami sharddhanand College Delhi University	8076266349
Sree Narayana College for Women, Kollam	9061357224
Central University of Kerala	7356291289
Andhra University College of Engineering (A), Andhra	9866706605
SNCW Kollam	6235367473

Central University of Jammu	9255573102
M.R.College(A)	9441305417
CENTRAL UNIVERSITY OF JAMMU	9622245909
OSMANIA UNIVERSITY	9666649803
St thomas hss thomapuram	9061607890
Central university of kerala	9121352262
Nayagarh autonomous college	8260643718
University of Hyderabad	9440724140
Govt.college for women Trivandrum	9946706357
University of Hyderabad	8096000013
RGUKT BASAR	8919551830
VIDYA JYOTHI INSTITUTE OF TECHNOLOGY (AUT	9885385849
Nayagarh(autonomous)college,Nayagarh	9861355473
Indian Institute of Chemical Technology	9842028647
IIS (deemed to be) University	9166200783
Sreea Narayana College for women, kollam	7034648784
Guru Nanak Institutions Technical Campus	9866875274
Newalipore college	9432324830
Carmel college Mala,calicut university	7356231339
Carmel college mala	9633990373
Central university of kerala	8086389842
CENTRAL UNIVERSITY OF KERALA	8281754824
Central University of Kerala	9496418633
CALICUT UNIVERSITY	8139087619
NAGA BHAVANI VADREVU	+917396428693
UNIVERSITY COLLEGE TRIVANDRUM	8075208980
Central University of Kerala, Kasaragod.	7259094020
Carmel College Mala	8138836904
Central universiry of jammu	9682641799
Carmel college Mala	7558974792
JSS Banashankari Arts, Commerce & SK Gubbi Scier	9986559017
Dr. Ram Manohar Lohia College of pharmacy	08595393411
Centeral University of Karnataka	8086640255
Central University of Jammu	9086633438
Kyushu University, Japan	+817019428312
CSIR-Indian Institute of Chemical Biology	7980289769
St.Xaviers Catholic College of Enginerring	09443088823

ou are interested to present

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If you are interested to present a poster, title o

SWOT odlf Indian science

Nil

Catalytically active coordination polymer with a tiny Zn2Se2 ring bridged by bis-selone

Adsorption of Methylene Blue on Silica Synthesized From Different Sources

No

Chemical Principals
Bis and tetra prophyl

Molecular chemistry

NA

No

.....

No

Nil

Not Applicable

DIBENZOTHIOPHENE/ FURAN EMBEDDED PORPHYRINOIDS

Nano based drugs to Covid-19

NA

Good

Carbene Chemistry

No
Not yet

No

NA

Advances of bis and tetra
No

No

No

Corroles in electrocatalytic proton reduction

Organic chemistry

A Wide range redox states of expanded porphyrinoids

Nothing

.

Synthesis and Redox Chemistry of Antiaromatic Expanded porphyrnoids

Stimuli Responsive Redox Active Materials Induced Self Assembled Nanostructures for Optoelectronic Applications
Work horse macrocycle,chlorin,corrin and corphin pyrrolic molecular meterials
Effect of substitutions on Geometry and Hydrogen-Bond Strength on meta-Benziporphodimethenes: a new porphyrin ar

Synthesis and Characterization of N-Fused Porphyrin Iridium Complexes towards Catalysis
Exploration of an unusual mode of complexation of platinum(II) ion in naphtho-fused bipyrrole derived prophycene
Not Applicable

A NOVEL PORPHYRIN-BODIPY CONJUGATE WITH PANCHROMATIC ABSORPTION FOR DSSC

Polyaromatic e hydrocarbons/heterocycles embedded porphyrinoids
Synthesis and Photophysical studies of Donor–Acceptor-Type Near-Infrared (NIR) Absorbing Bis(4'-tert-butylbiphenyl-4

Phenothiazine tethered porphyrin analogous as a hole transporting materials for printable perovskite solar cells

3,6,13,16-TETRAPROPYLPORPHYCENE: POSITIONAL EFFECT OF PROPYL GROUP TOWARDS DESIGN AND C

Participation

Synthesis of naphtho-fused oligopyrrolic helicate

NO

Palladium(II)-catalyzed synthesis of indenones through the cyclization of benzenecarbaldehydes with internal alkynes

Sterically hindered meta-benziporphodimethene molecules as a cell imaging tool

Design, Synthesis and Characterization of Molecular Components for Light Induced Molecular Machines
No

Molecular material

Crystal, Spectral studies and Hirshfeld surface analysis of 3-tert-butyl-7-[(E)-2-(3,4-dichlorophenyl)ethenyl]-4H-[1,3,4]thi

Gold—ccatalyzed Synthesis of N—Heterocyclic molecules Through a Tandem Intramolecular Hydroamination/Cyclizati

No

Recent advances in bis and tetra pyrrolic molecular materials

No

Women impowerment
Axially ligated A3B-Type Complexes of Chromium(III)Chloride with oxygen donors and its Graphene Oxide Nanocompo

Survival in the Pandemic

Yea

No

synthetic organic chemistry

Ni

Corona and its preventions

Virtual Conference on

Recent Advances in *bis* and *tetra*-Pyrrolic Molecular Materials

Organized by

Department of Chemistry, SPS, Central University of Kerala

24-26th AUGUST, 2020

CONFERENCE PROCEEDINGS

SPEAKERS

Dr. M. Ravikanth
Professor
IIT-Bombay, Mumbai

Dr. L. Giribabu
Senior Principal Scientist
CSIR-IICT, Hyderabad

Dr. Pradeepta K. Panda
Professor
University of Hyderabad

Dr. Iti Gupta
Associate Professor
IIT-Gandhinagar

Dr. M. Sankar
Associate Professor
IIT-Roorkee

Dr. Raghu Chitta
Assistant Professor
NIT-Warangal

Dr. Gokulnath Sabapathi
Assistant Professor
IISER-Trivandrum

Dr. S. Prasanthkumar
Assistant Professor
DST-Inspire Faculty
CSIR-IICT, Hyderabad

Dr. Masatoshi Ishida
Assistant Professor
Kyushu University , JAPAN

Dr. Prashanth P.
Assistant Professor
Uni. of Minnesota, USA

Convener
Dr. Ravi Kumar Kanaparthi
Assistant Professor
Central University of Kerala
Kasaragod

Student Volunteers
Akhila M.
Manjeev Singh
Akshaya E.
MSc Students

Contact Details:
rkchem@cukerala.ac.in
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+917012921037
Land: 04672309149

e-Certificate to ALL the registered and attended participants

CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF CHMEISTRY

Virtual Conference
on
Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials
24-26th, August 2020

Good Practices to Attend Virtual Conference

1. Please ensure that your Mobile/laptop/desktop fully charged before attending a conference session. Login the conference room at least 10 minutes before and wait for further proceedings. LOGIN only with official registered email and don't use any other email. This is a crucial parameter to track your attendance. If you want to change your email, write to us well in advance. Always, MUTE your audio and video.
2. Conference Technical sessions links will be send to both, your email registered with us and WhatsApp group account. There is no other way that we can communicate the conference links. We have already send Links to join in the Conference Google Group and WhatsApp group. If you have any issue to join, contact us by sending a message dcrac2015@gmail.com, rkchem@cukerala.ac.in. DON'T call at any cost as I would be busy in hosting the session, I won't be able to take your call. Moreover, I would be using mobile as HotSpot to host the conference.
3. Avoid writing Greeting Messages like 'Good Morning' and 'Good Evening' in the chat box. Chat box is only meant for asking questions. If everyone start sending greeting message, we afraid the right questions will be buried. If you really want share your thoughts on the conference please don't hesitate to write to us. If you want appreciate speaker, please write to them directly.
4. As we are hosting on GoogleMeet platform, we can accommodate maximum 250 number at a time. If you can't login it could be due to this maximum limitation. Don't worry, go to our LIVE STREAM link for lectures. You may pose questions there in the chat box and our moderators will pick up questions and they ask on behalf of you to the speaker.
5. Attendance form will be posted at any time during the session and it will be enabled for 10 minutes. Those who are attending through LIVE STREAM link have to login using Gmail Account with which you registered to the conference and we have a mechanism to track the participant who is watching.
6. Your registration in the conference does not guarantee issuing a 'Participation Certificate. Participation Certificates would be issued only to those who attend all the sessions.
7. We totally understand your Internet Connectivity issues. DON'T worry, those who have technical issues, should watch YouTube Channel videos on the same day at any time.
8. 'Active Participant Award' would be announced every day to those who present all the sessions in a day and asking relevant questions to the speakers.
9. 'Overall Active Participant Award' would be announced on the last day (if not next day) based on the ATTANDNACE and ACTIVELY ASKING RELAVENT QUESTIONS to the speakers.

(Dr. Ravi Kumar Kanaparthi)
Convener

General Instructions for Oral Presentations of the Research Students

1. Since it is a virtual conference, you are advised to make power point presentation of your work.
2. Schedule of oral presentations will be shared separately. All the students presenting one session must be ready in all respects. In case last minute internet failures, the very next person in the order would be called for presenting.
3. Please ensure that your laptop/desktop fully charged before presentation and well connected with high-bandwidth internet. Always better to keep a backup device with you.
4. Send a copy of your presentation to my email (rkchem@cukerala.ac.in) before starting the oral presentation session/break time. It will be used only when there is an issue from your side to open *.ppt* file during the session.
5. Log in to the session at least 10 minutes before and wait. Sit in a clam place while presenting your work.
6. First slide should be an introductory slide which should have a **title of the talk**, **your name**, **supervisor name**, LOGO, Department/School and institution address etc.
7. No limitation on the number of slides, however, avoid large number of slides while making presentation.
8. ***Oral presentation must be finished within 8 minutes. In case of few presentations, the time only 5 minutes. Check Schedule. It is highly recommended to practice several times so that your presentation finishes within the time limit in the conference.***
9. It is good habit to introduce yourself briefly to the participants while giving presentations.
10. Don't waste your time in discussing literature and introduction.
11. It is recommended to spend more time on experimental section, results and discussion, and conclusion part.
12. Prepare for giving answers to the audience and judges questions.
13. Best few presentations will be given citation/certificate only. As you can notice, this conference is a ZERO budget conference. NO CASH award.
14. ***The oral presentation would be assessed based on organization of slides, presentation of the work, content of work, answering questions etc. and will be up to the discretion of judges. The decision of Judges will be final. Results will be announced in the concluding session itself.***

Dr. Ravi Kumar Kanaparthi
Convener

CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF CHMEISTRY

Virtual Conference
on

Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials

24-26th, August 2020

Programme Schedule

Monday, 24th August 2020 (Day – 1)	
10:00-10:45	**Inauguration of the Virtual Conference**
Technical Session – 1 Moderator: **Prof. A. Sakthivel, (Central University of Kerala)**	
11:30 – 12:10	**IL – 1: Prof. M. Ravikanth, (IIT- Bombay)** "Benzi- & Polyaromatic Heterocycles/Hydrocarbons Embedded Porphyrinoids"
12:15 – 14:00 Lunch Break	
Technical Session – 2 Moderators: **Prof. MR. Prathapachandra Kurup, (Central University of Kerala)** **Dr. Bini George, (Central University of Kerala)**	
14:00 – 14:40	**IL– 2: Dr. Masatoshi Ishida (Kyushu University, JAPAN)** N-Confused Hexaphyrins Serve as Potential Second Near-Infrared Chromophores
14:45 – 15:25	**IL– 3: Dr. Iti Gupta, (IIT-Gandhinagar)** Thioglycosylated porphyrins: Potential theranostic agents for cancer
15:30 – 17:00 Tea Break	
Technical Session – 3 Moderators: **Dr. M. Bhagiyalakshmi (Central University of Kerala)** **Dr. Raghu Chitta (NIT-Warangal)** **Dr. Gokulnath Sabapathi, (IISER-Thiruvanathapuram)** Flash Presentations by Research Scholars and Post-Doctoral Fellows	
17:00 – 18:00	
FL1	**M. B. Mrinalini: (CSIR- IICT, Hyderabad)** Conducting Nanowires: Synthesis, Self-assemly and Electronic Properties of Porphyrin Based Donor-Acceptor systems
FL2	**Sachin Kumar (Delhi Technological University)** Sterically hindered meta-benziporphodimethene molecules as a cell imaging tool
FL3	**Sameeta Sahoo (University of Hyderabad)** Exploration of an unusual mode of complexation of platinum(II) ion in naptho-fused bipyrrole derived prophycene
FL4	**Jibin Alex Abraham (Kyushu University, JAPAN)** Synthesis and Characterization of n-fused porphyrin iridium complexes towards catalysis
FL5	**Suneel Gangada (Central University of Rajashthan)** Synthesis and Photophysical studies of Donor–Acceptor-Type Near-Infrared (NIR) Absorbing Bis(4′-tert-butylbiphenyl-4-yl)aniline – Aza-borondipyrromethene (Aza-BODIPY) Dyes
FL6	**Anu (IIT-Gandhinagar)** Pd(II) porphyrins for Singlet Oxygen Generation and Photocatalysis
FL7	**K. Anjali (Central University of Kerala)** Rhodium-porphyrins complexes: preparation, heterogenization & its catalytic application for hydrogenation of biomass model compound
FL8	**Jyotsna Bania (University of Hyderabad)** A Novel porphyrin-bodipy conjugate with panchromatic absorption for DSSC

Tuesday, 25th August 2020 (Day – 2)	
Technical Session – 4 Moderators: **Dr. P. Raghavaiah,** Central University of Karnataka **Dr. Deepa Janardanan,** Central University of Kerala	
10:30 – 11:10	**IL – 4: Dr. L. Giribabu, (CSIR-IICT Hyderabad)** "Porphyrin Based Dyes for Dye-Sensitized Solar Cells"
11:15 – 11:55	**IL – 5: Dr. Gokulnath Sabapathi, (IISER-Thiruvananthapuram)** Synthesis, electronic and sensing properties of Carbazole-embedded porphyrin-like structures and di-m-phenylene incorporated expanded porphynoids
12:00 – 13:30 Lunch Break	
Technical Session – 5 Moderator: **Dr. M. Shivaprasad, (Central University of Tamil Nadu)**	
13:30 – 14:10	**IL– 6: Dr. Raghu Chitta, (NIT-Warangal)** Light Induced Energy and Electron Transfer Events in Borondipyrromethene Based Donor-Acceptor Systems
Technical Session – 6 Moderators: **Prof. A. Sakthivel, (Central University of Kerala)** **Dr. Raghu Chitta, (NIT-Warangal)** **Dr. Gokulnath Sabapathi, (IISER –Thiruvananthapuram)** Flash Presentations by Research Scholars and Post-Doctoral Fellows	
14:15 – 15:45	
FL-9	**Jaydeepsinh Chavda (III-Gandhinagar)** NIR BODIPYs: Synthesis and Biological Studies
FL-10	**Koteshwar Devulapally (CSIR-IICT, Hyderabad)** Imidazole substituted Porphyrin Sensitizers for Dye-Sensitized Solar Cell Applications: Effect of p-methoxyphenyl group
FL-11	**S.S. Sreejith (IISER-Kolkata)** DFT Study on The Mechanism of The Electrochemical Reduction of CO_2 to Ethanol Catalyzed By Cobalt Corrole.
FL-12	**Deepali Ahluwalia Delhi (Technological University)** Effect of substitution on Geometry and Intramolecular Hydrogen-Bond Strength on meta-benziporphodimethenes: a new porphyrin analogue
FL-13	**Sipra Sucharita Sahoo (University of Hyderabad)** Synthesis of naptho-fused oligopyrrolic helicates
FL-14	**Ruth Mariam Ipe, (IISER-Thiruvananthapuram)** Towards Doubly Fused Pyrene Diporphyrin: Synthesis and Preliminary Characterization
FL-15	**PRACHI GUPTA (IISER-PUNE)** Two-electron Oxidation of a Twisted non-anti-aromatic 40π Expanded Isophlorin
FL-16	**Avisikta Sinha: IIT-Bombay** Dibenzothiophene/ Furan Embedded Porphyrinoids
FL-17	**J. Ajay (IISER-Thiruvananthapuram)** Protonation Induced Planarization of Core-Modified [48] Dodecaphyrin(1.0.1.0.1.0.1.0.1.0.1.0)
15:45 – 18:00 Tea Break	
Technical Session – 7 Moderator: **Dr. M. Shivaprasad, (Central University of Tamil Nadu)**	

18:00 – 18:40	**IL– 7: Dr. Prasanth K. Poddutoori (University of Minnesota Duluth, USA)** Main Group Porphyrins in Artificial Photosynthesis
18:50 - 18:50 FL-18	**Brandon J. Bayard (University of Minnesota Duluth, USA)** Design, Synthesis and Characterization of Molecular Components For Light Induced Molecular Machines

Wednesday, 26th August 2020 (Day – 3)	
Technical Session – 8 Moderators: **Dr. Ravi Kumar Kanaparthi,** Central University of Kerala **Dr. M. Bhagiyalakshmi,** Central University of Kerala	
10:30 – 11:10	**IL – 8: Prof. Pradeepta K. Panda, (University of Hyderabad)** Tuning the Porphycene Macrocycle - A Porphyrin Isomer
11:15 – 11:55	**IL – 9: Dr. M. Sankar, (IIT-Roorkee)** Synthesis and Applications of Meso/β-Functionalized Porphyrinoids
12:00 – 13:30 Lunch Break	
Technical Session – 9 Moderator: **Dr. Bini George, (Central University of Kerala)**	
14:00 – 14:40	**IL– 10: Dr. Prasanthkumar S (CSIR-IICT, Hyderabad)** Porphyrin Based Self-Assembled Nanostructures for Organic Electronics
Technical Session – 10 Moderators: **Dr. Deepa Janardanan, (Central University of Kerala)** **Dr. Raghu Chitta, (NIT Warangal)** **Dr. Gokunath Sabapathi, (IISER-Thiruvananthapuram)** Flash Presentations by Research Scholars and Post-Doctoral Fellows	
14:45 – 15:45	
FL-19	**Govind Reddy (CSIR-IICT, Hyderabad)** Phenothiazine tethered porphyrin analogous as a hole transporting material for printable perovskite solar cells
FL-20	**A. Kalaiselvan,** Synthesis, Structure and Anion Binding Studies Of N-Confused-Like Porphyrinoinds Embedded With Carbazole Subunit
FL-21	**J. Nagamaiah (University of Hyderabad)** 3,6,13,16-Tetrapropylporphycene: Positional Effect of Propyl Group Towards Design and Control of Structural and Photophysical Properties
FL-22	**Kolanu Sudhakar (University o Hyderabad)** Corroles in electrocatalytic proton reduction
FL-23	**T. Sulfikarali (IISER-Thiruvananthapuram)** Synthesis, Structure and Electronic Properties Of P-Phenylene Embedded Cyclotrimer And Cyclotetramer
FL-24	**Nithya Mohan (CUSAT-Kochi) - 5 minutes** Effect of Structural Tuning to Enchance The Nonlinear Optical Response of Salen Type Ni(Ii) Compounds.
FL-25	**Shinto Varghese (Mar Thoma Collge, Tiruvalla) - 5 minutes** Adsorption of Methylene Blue on Silica Synthesized from Different Sources
FL-26	**Gutti Pavan (University of Mumbai) - 5 minutes** COVID-19: Attacks the 1-Beta Chain of Haemoglobin and Captures the Porphyrin to Inhibit

	Human Heme Metabolism
FL27	**Mannarsamy Maruthupandi (IIT-Hyderabad) - 5 minutes** Catalytically active coordination polymer with a tiny Zn_2Se_2 ring bridged by bis-selone
15:45 – 16:30	**Tea Break**
17: 30 – 18:15	**Concluding Session & Valedictory Function**

Note:

1. All the Invited Lectures duration will be 40 minutes' followed by 5 minutes' discussion.
2. All the flash oral presentations of young researchers will be 8 minutes' duration, followed by 2 minutes discussion. In few cases it is 5 minutes only. Check programme schedule.
3. All the presenting persons are requested to comply with the time for you in order to conduct the program smoothly on time.

Welcome address in the inauguration

MAY I REQUEST ALL OF YOU TO STAND FOR 'CENTRAL UNIVERSITY OF KERALA ANTHEM'

The most respected, Hon'ble Vice Chancellor, Prof. H. Venkateshwarlu; Professor Prathapachandra Kurup, the Dean of School of Physical Sciences & Director of Research, CUK; Head of the Department, Prof. Sakthivel; our distinguished resource persons of the conference representing prestigious Institutions and Universities of India, Japan and USA, participants of the conference, non-teaching staff, my department colleagues: Dr. Bini, Dr. Deepa and Dr. Bhagiyalakshmi, other faculty members of CU Kerala and my dear students,

a warm good morning to one and all, on behalf of the organizing committee, I extend my heartfelt welcome to the three-day Virtual Conference on **Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials**.

We are extremely happy for materializing this virtual conference for two obvious reasons: This is the first full-pledged thematic conference that our Vice Chancellor is inaugurating after he assumes the charge in Central University of Kerala. The second reason is that despite of the hardship that we all facing, we could able to get the top-class researchers: Prof. Ravikanth, Dr. Giribabu, Prof. PK Panda, Dr. Iti, Dr. Sankar, Dr. Raghu, Dr. Gokul, Dr. Prasanth, Dr. Mastoshi Ishida and Dr. Prasanthkumar as resource persons to the virtual conference.

We are organizing this thematic conference with two primary objectives:

We want to expose masters' students to latest developments in specific research areas along with fundaments in chemistry. As you all aware: Every day, we are encountering many webinars and lecture series organized various institutions, universities and societies etc. However, as far as chemistry is concerned, we hardly

find a research specific conference in plethora of conferences. So, we decided to organize one conference and create one platform not only to the faculty memebrs, but also for the young researchers and aspirants under the umbrella of Department of Chemistry, Central University of Kerala. Believe me this conference, is not less than any physical conference.

Coming to the conference theme,

The conference title appears very technical and specific but the truth is, this is known to everyone at least all of us.

1. We were taught about 'Natural Photosynthesis' process in our schools: Green leaves makes carbohydrate naturally. We were also taught, chrophyll present in green leaves absorbs sunlight and converts CO_2 to carbohydrate using water. The chrophyll contains a 'porphyrin moiety' a cyclic molecule that four pyrrole moieties that are bridged by methine groups. So, the word 'tetra-pyrrolic' in title of the conference refers to porphyrins, and of course there are few more in this category.
2. Another, importance of porphyrins is 'oxygen capturing' from the air that we breath. As you know, our blood consists of Red Blood Cells and contains haemoglobin (Hb) which contains four porphyrin molecules and play an important role in capturing oxygen from other gases like nitrogen, CO_2, CO and so one transportation.
3. Porphyrins are used as theranostic agents in clinical applications; one best example is photodyanamic therapy (PDT). Photodynamic therapy (PDT) is a clinical established as minimally invasive method to treat cancers and other diseases. It involves three elements: a photosensitizer, light and oxygen. In this therapy, porphyrin and porphyrin-related compounds are the most commonly used photosensitizers. After administration and delivery of a photosensitizer to a tumor site and upon light irradiation, it will generate reactive singlet oxygen ($^1O_2$), leading to cell death and tumor destruction.
4. In the recent past few years, there are several Bis and Tetra-Pyrrolic molecular systems have been developed to harvest solar energy to convert into electricity, and

these devices are called DSSCs. These devices having huge potential to harvest ambient light along with the sunlight.

5. Further these molecular systems, especially bis-pyrrolic BODIPY molecules were shown to have great importance in detecting certain elements like hypochlorite, cyanides, hazardous gases and so on.
6. These molecular systems form very interesting nanostructures which were exploited in OLED applications.

So, overall I would say that, the theme of the conference is very important not only to the researchers but also for many common people.

About the Virtual Conference:

The conference stretched over three days and comprises of 10 technical sessions. Out of the 10 sessions, 3 sessions are dedicated exclusively to the oral presentations of young PhD students and Post-Doctoral Students. I must tell you, we have received a huge response from the young research scholars and we have rejected 12 oral presentation requests mainly because of the tight schedule and accommodated only 27 oral presentations. As I mentioned previously, the conference theme is very specific, about 12 research groups are actively working in this area in India out of which we have received 40 presentations, this shows we have partially achieved the target what we wanted to achieve by organizing the virtual conference.

416 participants: 1. MSc students-165; 2. PhD and Post-Doctoral Students-100 Faculty Members-62; and BSc students and intermediate students-89 students.

In order to provide equal opportunities all the participants located in different parts of the country and abroad, we are going to LIVE stream all the conference proceedings and we will also upload all the video lectures in our YouTube Channel. Therefore, those who face sudden internet failures and poor connectivity issues can perhaps go through the lectures at night times. Please note that it is only an option

and attendance in all the technical sessions is mandatory for getting valid certificates.

We are introducing **few citation awards** to bring liveness to the conference. Every day we will announce, 'Active Participant Award' those who attend all the sessions and interact with resource persons during the technical sessions. Similarly, we have Overall 'Active Participant Award'. For young researchers who are going to present their work, we are introducing 'Best Oral Presentation Award'.

Well at outset, we are extremely happy for bringing all these eminent active researchers and many participants to this conference. We have no doubt that this conference is going to be opportunity to learn all basics of bis and tetra pyrrolic molecules which will be useful to all the all student participants. We believe that the deliberations of the conference would lead to productive quality research papers and secondary research papers like writing book chapters and books. We wish, this conference will make bonds not just a BOND which is very strong that may lead to collaborative research among the participants of this conference.

Convener

(Dr. Ravi Kumar Kanaparthi)

Inauguration of Virtual Conference
on
Recent Advances in Bis and Tetra-Pyrrolic Molecular Materials
Date & Time : 24-26th August, 2020 (10:00 – 10.45 am)

University Anthem

Welcome Address
Dr. Ravi Kumar Kanaparthi
(Assistant Professor & Convener of the Virtual Conference)

Felicitation
Prof. (Dr.) A. Sakthivel
(Head, Department of Chemistry)

Presidential Address
Prof. (Dr.) MR Prathapachandra Kurup
(Dean, School of Physical Sciences & Director of Director of Research, CUK)

Inauguration

Prof. (Dr.) H. Venkateshwarlu
Hon'ble Vice Chancellor, Central University of Kerala

Vote of Thanks

Dr. M. Bhagiyalakshmi
(Assistant Professor, Department of Chemistry)

INAUGURATION

Prof. (Dr.) H. Venkateshwarlu

Hon'ble Vice Chancellor, CU Kerala

Education: M.Com., M.Phill., Ph. D. from Osmania University.

Career: Joined as lecturer in University College of Commerce and Business Management, OU and elevated to Professor at very young age, 1994.

Research: 36 years Teaching and Research Experience
30 research articles, 10 books on business communication, marketing management, emerging trends in the banking sector and supply chain management.

Research Guidance: 25 PhDs and 5 M.Phill. and 6 PhDs under progress.

Administrative Experience: Head, Dean, Principal and Chairman of UCC&BM, OU; Director of PGRR Centre for Distance Education; Dean of the College Development Council; Coordinator of DRS-I & II of UGC-SAP (2004-2014). Visited many prestigious Universities like, Stanford University, Wharton Business School, Princeton University and San Diego University etc.

Special Officer of Centenary Celebrations of OU

Recognition: Best Teacher Awardee – 2010, Govt. of Andhra Pradesh Member, Peace Committee for OU, Govt. of A.P. ICSSR, Teacher Fellow, IPE, Hyderabad Member, National Commission – e-Content writing Ministry of HRD, New Delhi.

PRERANA Programme of TSCHE is the BrainChild of Prof. Venkateshwarlu, developed as the leader of TCA.

Prof. (Dr.) MR Prathapachandra Kurup
Dean of SPS & DoR, CU Kerala

Education: M.Sc, Ph.D. from University of Delhi 1989

Career: Started his career as a Jr.Lecturer at N. S. S. College, Manjeri in 1979.Served as a Lecturer at N. S. S. H. College, Changanacherry.joined the Department of Applied Chemistry, Cochin University of Science and Technology, Kochi as Lecturer in 1992 and was promoted to Reader in the same year.elevated to Professor in the year of 2000.

Areas of interest:Coordination Chemistry of transition metal complexes of multidentate ligands,EPR Spectroscopy, Single crystal X-ray diffraction studies,Crystal engineering

Research:He has 37 years of teaching and 33 years of research experience. 346 publications,Undertaken various research projects for DST,CSIR,UGC,DRDO,KSCSTE.

Research Guidance:36 Ph.D students,Received one time grant from UGC in 2011 for producing more than 15 PhD students.

Administrative Experience:SAP (UGC) Coordinator,Director, Inter-University Center for Nanomaterials and devices Coordinator, DST PAC, Member, Board of Studies in Chemical Oceanography,CUSAT. Member, Board of Studies in Chemistry, The Gandhigram Rural Institute,Member, Board of Studies in Applied Chemistry,CUSAT,Syndicate member in CUK and CUSAT,Academic council member in CUK and CUSAT

Membership of professional societies: Life member, National Magnetic Resonance Society (NMRS) Bangalore, India,Member of Asia Pacific EPR/ESR society,Life member in Society for Biotechnologists (India), Life member in Chemical Research Society of India (CRSI).

Prof. (Dr.) A. Sakthivel, FRSC

Head, Department of Chemistry, CU Kerala

Education: M.Sc, Ph.D. from IIT Bombay in 2002

Career: Postdoctoral Fellow at Taiwan,AvH-Germany, Max-Planck-Germany, JSPS Japan, worked as a Senior Manager in RELIANCE INDUSTRIES LIMITED (Vadodara Manufacturing Division), Joined as Assistant Professor: DELHI UNIVERSITY in 2010.Became Associate professor in 2016 an elevated as Professor in 2020.

Spealicatision and Core Area of Expertise: Materials Chemistry (Preparation and characterization of Novel nano-porous and nano-materials),Development of eco-friendly heterogeneous catalysts for fine & petrochemical processes.Nanoparticles synthesis and its catalytic application for hydrogenation / hydroformylation Heterogenization of homogeneous catalysts

Research:17 years of research experience,Published 101 research articles, 1 academic teaching book,4 book chapters,received 4 patents

Research Guidance:5 PhD and 1 M.Tech scholar,5 Phd students are under progress.

Administrative Experience:Selection Committee member, MEXT Research Scholarship 2019, JAPAN, Chairman, Board of Studies, Department of Chemistry CUK, Editorial Advisory Board Membership-Recent Patents on Materials Science, Bentham science, Academic Council member, Deputy-coordinator for Centralized evaluation of M.Sc. & M.Tech.

Recognition:Fellow of Royal Society of Chemistry, Royal Society of Chemistry, Mayadevi Juneja Endowment Medal Award, Dr. Sistla Kameswari Young Scientist Award, Young Researcher Award,

INVITED SPEAKERS

Prof. (Dr.) M. Ravikanth FASc, FNASc, FNA

IIT-Bombay, Mumbai

Education: M.Sc, Ph.D. from Indian Institute of Technology, Kanpur in 1994.

Career: Visiting postdoctoral fellow at Tata Institute of Fundamental Research, Bombay(1994). Worked as a Postdoctoral fellow at Carnegie-Mellon University, Pittsburgh for 2 years and also at North Carolina State University, Raleigh, NC, USA (1996), Japanese Society for the Promotion of Science postdoctoral fellow at Kyoto University, Kyoto,Japan(19998-1999). Joined as Assistant Professor at, Indian Institute of Technology, Bombay in 1999 and elevated to Associate Professor in 2003.Currently working as a Professor,Indian Institute of Technology, Bombay as a Professor.

Research: Interested in Synthesis and photodynamics of unsymmetrical multiporphyrin arrays, Synthesis and characterization of porphyrins attached to organometallic systems, Design and synthesis of porphyrin systems to study nonlinear optical properties,Use of porphyrin systems as catalyst in organic conversions and their potential as drugs in photodynamic therapy of cancer,Supramolecular Chemistry, Light harvesting arrays, Self assembling systems, Synthesis of cation and anion sensors based on porphyrin systems.

269 publications in various Journals, Currently 3 projects are undergoing under his guidance

Research Guidance: 25 PhD, 13 PhD are under Progress

Recognition:JSPS fellowship 1998, AvH Fellowship (2005), CRSI Bronze medal (2012), IRCC Best Research Paper Award (2014), Fellow of Academy of Sciences, Bangalore (FASC, 2015), Institute Chair Professor (2017-2020), S.C. Bhattacharya Award for Excellence in Science (2019), Fellow of National Academy of Sciences, Allahabad (FNASc, 2019)

Dr. L. Giribabu

Senior Principal Scientist; CSIR-IICT, Hyderabad

Education:M.Sc,M.Phill,Ph.D from University of Hyderabad in 1999

Career:Post-Doc fellow at Central Queensland University(2000) and also at University of Houston(2001). Joined at CSIR-Indian Institute of Chemical Technology Hyderabad as a QRS in 2003 and promoted as a Scientist in 2006. elevated to Senior Scientist in 2009)and became Principal Scientist in 2013.Currently working as a Senior Principal Scientist at IICT.

Areas of interest:Dye-Sensitized Solar Cells-His group actively involving in development of low-cost
and efficient materials for dye-sensitized solar cells. Mainly for the development of sensitizers, redox electrolytes, and electrode materials.

Research: 25 years of research experience,100 Publications,sevenn projects has been completed,received 7 patents.His group developed stable Ru(II) complex by modified bipyridyl ligand (HRD-1) and device efficiency has shown >10% using liquid redox couple.

Recognition: Fellow Andhra Pradesh Academy of Sciences, Andhra Pradesh Academy of Sciences,2019,Fellow Telangana Academy of Science, Telangana Academy of Science, 2018,National Coordinator CSIR, 2011,Fellow Luminescence Society of India, Luminescence Society of India, 2017

Prof. Pradeepta K. Panda

University of Hyderabad

Education: B.Sc. degree in Chemistry from Utkal University (Odisha)in 1990.
MSc.: Indian Institute of Technology Kanpur (India).
PhD.: Indian Institute of Sciences, Bangalore (India) from 1994 to 2002.
Career:
Post-doctoral Fellow : Kangwon National University, Chun Cheonhe, South Korea (2002-2005).
Mentor: Professor Chang-Hee Lee
VBL Postdoctoral Fellow with Professor Jun-ichiro Setsune at the Kobe University, Kobe and subsequently as a JSPS Fellow (2005-2006)
Assistant Professor: School of Chemistry, University of Hyderabad in 2007, elevated to Associate Professor in 2012, where he is currently a full Professor (2015).

Research Interests: His research interests involves around fundamental and functional aspects of porphyrinoid chemistry.

Publications: He has authored more than 40 independent research publications.
PhD guidance: Ph. D. students -9
Awards: He is a fellow of the Telengana Academy of Sciences (2019).

Dr. Iti. Gupta

IIT-Gandhinagar

Education: M.Sc, Ph.D from IIT Bombay in 2005

Career: Postdoctoral Fellow at Kyushu University, Fukuoka, Japan (2005).

Served as a Lecturer at Birla Institute of Technology and Science-Pilani Goa(2007).

Joined at Indian Institute of Technology, Gandhinagar as an Assistant Professor in 2009 elevated to Associate professor in the year of 2015

Research:Boron based NIR dyes and their conjugates, Derivatives of corroles and N-confused porphyrins with novel properties, Metal complexes of dipyrrins

Dr. M. Sankar

IIT-Roorkee, India

Education:M.Sc,Ph.D from Indian Institute of Technology Madras in 2005

Career:Research Associate at Tel-Aviv Univ., Tel-Aviv, Israel(2005).Served as a Postdoctoral Fellow at Univ. of Bourgogne, Dijon, Franc(2007) and as a CNRS Postdoctoral Fellow at Univ. of Rennes1, Rennes, France(2008).JSPS Fellow at Univ. of Tsukuba, Tsukuba, Japan(2009).Joined as an Assistant Professor IIT Roorkee on (2011).elevated to Associate professor in the year of 2015.

Research: Synthesis and Studies on Porphyrinoids, Coordination Chemistry, Supramolecular Assemblies, Catalysis, Photophysical & Photovoltaics Studies.

More than 37 publications

Recognition:Fellow of the Royal Society of Chemistry (FRSC) RSC, Cambridge, UK (2020),Outstanding Young Faculty Award with Institute Research Fellowship (IRF),Received JSPS Fellowship,CNRS Fellowship,EDIGE Fellowship,BASE Fellowship,visited many prestigious Universities like Univ. of North Texas and Univ. of Houston,USA

Membership:American Chemical Society (ACS), Member,Royal Society of Chemistry (RSC), Member,Chemical Research Society of India (CRSI), Life Member.Electrochemical Society (ECS), Member,Society of Porphyrins and Phthalocyanines (SPP), Member

Dr. Raghu Chitta

NIT- Warangal, India

Education:M.Sc, Ph.D in Organic and Analytical Chemistry from Wichita State University, Wichita, KS, U.S.A. in 2007.

Career:Served as a Postdoctoral Associate At University of Minnesota, Twin Cities, MN, USA.(2007-2011) and at University of Houston, Houston, Texas, USA(2011).Joined at Central University of Rajasthan as an Assistant Professor in 2011. Currently working as Assistant Professor at National Institute of Technology Warangal.

Areas of interest:Synthesis and Study of Organic and Organometallic Light Harvesting Compounds for Artificial Photosynthetic Systems, Dye Sensitized and Organic Solar Cells, Photo-driven Water Splitting, and Fluorescent Chemosensors

Research: 39 publications in different journals

Research Guidance: 1 PhD, Two Phd Submitted,Two PhD are under progress.

Recognition:Parker fellowship Recipient,First prize in poster session at Wichita state University at 2006,Outstanding Graduate Teaching Assistant Award from Wichita,KS,US for Advanced Analytical Lab,Best poster at The Capitol Graduate Research Summit in 2007,Dora Wallace Hodgson Outstanding Doctoral Dissertation Award at Wichita,KS,United states,Gold medal for Oral Presentation in Calicut,German Academic Exchange Service(DAAD) Fellowship

Dr. Gokulnath Sabapathi

IISER- Tirupati, India

Education:M.Sc,Ph.D from Indian Institute of Technology Kanpur in 2008

Career:Post-Doc Fellow - Kyushu University, Japan 2009,Joined as an Research Assistant Professor at Kyushu University, Japan (2011),Served as an Research Associate at National University of Singapore (2012),DST-Inspire Faculty at CSIR-IICT, Hyderabad (2013), Currently working as an Assistant Professor at IISER Trivandrum, since August 2015

Research:Macrocyclic systems, Bioinorganic Chemistry,Planar Aromatic and Antiaromatic systems, Porphyrin based Dye-Sensitized Solar cells (DSSC)

Recognition:SERB Young Scientist Grant (2016),DST Inspire Faculty Fellowship (2013),NUS Research Fellowship (2012).Global COE Post-Doctoral Fellow (2009)

Dr. Masatoshi Ishida

Kyushu University, JAPAN

Education:M.Sc,Ph.D from Kyushu University in 2010.

Career:Postdoctoral fellow at Institute for Material Chemistry and Engineering, Kyushu University, Japan_2010),WCU Postdoctoral Fellow Yonsei University, South Korea(2011),

Joined as an Assistant Professor at Education Center for Global Leaders in Molecular System for Devices, Kyushu University, Japan(2013).

Currently working as an Associate Professor at Department of Chemistry and Biochemistry, Graduate School of Engineering, and Center for Molecular Systems, Kyushu University, Japan from 2015 onwards.

Recognition: The Maruyama Memorial Research Award,Young Scholar Lectures, The Chemical Society of Japan, Excellent Paper Award, The Society of Synthetic Organic Chemistry, Kyushu Branch, Japan

Dr. Prasanth Poddutoori

University of Minnesota Duluth, USA

Ph.D.: Bioinorganic Chemistry, School of Chemistry, University of Hyderabad, Hyderabad, India, 2005.
Thesis: Donor-acceptor systems based on axially and peripherally substituted porphyrin building blocks.
Advisor: Late Prof. Bhaskar G. Maiya.

Postdoctoral Fellow: Brock University, Canada, 2005-2010

Instructor: Trent University, Canada, 2011

Research Scientist: Vertichem Corporation, Cambridge, Canada, 2012

Assistant Professor: University of Prince Edward Island, Canada 2013-2017
Assistant Professor: University of Minnesota Duluth, USA, 2018-to-date.

Research Interests: Main Group Porphyrin Chemistry, ~~Molecu~~lar Electronics

Dr. Prasanthkumar S

CSIR-IICT, Hyderabad

Education:M.Sc,Ph.D from National Institute for Interdisciplinary Science and Technology, NIIST (formerly RRL), Trivandrum, India and Ph. D registered to University of Kerala, Kerala,India in 2012.

Career: Served as a Post Doctoral Associate in the group of Prof. Takuzo Aida, Centre for Emergent Matter Science, Emergent Soft Matter Function Research Group, RIKEN, Japan (2012-2015). Currently working as a DST-Inspire faculty at P & FM Division, CSIR-IICT, Hyderabad, India.

Research:In functional molecular self-assemblies of linear π-conjugated systems using non-covalent interactions.

Published several research papers in international reputed journals- such as JACS, Angew Chem and some of the work highlighted in Nature Nanotechnology and Nature India.

Recognition:Associate Fellow of Telangana Academy of Sciences (2020),DST-Inspire faculty award (2015),RIKEN research fellowship (2012),Selected for Indo-Japan exchange postdoc fellow under JENESYS program,IMS, Japan (2011)

CHAIRPERSONS/MODERATORS

Dr. M. Bhagiyalakshmi

Assistant Professor, Central University of Kerala

Education: M.Sc,Ph.D from Anna University in 2007

Career:served as a Senior Chemist, R&D in Thirumalai Chemicals Ltd.,Ranipet, Tamilnadu, Joined as a Lecturer at M.N.M Jain Engg. College Chennai,Continued research in Hanseo University South Korea for about 3 years, Worked as Teaching fellow in University College of Engineering, Anna University and as Assistant professor (contractual) in Central University of Tamil Nadu.Also worked at VIT as Assistant Professor (Senior Grade) for seven months.

Specialization:Catalysis, CO2 chemistry, Porous materials, MOF, ZIF, Carbon Materials,Organometallic catalyst, Biomimetic catalyst, Biomaterials, Nanomaterials, Enzymatic reaction, Immobilization, Chemical and Enzymatic Kinetics. Mineralization, Carbon Capture by Solid and Alkanolamine Sorbents. sequestration of CO2 as CaCO3 Polymorphs. Electrochemistry for CO2 Reduction, Energy Storage and Fuel Cell Applications. Green Chemistry.

Research:Published 24-national/international research articles in peer-reviewed journals and presented her research findings in various national and international conferences.

Research Guidance:

Recognition:Best Poster Presentation –Spring symposium –South Korea-2019,University 3rd Rank in M.Sc. Applied Chemistry,Proficiency First in Chemistry Main in B.Sc. Chemistry 1996

Dr. Bini George

Assistant Professor, Central University of Kerala

Education M.Sc,Ph.D from Mahatma Gandhi University in 1999

Career: Gained international industry experience as Chemist, Intertek Caleb Brett (UK) Ltd, Sharjah, U.A.E and as Quality Assurance Representative, Geo-Chem Middle East, Dubai, U.A.E., Worked as Research Fellow(DST Project) at MG University, Kottayam,Served as Short-term Research Fellow at IISC and CSIR Trivandrum.Joined as a lecturer at St. Francis Institute of Technology, (Engg. College), Borivali (W), Bombay

Research Specialization: Chemistry and applications of functional polymers, molecular imprinting of polymers, Organic synthesis, Bio Polymers, Nano materials and Biofuels.

Published several research papers and presented papers in national / international conferences.

Research Guidance:

Recognition: Young Scientist Award (Physical Sciences) of the State Committee on Science, Technology & Environment, Govt. of Kerala State

Dr. Deepa Janardanan

Assistant Professor, Central University of Kerala

Education: M.Sc,Ph.D from Indian Institute of Technology Bombay in 2009

Career:Moved to the group of Dr. Sason Shaik of the Hebrew University of Jerusalem for post-doctoral research,Worked as as a guest faculty at DB Pamba College Parumala, Served as a s Teaching Assistant at IIT Bombay

Research Specialization:Organocatalysis, Transition metal catalysis, Enzyme catalysis Reaction mechanism, Stereo and regio-selectivity Spin-state effects, Organic and organometallic reactivity

17 publications in high-impact peer-reviewed journals of international status.

Research Guidance: Two students are working under her guidance.

Recognition:Won 1st Prize of Eli Lilly and Company Asia Outstanding Thesis Awards from Indian Institute of Chemistry, Bombay,Secured All India Rank 92 (96.7 percentile) in GATE-2003 conducted by the Ministry of Human Resource Development, Government of India,Secured first rank in M. Sc. (Organic Chemistry), Mahatma Gandhi University, Kottayam

Dr. Raghavaiah Pallepogu

Associate Professor, CU Karnataka

Education:M.Sc,Ph.D from Goa University in 2008
Career: Worked as a service crystallographer at DST funded National Single Crystal X-ray Diffractometer Facility, School of Chemistry, University of Hyderabad. Post-doctoral stint at Center for Supramolecular Chemistry Research, Dept. of Chemistry, University of Cape Town, South Africa, Served as Scientific Officer at the University of Hyderabad.

Assistant Professor at Dept. of Chemistry, Dr. Harisingh Gour University, Sagar, Madhya Pradesh. Currently working as Associate Professor at Dept. of Chemistry, Central University of Karnataka (CUK).

Research:Interested in chemical crystallography and solid-state beneficiation.
Published ninety (90) research articles in various high impact national and international journals,
Research Guidance: 1 PhD student and MSc projects.

Dr. M. Shivaprasad

Associate Professor, CU Karnataka

Education: M.Sc,Ph.D from Hyderabad Central University in 2013

Career: Working as Assistant Professor at Central University of Tamil Nadu from 2013 onwards

Area of Interest:: Drug analogues, Sustainable catalysis, Asymmetric Synthesis,Combined organo Transition metal complexes.

Research: 8 research article has been published in different Journals.

Currently One project is undergoing with Science and Engineering Research Board, DST India funding entitiled “Asymmetric Synthesis of Potent Antimitotic/AntiCancer Natural Product Disorazole A1 and it’s Analogs”

Recognitions:Qualified CSIF JRF-NET -2008 ,Awarded CSIR-JRF 2008-2010, Awarded CSIR-SRF 2010-2013, Qualified GATE-2008,National Overseas Scholarship for Postdoctoral Research 2016, Member of Board of Studies, Chemistry CUTN 2016-2019 ,Life Member Chemical Research Society of India ,Member of Royal ~~Society~~ of Chemistry (MRSC) 2019- till date,Member of American Chemical Society 2019- till date.

Dr. Ravi Kumar Kanaparthi

Assistant Professor, Central University of Kerala

CONVENER

CONTENTS

INVITED LECTURE (IL -1)
Polyaromatic Hydrocarbons/Heterocycles Embedded Porphyrinoids

M. Ravikanth

Department of Chemistry, Indian Institute of Technology, Bombay
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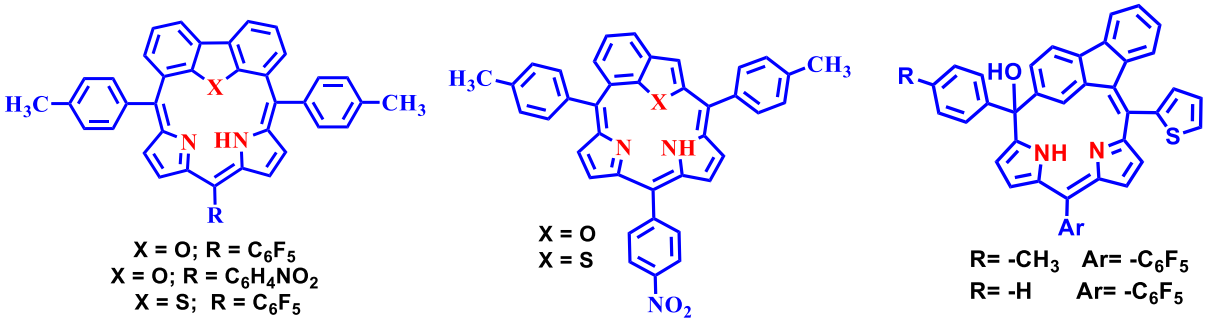
ABSTRACT

Porphyrins are pyrrole based 18π electron aromatic conjugated systems having four pyrrolic rings connected by four methine bridges. Porphyrins and metalloporphyrins present at the active site of numerous biomolecules play an important role in living systems. Porphyrins showed remarkable photophysical and electrochemical properties and have broad range of applications in the field of catalysis, dye-sensitized solar cell, molecular electronics, contrast agents for magnetic resonance imaging etc. Chemists can alter the properties of these macrocycles by introducing substituents, changing the central metal ion and, replacing one or more pyrrole rings with other heterocycle rings or polycyclic aromatic hydrocarbons/heterocycles etc. Our group is involved in synthesizing such interesting polyaromatic heterocycles/hydrocarbons embedded porphyrinoids and few examples are shown in the Chart. The synthesis, properties and coordination chemistry of novel polyaromatic heterocycles embedded porphyrinoids[1-7] will be presented in my talk.



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INVITED LECTURE (IL -2)
N-Confused Hexaphyrins Serve as Potential Second Near-Infrared Chromophores

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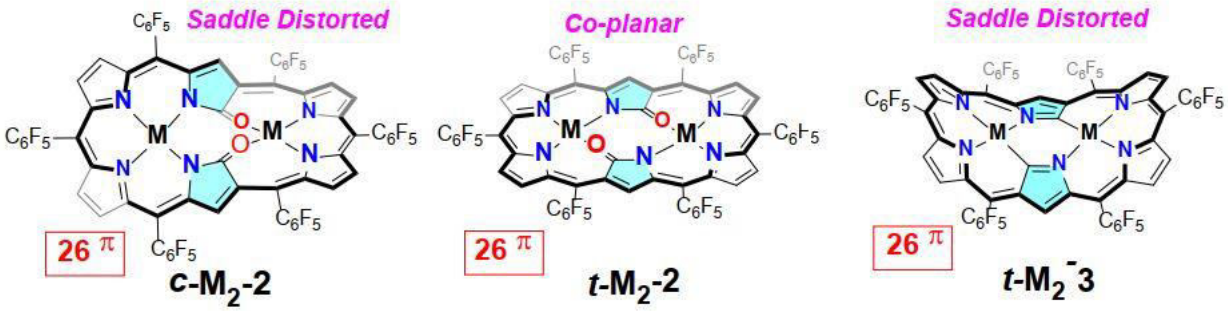
ABSTRACT

Expanded porphyrins consisting of more than five pyrrole rings have emerged as one of the essential classes of near-infrared (NIR) chromophores and offer new opportunities for optical materials to be used in the fields ranging from light-harvesting to sensing and therapeutic applications. Meso-aryl-substituted [26]hexaphyrins (**1**) are the aromatic hexapyrrolic compounds showing unique conformation-dependent optical features along with second NIR emissions, photo-thermal properties, and so on.

Here we report that the synthesis of a variety of N-confusion-modified hexaphyrin analogs (**2-3**) containing peculiar linked pyrrole rings as new NIR chromophores to be used in the potential imaging applications.[1-3] In particular, a choice of metal ion in the complexes plays an essential role in tuning their optical properties such as absorption, emission, and photoacoustic responses. The detailed structure-photophysical property relationship for the hexaphyrins will be discussed.



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INVITED LECTURE (IL -3)
Thioglycosylated porphyrins: Potential theranostic agents for cancer

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ABSTRACT

Porphyrin derivatives are used as theranostic agents in magnetic resonance imaging (MRI) and photo-dynamic therapy (PDT) of cancers [1]. The substitution of other chromophores viz. carbazole/ triphenylamine/ phenothiazine on the porphyrin skeleton can be beneficial to fine-tune the spectral properties of porphyrins [2]. The attachment of thio-hexose sugars on the *meso*-phenyl rings can yield water soluble porphyrins; such thio-glycosylated porphyrins are highly desirable for optical imaging and can be targeted towards cell receptors rich in lectins for PDT application. Our group at IIT Gandhinagar, is involved in the synthesis and biological applications of porphyrins [3], BODIPYs [4] and dipyrrinato metal-complexes [5]. In this talk, we present the synthesis, photophysical properties and PDT studies of thio-glycosylated A_2B_2 type porphyrins and their Zn(II) complexes containing electron rich bulky aromatic groups on their *meso*-positions.

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INVITED LECTURE (IL -4)
Porphyrin Based Dyes for Dye-Sensitized Solar Cells

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ABSTRACT

Dye-Sensitized Solar Cells (DSSCs) have reached certified efficiency of 11.9% and device of 14.7% but the technology is not yet commercialized completely.[1] Among various components of the device, the sensitizer plays a crucial role in achieving high efficiency and durability.[2] However, the Ru(II) polypyridyl complex based sensitizers have some technical constrains that includes tedious synthetic protocols, rarity of the metal in earth's crust, and cost effective.[3] For this reason, porphyrins are found to be bester alternative based on their optical and electronic properties. A great variety of porphyrins have been reported in literature in which an anchoring group is either at β-pyrrole or meso-phenyl position of macrocycle but their efficiency remains at around 7%. For this reason, researchers across the globe have adopted donor-π-acceptor (D-π-A) approach so that porphyrin macrycyle is far away from TiO_2 nano particles that minimizes recombination phenomena and enhances the device efficiency. In D-π-A concept, the donor is generally an organic moiety having absorption in UV region, porphyrin is a π-spacer and an electron withdrawing cyanoacrylic acid is either acceptor or anchoring group that will improve the absorption of porphyrin particularly in red region of absorption spectra. By adopting this approach our research group have designed several porphyrins and crossed device efficiency of 10%.[4,5]

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INVITED LECTURE (IL -5)

Synthesis, electronic and sensing properties of Carbazole-embedded porphyrin-like structures and di-*m*-phenylene incorporated expanded porphynoids

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ABSTRACT

The synthesis of a new class of carbazole based porphyrin-like macrocycles *via* [3+1] acid condensation along with its metal complexes will be presented. All the macrocycles shows partial aromatic character and red-shifted emission starting from 600 nm which makes them unique in comparison to other carbazole based modified porphyrins reported.[1,2] A series of spectroscopic, electrochemical measurements and a set of theoretical calculations demonstrate that the core-modification of the inner core of these macrocycles has a large influence on the electronic structure. Due to the presence of porphyrin-like cavity, the metal binding studies were investigated and observed the colorimetric changes that demonstrate that these carbazole-embedded macrocycles could be used as selective Hg2+ ion sensors.[3b]

Acid-catalyzed condensation of a newly prepared di-mbenzipentapyrrane with appropriate mono- and diheterocyclic dialcohols selectively produced stable di-*m*-benzihexaphyrins and di-*m*-benziheptaphyrins with only two *meso*-carbon bridges. Single-crystal X-ray diffraction analyses reveal planar conformation with slight distortion of bridged phenylene rings. Despite the presence of m-phenylene units interrupting the global delocalization, the presence of bithiophene units in di-mbenziheptaphyrins exhibits altered optical features covering the entire visible region (ca. 250−720 nm), exhibiting a black dye property as a “metal free” porphyrinoid”.[3c]

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INVITED LECTURE (IL -6)
Light Induced Energy and Electron Transfer Events in Borondipyrromethene Based Donor-Acceptor Systems

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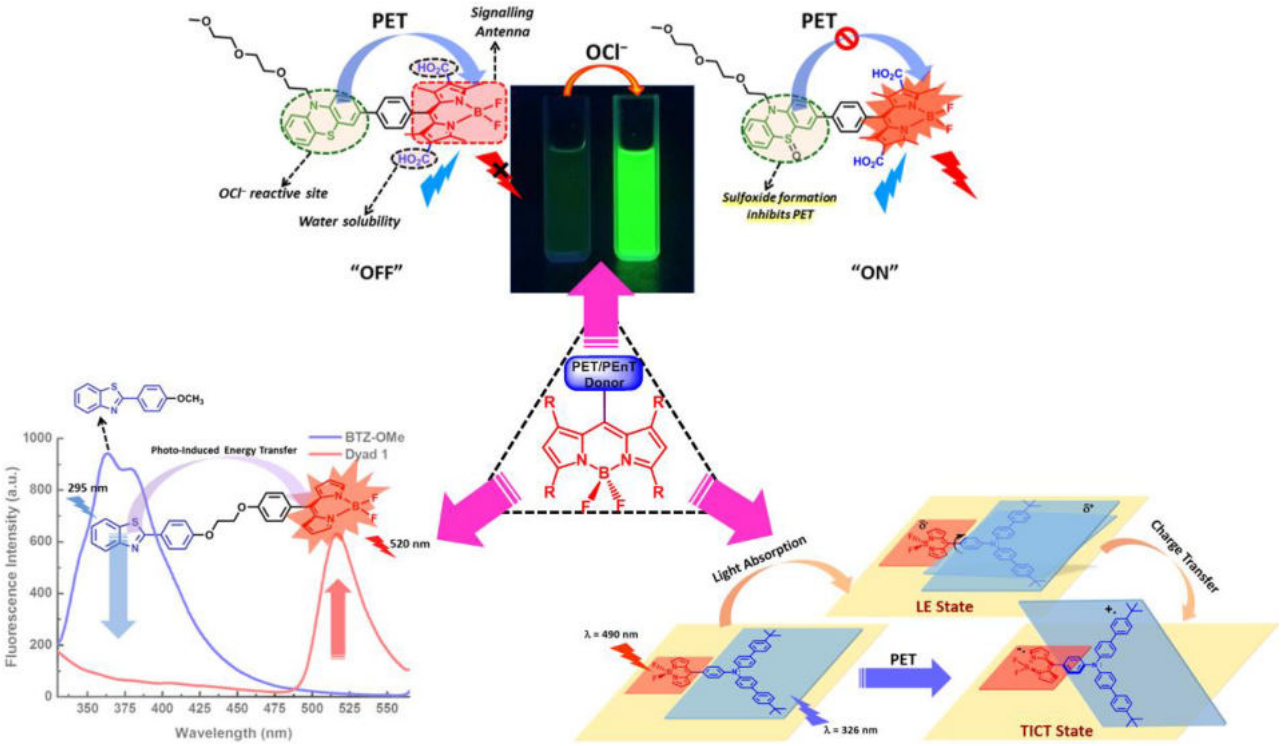
ABSTRACT

Boron dipyrromethene (also known as BODIPY) stand out as a promising molecule in light harvesting antenna and electron donors/acceptors in electron transfer cascades. BODIPYs are very peculiar functional dyes with high photo stability and fully tuneable photophysical and electrochemical properties by synthetically modifying the core of the chromophore.[1]



A variety of BODIPY based light harvesting molecules containing benzothiazole as energy donor,[2] phenothiazine[3] and *N, N*-Bis(4′-*tert*-butylbiphenyl-4-yl)aniline[4] as electron donors have been synthesized and photophysical studies elucidating the photo-induced energy (PEnT) and electron transfer (PET) have been performed. The results pertaining to their photo-and electrochemical behaviour in these systems and their use in real-time applications will be presented.

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INVITED LECTURE (IL -7)
Main Group Porphyrins in Artificial Photosynthesis

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ABSTRACT

Recently, we reported several 'axial-bonding' type multicomponent Donor-Acceptor systems using porphyrins that consists of main group elements at the center. Among these porphyrins, aluminum(III) porphyrin (AlPor) and phosphorus(V) porphyrin (PPor) are unique in terms of their structural, electronic, and redox properties. For example, both porphyrins form axial bonds, which allow us to build axially linked multicomponent Donor-Acceptor systems. We successfully exploit these properties to build reaction center mimics and high-potential photoanodes for artificial photosynthetic systems. I will discuss some of these systems in terms of their design principles and photoinduced properties.

INVITED LECTURE (IL -8)
Tuning the Porphycene Macrocycle - A Porphyrin Isomer

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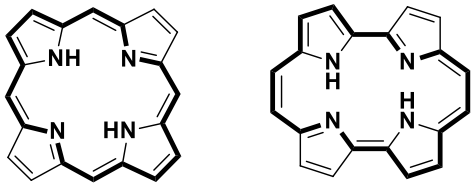
ABSTRACT

Porphycene is an 18π-aromatic rectangular tetrapyrrolic macrocycle. It also happens to be the first constitutional isomer of porphyrin to be reported via McMurry type reductive self-coupling of bipyrrole dialdehydes by Vogel.[1] In spite of its superior ability as a therapeutic in photodynamic therapy compared to porphyrin, the synthetic difficulties associated with the preparation of bipyrroles limited the development of porphycene chemistry.[2] The presence of two bipyrrolic units make porphycene more responsive towards the effect of substitution than its parent isomer.[3] Our efforts towards exploiting this attribute towards tuning the photophysical, structural and coordination chemistry of porphycene unravel several unique features of this macrocycle.[4-6]



Porphyrin Porphycene

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INVITED LECTURE (IL -9)
Synthesis and Applications of *Meso*/*β*-Functionalized Porphyrinoids

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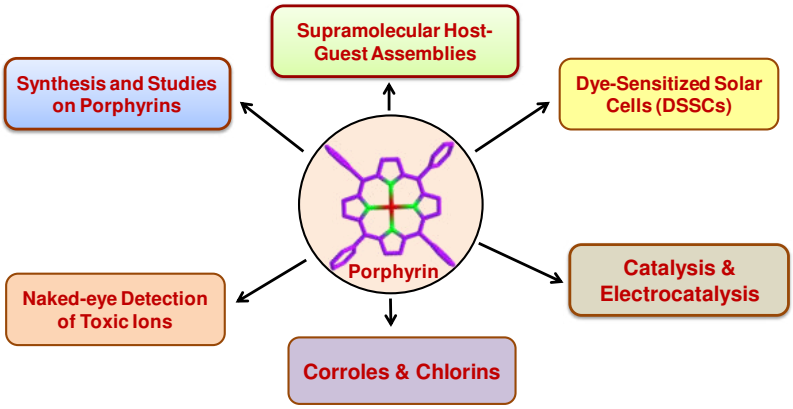
ABSTRACT

Unsymmetrical *meso*-functionalized 'push-pull' porphyrin derivatives have been widely used in the areas of dye-sensitized solar cells (DSSC), catalysis, toxic ion sensing and nonlinear optics (NLO).[1] They have been widely explored due to their ease of synthesis and facile functionalization whereas limited reports on *β*-substituted 'push-pull' porphyrinoids due to lack of synthetic methodologies. However, it is found that the latter ones exhibit unique physicochemical and electrochemical redox properties with interesting material and medicinal applications. Recently, our group has reported new series of *β*- and *meso*-functionalized porphyrins, chlorins and corroles with mixed substitutents pattern.[2,3] DFT studies and the crystal structure analyses of highly substituted porphyrins and chlorins revealed nonplanar saddle shape conformation. Notably, nonplanarity of the porphyrinoid core was controlled and modified by varying in size, shape, number and the electronic nature of *β*-substituents. These porphyrinoids exhibited highly red-shifted electronic spectra with dramatic decrement in HOMO-LUMO gap. In addition, the redox tunability was achieved by introducing both electron donating and withdrawing *β*-substituents into the tetrapyrrole skeleton which led to nonplanarity with enormous 'cross polarization'. Further, we have synthesized a series of push-pull *trans*-A_2BC/A_2B_2 porphyrin Zn(II) complexes in two steps which exhibited the power conversion efficiency (η) upto 8.8% under 1 sun illumination and the NLO behaviour highly dependent on the electron donor moiety. A new family of *β*-functionalized vanadyl porphyrins has been synthesized and utilized them as catalysts in oxidative brominaton and epoxidation reactions. These catalysts exhibited very high TOF numbers, unparalleled selectivity and are recyclable at the end of the reaction. In this presentation, the facile synthesis, spectral and intriguing redox properties of these porphyrins and their potential application in catalysis, NLO, detection of explosives and toxic anions and solar cells will be discussed in detail.[2,3]



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INVITED LECTURE (IL -10)
Porphyrin Based Self-Assembled Nanostructures for Organic Electronics

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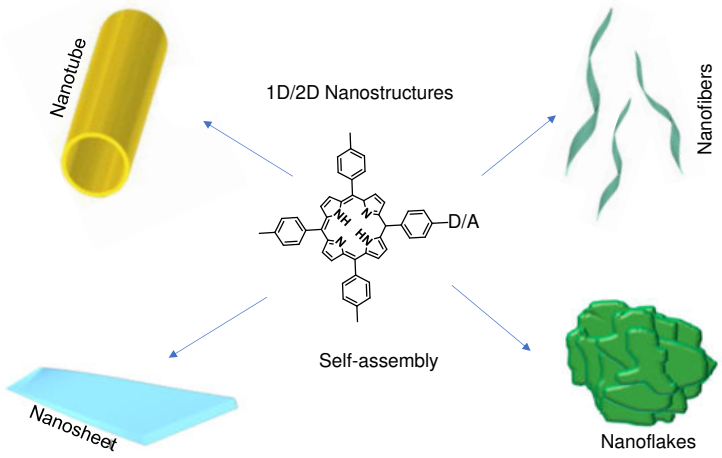
ABSTARCT

Self-assembly of π-conjugated oligomers leading to nanosized architectures, using weak noncovalent interactions is a topic of considerable importance.[1,2] Among different π-conjugated systems, porphyrin derivatives are widely used in organic electronic devices due to their electronic properties. The intermolecular interactions between π-conjugated molecules play an important role on the electronic properties when put into electronic devices. Therefore, insight on the self-assembly of these molecules to different architectures of controlled size and shape are important. In this context, preparation of 1D or 2D nanostructures of porphyrin derivatives have attracted the attention of chemists. Thereby, we have developed various donor and acceptor appended porphyrin derivatives and studied their self-assembled and electron properties. The resultant data revealed that 1D/2D nanostructures formation via diffusion controlled approach in non-polar solvents. Subsequently, these assembled structures exhibits good electronic conductivity and high charge carrier mobility promote the design of variety of organic electronics in future.



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FLASH PRESENTATION (FL -1)

Conducting Nanowires: Synthesis, Self-assemly and Electronic Properties of Porphyrin Based Donor-Acceptor systems

M. B. Mrinalini, Lingamallu Giribabu and Seelam Prasanthkumar

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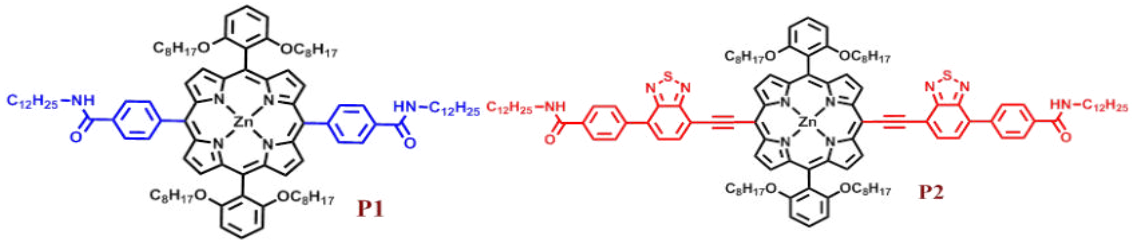
In this report, we present the design, synthesis and self assembly of porphyrin derived molecules for supramolecular self assembly studies.

1. Introduction:

Scrolling mechanism is considered as one of the significant phenomena to control the dimensionality of nanostructures. π-conjugated porphyrins are of great interest for their excellent photophysical, photochemical, electrochemical and structural properties. Extensive absorption feature, rigid, planar molecular skeleton and inherent aromatic electronic features facilitate their assembly into well-defined nanostructures with favorable optoelectronic properties.[1-3] Self-assembly of porphyrin mainly dependent on various intermolecular non-covalent interactions(hydrogen bonding, π-π stacking hydrophobic, electrostatic interactions and vander Waals forces). Remarkably, rolling of ultrathin 2D layered graphene nanosheet into 1D nanotubes perceived versatile applications in nanotechnology and medicines in the past decades.[4,5] Nevertheless, this exceptional phenomenon observed in limited 2D π-conjugated systems until now but necessary to extend the feasible organic systems rather important.owing to these limited phenomenon. we have designed molecules by Suzuki sonogashira and peptide coupling reactions **P1** and **P2** molecules.



2. Experimental Section:

Porphyrin derivatives such as **P1** and **P2** were synthesised by wherein **P1** comprising of porphyrin appended with phenyl functionalized amide (-CONH) and dodecyl chain at meso position. Whereas, **P2** possess auxiliary acceptor benzothiadiazole linked to the meso position of porphyrin and along with

amide (-CONH) and dodecyl chain discriminates P1 and P2.These porphyrin derivatives **P1** and **P2** were synthesized by Suzuki, Sonogashira and peptide coupling reactions. **P1** prepared by treatment of dibromoporphyrin with 4-(methoxycarbonyl)phenyl)boronic acid in the presence of Pd(PPh3)4 followed by hydrolysis and treated with dodecylamine in presence of HATU. On the otherhand, **P2** followed similar synthetic strategy alike **P1**, however, precursor prepared from triisopropyl silyl protected porphyrin on reaction with methyl 4-(7-bromobenzo[c][1,2,5]thiadiazol-4-yl)benzoate in the presence of Pd catalyst. Using column purification the compounds has been extracted with moderate yields.

3. Results and discussions:

Density fuctional theoretical data depits a clear discrimination on HOMO and LUMO of **P2** with the band gap of 1.96eV.Photophysical and electrochemical properties of **P1** and **P2** exhibits that **P1** remained monomeric in state and **P2** shows J-type aggregates and ease of oxidation.These aggregates has been conformed by temperature dependent studies and methanol addition studies. Infrared spectroscopic studied revealed intermolecular forces of attraction where as XRD studies reveals the packing behaviour XRD spectrum of aggregates suggest the sharp diffraction peaks observed at small and wide angle region indicates the crystalline nature. The peak at d-spacing value of 14.56 Å corresponds to the molecular length of π-conjugated benzothiadiazole appended porphyrin macrocyclic system in **P2**. Microscopic analysis suggest that **P2** showed the 2D nanosheets with an average diameter of 4 - 5 µm upon diagonal scrolling result 1D nanofibers with 1 - 1.5 µm in width and several micrometers in length. Electrochemical impedance analysis revealed that 1D nanofibers of **P2** depict electrical conductivity in the range of 1.5 ± 0.2 S/cm.[6] Thereby, these novel derivatives highlight the NIR absorption and their efficient opto-electronic characteristics promote the alternatives for inorganic semiconductors in organic electronics.

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FLASH PRESENTATION (FL -2)

Sterically hindered meta-benziporphodimethene molecules as a cell imaging tool

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ABSTRACT

Research on m-benziporphodimethenes has amplified mainly after 2008 when its fluorescence *switch-on* behavior was reported for the first time and later the cell imaging applications were also published. But the low synthetic yield and rapid oxidation have been a challenge with this compound. In this paper, we have incorporated sterically hindered groups on the meso positions and demonstrated its effect on the stability, synthetic yield and sensing properties of m-benziporphodimethene molecules. After addition of transition metal ion its fluorescence intensity tremendously increased. The NMR and UV studies have been done to confirm the formation of desired product.

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FLASH PRESENTATION (FL -3)

Exploration of an unusual mode of complexation of platinum(II) ion in naphtho-fused bipyrrole derived prophycene

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1. Introduction:-

The porphycene core, in contrast to the porphyrin core, being rectangular pose difficulty for metalation due to non-alignment of the lone pairs towards the centre. The geometry of the core is prone to modification by substitution.[1] Inner β-fused porphycenes add an extra barrier by imposing rigidity.[2] Thus there exist a vast field to explore the metalation in these not-so-vulnerable cores. Porphyrins and porphycenes are mostly observed to form mono-metallic complexes. The rarely reported bimetallic complex exhibit trans conformations.[3] There has been one unique report for synthesis of cis-dipalladium complex where the macrocyclic ligand gets deformed to effectively bind to the metal atoms. It is interesting to study how these macrocylic ligands get structurally modified upon metalation.[4]

2. Experimental Section:

Tetraisopropyldinaphthoporphycene (DNP) was synthesized via McMurry coupling as per the reported procedure.[2] DNP when treated with bis-benzonitrileplatinumdichloride in presence of benzonitrile as the solvent resulted in complex DNPPt1, with platinum satisfying two valencies with DNP, one with chloro and one with benzonitrile. On replacement of the solvent with o-dichlorobenzene, another complex DNPPt2 was obtained with the fourth ligand replaced by o-dichlorobenzene.

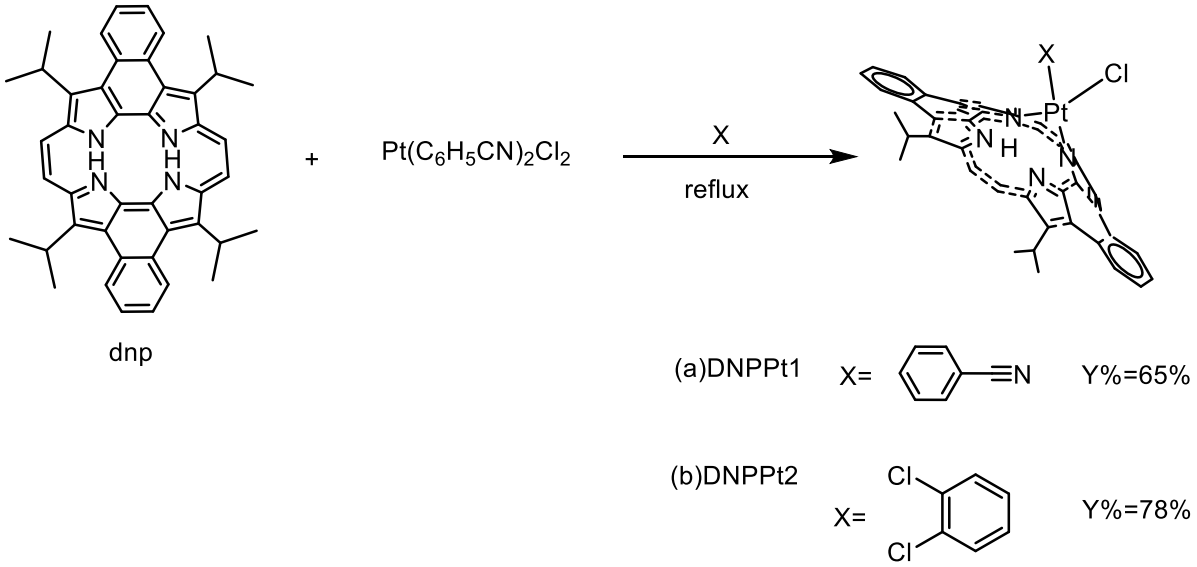

Figure 1: Synthesis of platinum complexes of tetraisopropyldinaphthoporphycene.

3. Results and Discussion:-

Two novel out of plane platinum complexes of tetra isopropyl dinaphthoporphycene were synthesized which display substantial bathochromic shift in absorption spectra compared to the freebase.

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FLASH PRESENTATION (FL -4)

SYNTHESIS AND CHARACTERIZATION OF N-FUSED PORPHYRIN IRIDIUM COMPLEXES TOWARDS CATALYSIS

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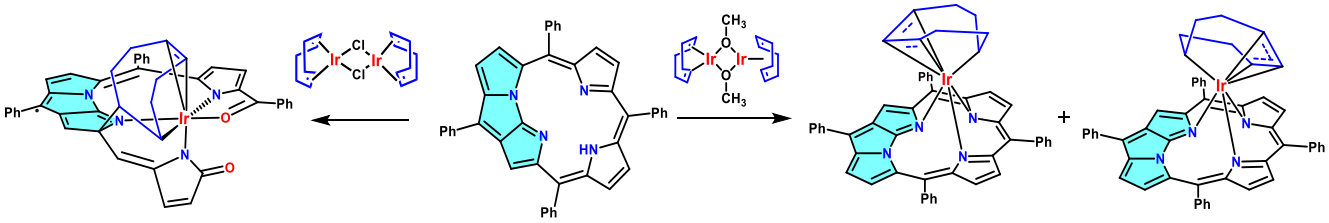
ABSTRACT

N-fused porphyrin (NFP; **1**), an asymmetric porphyrin analogue with an inner fused tri-pentacyclic pyrrole ring, provides a monovalent tridentate coordination core with an 18π aromatic circuit. Several sitting atop metal complexes of NFp with rhenium(VII), manganese(I), iron(II), ruthenium(II) and tungsten(VI) at the N3 core were reported to date.[1] This is quite different from the parent porphyrin ligands, where metal centers are accommodated inside the macrocyclic plane. The unique geometry of the metal centers in the NFP complexes affords specific reaction space for catalytic transformation of the substrates. For instance, the corresponding rhenium(VII)-NFp complex has already proved to work as a catalyst for deoxygenation of pyridine *N*-oxides with high turnover numbers.[2] In this regard, the coordination chemistry of NFP can be extended to the other transition metals for catalytic application



Ir-3 **NFP, 1** **Ir-1a**

A sandwich complex of NFP iridium cyclooctadiene has been synthesized from free-base **1** by treating with (1,5-Cyclooctadiene)(methoxy)iridium(I) dimer. Based on the crystal structure analysis, two rotational isomers namely **Ir-1a** and **Ir-1b** were observed as co-crystals. The prime significance of these complexes, **Ir-1a** and **Ir-1b**, relies on the transformation of 1,5-cyclooctadiene (COD) ligand into an isomeric homologue comprising of an η^3-allylic and σ-bonded C_8H_{12} ring upon metalation. **Ir-1a** and **Ir-1b** formed in equivalent proportion, as evident from NMR and X-ray crystallographic analysis, differs only in the orientation of η^1-η^3 COD moiety with respect to the NFP iridium skeleton over a two-dimensional space.

An oxidized, broken π-conjugated, N-fused structural analogue coordinated to iridium and 1-cyclooctene, **Ir-3** was obtained in a similar approach. There are several reports of nucleophilic ring opening in **1,** giving out parent N-confused porphyrin. Whereas in **Ir-3**, the fused tri-pentacyclic ring is retained intact with oxidation of C-C bond connecting the pyrrolic carbon and meso carbon atom. This is the first case where the tetrapyrrolic N-fused porphyrin skeleton is directly oxidized leading to an interrupted π-conjugated, octahedral, iridium cyclooctadiene dioxo complex.

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FLASH PRESENTATION (FL -5)

Synthesis and Photophysical studies of Donor–Acceptor-Type Near-Infrared (NIR) Absorbing Bis(4′-tert-butylbiphenyl-4-yl)aniline – Aza-borondipyrromethene (Aza-BODIPY) Dyes

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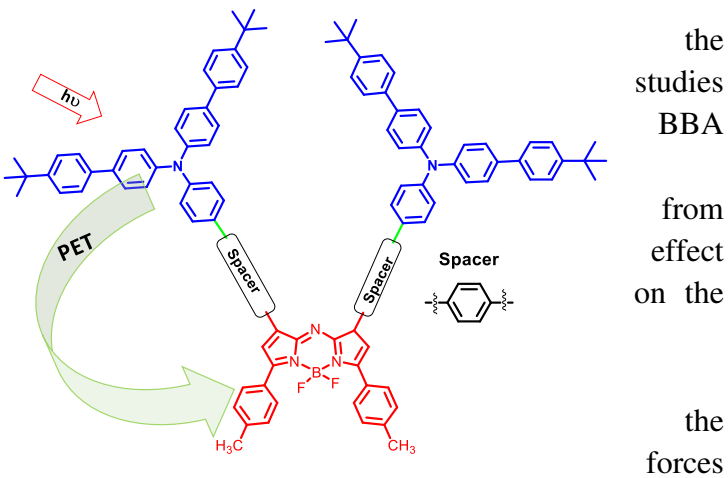
ABSTRACT

Donor-Bridge-Acceptor (D-B-A) systems that mimic the photo-induced electron transfer processes in natural photosynthesis, stand out as primary building blocks for light harvesting devices.[1] Several D-B-A systems involving porphyrin, phthalocyanine like chromophores as electron donors and 2-D (quinones) and 3-D molecules (fullerenes) as electron acceptors have been reported. Generally, Borondipyrromethene (**BODIPY**) exhibit large molar absorptivity, relatively high fluorescence quantum yields, and relatively long singlet excited state lifetimes. As a result, they have been extensively used as energy-absorbing and transferring antenna molecules in photosynthetic antenna-reaction center mimics, and PET donor and acceptor entities.[3]

In the present study, a series of donor-acceptor dyads containing Aza-BODIPY as electron acceptor and Bis(4′-*tert*-butylbiphenyl-4-yl)aniline as an electron donor, separated with spacers of varying length, i.e., phenyl have been synthesized and well characterized by using ^{1}H NMR, optical absorption and steady state fluorescence studies. Optical absorption studies in solvents of different polarity revealed the presence of very minimal ground state interactions between the two chromophores. Steady state fluorescence studies have revealed that, upon photo-excitation of BBA moiety, the emission of BBA is quenched from showing a photo-induced electron transfer effect **^{1}BBA*** to **Aza-BODIPY**. Interestingly, the of quenching was observed to be dependent on the spacer present between BBA and Aza-BODIPY moieties and also on the solvent polarity. Electrochemical studies to calculate the redox potentials of the dyads and the driving forces of electron transfer (ΔG_{CS}) and the computational studies to visualize the HOMO and LUMO of the dyads



are performed. Time-resolved fluorescence studies to monitor the rate of fluorescence decay due to ultrafast electron transfer in these dyads are in progress.

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FLASH PRESENTATION (FL -6)

Pd(II) porphyrins for Singlet Oxygen Generation and Photocatalysis

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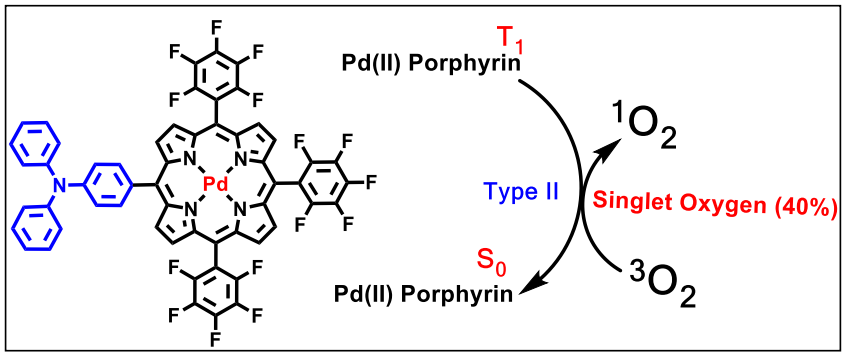
ABSTRACT

Metalloporphyrins, are well known prosthetic groups present in the various proteins and enzymes; and they are responsible for the catalytic activities of these biomolecules.[1] In recent years, metalloporphyrins have been developed as important synthetic tools for organic transformations. Pd(II) and Pt(II) porphyrins are known for phosphorescence emission and relatively long triplet state lifetime (micro seconds); they can produce singlet oxygen by type II pathway, after photo-irradiation. In this work synthesis and spectral studies of A_3B and A_2B_2 type porphyrins and their Pd(II) complexes are reported. The *meso*-positions of the porphyrin ring are substituted with electron withdrawing and electron rich heterocycles. The singlet oxygen efficiency of the metalloporphyrins was in the range of 45-63% in different solvents. The photo-oxidation reactions gave exciting results in acetonitrile solvent with 80-98% yield.[2]

Our group at IIT Gandhinagar is involved in the chemistry of D-A porphyrins,[3] porphyrin-sugar conjuagtes[4] and aza-BODIPYs[5] linked to suitable donor moieties to study energy transfer and chemo-sensing applications. Here we present the synthesis and photophysical studies of palladium porphyrins for photo-oxidation of aldehydes to carboxylic acids.



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FLASH PRESENTATION (FL -7)

RHODIUM-PORPHYRINS COMPLEXES: PREPARATION, HETEROGENIZATION & ITS CATALYTIC APPLICATION FOR HYDROGENATION OF BIOMASS MODEL COMPOUND

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Highlights:

• Inspired from naturally existing metalloporphyrin derivatives and its biological applications.

•Synthesized boimimicking porphyrin complexes, Rhodium containing *meso*-tetrakis-(4-carboxypenyl)porphyrin) and *meso*-tetraphenylporphyrin).

•Hydrogenation of boimass model compound yields value added products such as γ-valerolactone (Biofuel additive) and 1,4-pentanediol (Green solvent).

1. Introduction

Porphyrins and metallo-porphyrins are fascinating macro-molecules, which are involved in a number of synthetic transformations and have great interest in industry and academic researchers. Porphyrin and its derivatives are well-known example of naturally occurring macrocylic compounds and play a significant roles in biological life cycles. These compounds have strong affinity towards the metal ions and these are known as potential tool on biological, bio-chemical, photochemical applications [1, 2]. On the other-hand transition metal (Co, Fe, Ni, Ru, Rh, Pt, Pd, Ir, etc.) based organo-metallic complexes, in particular group VIII-based complexes are shown great impact on various chemical, pharmaceutical processes due to their immense redox potential [3]. It will be interesting to introduce group VIII metal Rh, into the cavities of porphyrin and porphyrin derivatives and heterogenise by encapsulating on functionalized surface materials and subsequently explore its catalytic activity in various important organic transformations. The present work focuses on preparation and surface grafting of a rhodium (Rh) containing *meso*-tetraphenylporphyrin (RhTPP) and *meso*-teracarboxyphenylporphyrin (RhTCPP) molecules and explore its catalytic activity in industrially important hydrogenation reaction, escpially hydrogenation of biomass model compound levulinic acid to value added products.

2. Experimental Section

meso-Tetraphenylporphyrin (TPP) and *meso*-tetrakis-(4-carboxyphenyl)porphyrin were prepared as per the standard procedure described in literature [1, 2, 3]. Rhodium complexes RhTPP and RhTCPP, were prepared by refluxing equi-molar mixtures of respective porphyrin derivative with corresponding metal

salt in presence of suitable solvent. The resultant complexes were heterogenized on amino functionalized SBA-15 molecular sieves. [4,5,6] Both homogeneous and heterogeneous macro-molecular catalysts were thoroughly characterized by various analytical and spectroscopic techniques such as FT-IR, UV-Vis, TGA, powder XRD, 1H NMR, Mass, CHNS studies. The catalytic activity of material was screened for hydrogenation of biomass derived levulinic acid.

3. Results and Discussion

^{1}H NMR studies support RhTPP and RhTCPP formation. In the ^{1}H NMR spectra, typical peak was appeared around highly shielded region (−2.74 ppm), corresponding to the N−H protons of pyrrole unit present in TPP) and it was disappeared upon Rh incorporation into RhTPP which confirms that the Rh was connected to the nitrogen center of the TPP ligand. Similar trend was observed in RhTCPP complex. The successful anchoring of the RhTPP and RhTCPP on the amino silane modified SBA-15 material (SBA-AM) was observed and confirmed through X-ray diffraction (XRD) and nitrogen sorption studies. The shift in X-ray diffraction (XRD) patterns and s distinct, sharp uptake in the *p/po* range of 0.6 − 0.8, significant reduction in BET surface area and BJH pore volume compared to the parent sample (SBA-AM), which supports the encapsulation of RhTPP and RhTCPP into the mesoporous channels of amino functionalized SBA-15. RhTPP/RhTCPP and the corresponding heterogeneous catalysts are shown as promising catalyst for hydrogenation of biomass derived levulinic acid to industrially important γ-valerolactone and 1,4-pentanediol with complete conversion at moderate reaction conditions. The product was confirmed by GC and FT-IR spectroscopic methods. All homogeneous catalysts were studied for several cycles. γ-valerolactone and 1, 4-pentanediol were obtained as the major products. The homogeneous catalysts showed conversion levels of 90–100 % even after several cycles. For the heterogeneous catalysts the conversion was decreased considerably after the third cycle. This loss in activity might be due to the chemisorption of reactant molecules on the surface of mesoporous materials, which block the active sites.

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FLASH PRESENTATION (FL -8)

A NOVEL PORPHYRIN-BODIPY CONJUGATE WITH PANCHROMATIC ABSORPTION FOR DSSC

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The poster gives a glimpse of synthesis and photophysical properties of a porphyrin-BODIPY conjugate for its application in DSSC.

1. Introduction

Dependence on solar energy, as the most available greener source of renewable energy, received much attention due to the fast diminishing of non-renewable energy sources. Though dominated by the solid state devices comprising silicon based materials for the long time, recently, dye sensitized solar cells have shown promising features including ease of fabrication, low cost production and wide tunability of the photosensitizers.[1] In this aspect, porphyrins due to their intense absorption in the visible region and tunable electrochemical properties got wider attraction in DSSC. Though Grätzel and coworkers demonstrated a series of D-π-A based porphyrin dyes such as YD2-*o*-C8 and SM315, achieving an efficiency upto 13%,[2,3] but they lack significant absorption in the NIR region which contains significant flux of photons. Recently our group developed a very efficient NIR active naphthobipyrrole based BODIPY dye,[4] which we have employed here as an acceptor group in conjugation with diarylamine donor substituted porphyrin moiety to give a novel porphyrin-BODIPY conjugate. In this poster, we present the synthesis of this porphyrin-BODIPY conjugate and its photophysical properties also will be discussed.

2. Experimental Section

The synthesis of porphyrin-BODIPY conjugate (PBC) comprises of two parts – a donor substituted porphyrin moiety and an acceptor located BODIPY unit. The donor substituted porphyrin can be further split into two, comprising the synthesis of diarylamine-donor and the synthesis of ethyne linked bromodiarylporphyrin. The Buchwald-Hartwig coupling of 4-hexyloxy aniline and 4-hexyloxy bromobenzene yielded the diarylamine-donor, while the condensation of dipyromethane with 2,6-bisoctyloxy benzaldehyde, prepared as per the reported procedure, yielded the diaryl porphyrin. The diaryl porphyrin was subjected to bromination, ethynylation and further bromination in sequence to yield the ethyne linked bromodiarylporphyrin, which was coupled with the diarylamine to give the donor substituted porphyrin moiety. The other BODIPY part obtained from the naphthobipyrrole substituted

dipyrromethane through oxidation and treatment with boron trifluoride etherate, where the dipyromethane was in turn synthesized from the condensation of naphthobipyrrole monoester with 4-iodobenzaldehyde, was attached to this donor substituted porphyrin moiety via sonogashira coupling led to the formation of porphyrin-BODIPY conjugate (PBC) in good yield.

3. Results and Discussion

As the porphyrin dyes with D-π-A structure have shown higher efficiencies, we have opted for this structure with hexyloxy groups appended diarylamine, because of their stronger electron donating capability,[5] as donor and bisoctyloxyphenyl substituted porphyrin and carboxy substituted BODIPY as acceptor. The theoretical calculations revealed the significant contribution of porphyrin as a donor since the electron density of HOMO remained only on the donor substituted porphyrin and the electron density of porphyrin is completely absent in case of LUMO, which was not observed in the case of previous reports of porphyrin dyes such as YD2-*o*-C8 and SM315. Since the LUMO lies completely on the acceptor BODIPY unit it may probably increase the electron injection efficiency. The synthesized porphyrin BODIPY conjugate (PBC) was well characterized by ^{1}H NMR, HRMS and spectroscopic techniques. PBC displayed a panchromatic absorption upto 800 nm with an emission maximum at 743 nm. The significant increase in the intensity and red shift of the Q-bands when compared to the previously reported porphyrins might play an important role in increasing the efficiency of the solar cell.

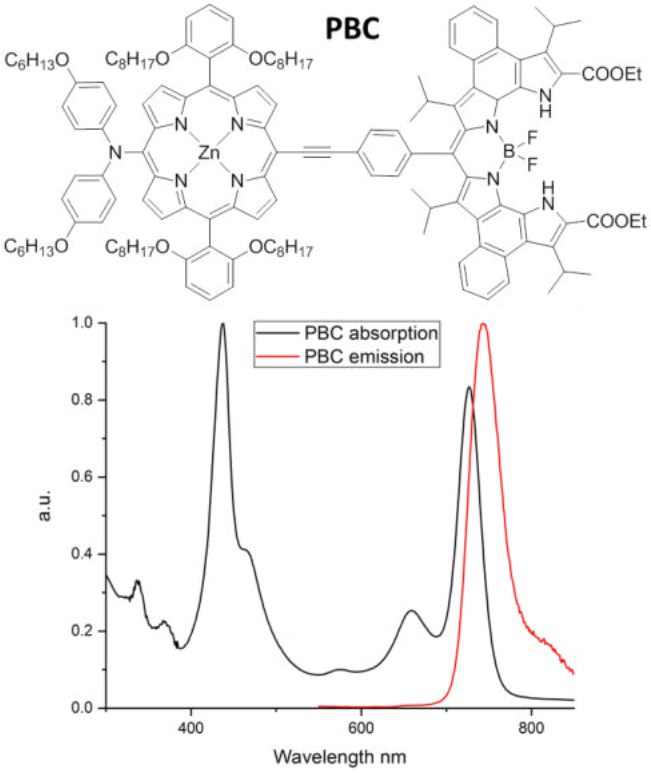

Figure 1. Structure of PBC with its absorption and emission spectra

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FLASH PRESENTATION (FL -9)

NIR BODIPYs: Synthesis and Biological Studies

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ABSTRACT

Fluorescence spectroscopy and organic dyes are employed for sensing the chemical species inside the cells or to collect information about biological responses.[1] Small fluorescent molecules have played a substantial role in understanding the biological systems and visualization of living cells and tissues.[2] The BODIPYs (difluoroboron-dipyrromethenes) are highly versatile neutral molecules with quantum yields and good photostability.[3] BODIPYs have been used for variety of applications *viz*. as biological labels, as fluorescent switches and sensors,[4] as anti-cancer agents in PDT (photodynamic therapy).[5]

Here we present the synthesis of NIR BODIPYs with strong absorption and fluorescence in the red region (550-800 nm). The aromatic groups like *N*-butylcarbazole/ *N*-butylphenothiazine/ benzothiadiazole were attached to the C-5 position of the dipyrrin core. Also, the thioglycosylated BODIPYs having glucose and galactose groups on the dipyrrin unit were prepared. The *in-vitro* studies of the selected BODIPYs in HeLa and A549 cancer cell lines, indicated significant localization in the endoplasmic reticulum and mitochondria of the cancer cells. These BODIPYs can be potentially used for live cell imaging and as theranostic agents for caner.

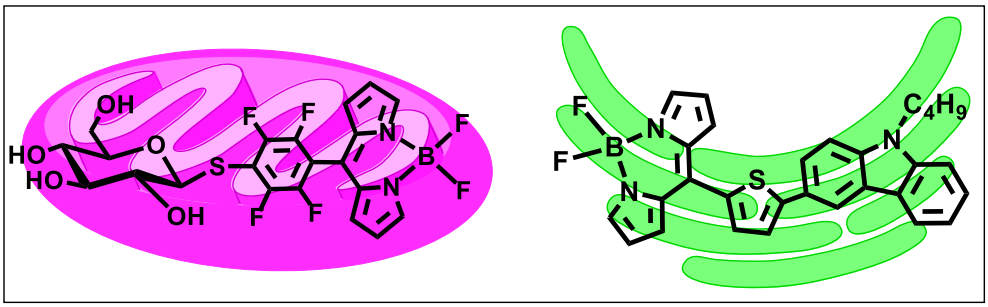

Figure 1. Schematic of Glucose and Carbazole linked BODIPYs targeting cell organelles.

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FLASH PRESENTATION (FL -10)

Imidazole substituted Porphyrin Sensitizers for Dye-Sensitized Solar Cell Applications: Effect of p-methoxyphenyl group

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In this conference, we present the synthesis of a series of Imidazole substituted Porphyrin Sensitizers coded as LG24, LG25, LG26, LG27 and their structural electrochemical and photovoltaic properties.

1. Introduction

The functionalization of the porphyrin macrocycle allows to produce various push–pull structures and/or π-extensions have made porphyrins panchromatic in visible and even near-infrared regions for the application of DSSC. Consequently, porphyrin sensitizers have exceeded PCE of 13%, which is higher than those of well-established highly efficient DSSCs based on ruthenium complexes. Further, high-performance porphyrin dyes have been developed in the last few years. In this presentation, we describe the synthesis of a series of Imidazole substituted Porphyrin Sensitizers coded as LG24, LG25, LG26, LG27. The structural, spectral, electrochemical and photovoltaic properties also will be discussed.

2. Experimental Section

Synthesis of LG24-LG27: Compound **3** (250 mg, 0.15 mmol) and TBAF (0.8 mL, 1 M in THF) was dissolved in anhydrous THF (25 mL). The solution was stirred at 0°C for 30 min under inert atmosphere. After completion of the reaction it is quenched with H_2O and then extracted with CH_2Cl_2. The organic layer was dried over anhydrous Na_2SO_4 and the solvent was removed under reduced pressure. The obtained residue (190 mg, 0.15 mmol), and respective acceptor (0.56 mmol) were dissolved in a mixture of anhydrous THF (25 mL) and Et_3N (8 mL) under nitrogen atmosphere. To this, $Pd_2(dba)_3$ (44.12 mg, 0.036mmol) and $AsPh_3$ (92.3 mg, 0.28mmol) were added. The mixture was degassed for 20 min with an inert gas and refluxed for 17h. After completion of the reaction the solvent was removed under reduced pressure. The residue was purified by silica gel column chromatography (CH_2Cl_2/MeOH = 20/1), recrystallized from MeOH/Ether to give corresponding sensitizer.

3. Results and Discussion

The synthetic pathway of the porphyrin sensitizers **LG24**-**LG27** was illustrated in Scheme 1. The intermediates D1 and D2 were synthesized by condensing either anisolebenzil or benzyl with 4-ethynyl benzaldehyde and *P*-anisidine in acetic acid, respectively. Compound **4** was synthesized by adopting Suzuki coupling reaction between **3** either with **D1** or **D2**. Finally, the porphyrin sensitizers **LG24**-**LG27** were synthesized by deprotection of compound **4** by using tetrabutylammonium fluoride solution (TBAF), and followed by coupling reaction with respective bromo aromatic acids by using $AsPh_3$ and $Pd_2(dba)_3$ reagents as a results affordable yields 40-60% obtained for the **LG24 to LG27**. All these

newly synthesized porphyrin sensitizers were characterized by various spectroscopic techniques and electrochemical methods including *in-situ* electrochemical methods. Finally, fabricated the DSSCs and PCE of **LG24** and **LG26** sensitizers have showed 9.64 and 9.87%, respectively, which is higher when compared to **LG25** and **LG27** (5.79% and 5.16%) sensitizers. Therefore, the effect of the extended methoxy group on phenyl ring of a triphenyl imidazole, anchoring group, benzothiadiazole auxiliary acceptor with cyanoacrylic expressively contributed to improving the efficiency

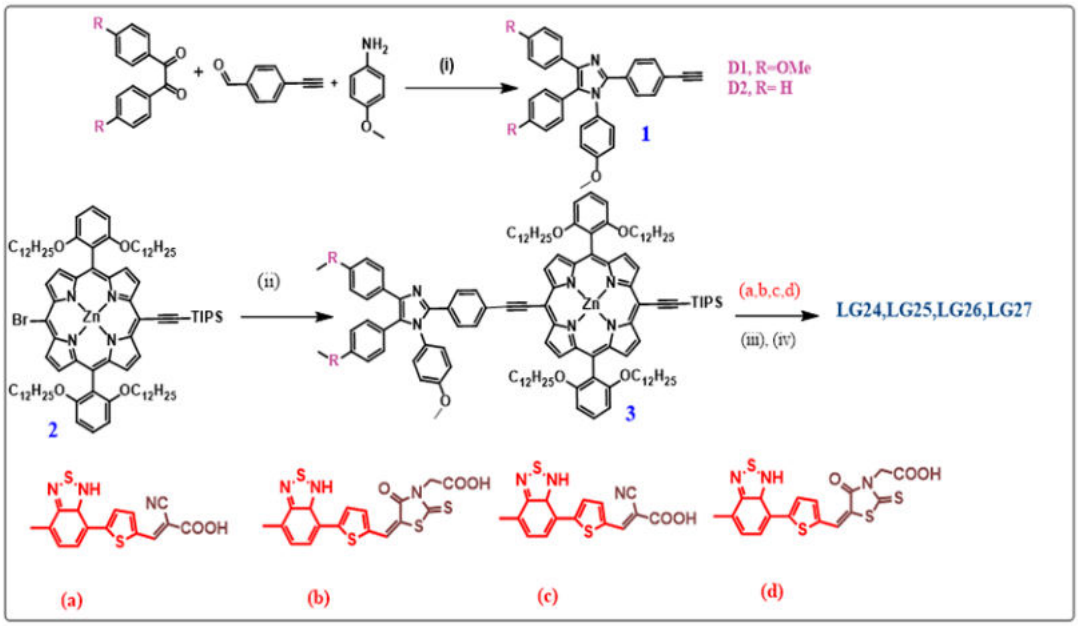

Figure: 1 Synthetic Scheme of LG24-LG27

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FLASH PRESENTATION (FL -11)

DFT STUDY ON THE MECHANISM OF THE ELECTROCHEMICAL REDUCTION OF CO_2 TO ETHANOL CATALYZED BY COBALT CORROLE.

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Electrochemical conversion of CO_2 to alcohols is one of the most challenging methods of conversion and storage of electrical energy in the form of high-energy fuels. Herein, we demonstrate DFT study on the mechanism of the electrochemical reduction of CO_2 to ethanol using a cobalt(III) triphenylphosphine corrole complex, which contains three polyethylene glycol residues attached at the meso-phenyl groups.

1. Introduction

The electrochemical reduction of CO_2 to fuels is a sustainable strategy to solve the current energy crisis which at the same time circumvents the problem of environmental pollution. For such a transformation to occur, it is highly desirable that the catalyst works at low overpotential generating high current density with long term stability and selectivity. The development of inexpensive catalysts for the electrocatalytic reduction of CO_2 to ethanol in aqueous environment is a challenge. Recently we have published[1] a work on the reduction of CO_2 to alcohols, formaldehyde etc. with a Co-corrole modified carbon paper electrode working at a low overpotential (−0.8 V vs. RHE) and show the long-term activity of Co-corrole modified carbon paper electrodes, making it as robust as metallic copper electrocatalysts. Here we report the theoretical study of electrochemical reduction of CO_2 by Cobalt Corrole complex using DFT methods.

2. Experimental Section

All the geometries were fully optimized by employing density functional theory (DFT) using a range separated hybrid functional wB97XD which contains empirical dispersion correction term by Grimme16 as implemented in Gaussian 09 quantum mechanical software package. The geometry optimizations were carried out using a Pople basis set of valence triple ζ quality (6-311G) over all the atoms (Co, S, P, O, N, C and H). We have optimized both low and high spin geometries for all the compounds. The solvent water was considered using the integral equation formalism of the polarized continuum model (IEF-PCM). DFT calculations were done using a Co-Cor complex in which the PEG(7)-OMe unit was replaced with PEG(1)-OMe unit. Analytical vibrational frequencies were computed to verify the nature of the stationary states. The results obtained were used to calculate the binding energy differences between various geometries in the methanol and ethanol pathway. Only the Co-Corrole molecule was modelled and not the support electrode (carbon paper) since the latter doesn't

influence the electroactivity. Further, theoretical redox potential calculations were carried out using self-consistent reaction field (SCRF) approach based on the integral equation formalism of the polarized continuum model (IEF-PCM) level of theory and the solvation free energies (ΔGso) for the complex in all the oxidation states (Co(III), Co(II) and Co(I)) was found out using default options as given in Gaussian 09.

3. Results and Discussion

Physisorption and subsequent activation of CO_2: On reduction of the metal center in Co-Corrole from Co(III) to Co(I), the investigation of Mulliken charges of the two species involved in the reduction process, revealed that charge on the metal center changed from +0.852 (Co(III)) to +0.799 (Co(I)) while the charges on nitrogen atoms of both the species have an average value of ca. -0.72. In the next process, CO_2 molecule gets adsorbed onto the 2 electron reduced Co(I) centre and the CO_2 molecule is having a linear arrangement (<O–C–O: 175.9°, C–O: 1.18 Å) which evidences the presence of a weak interaction (physisorption) between CO_2 and the metal center (Fig.1 (A)) since the electronic structure of both moieties is not having appreciable perturbation. This initial adsorption is followed by the binding of CO_2 molecule *via* its carbon atom to the metal center resulting in the formation of metal bound carboxyhydroxyl intermediate [Co(II)–COOH]– where the protonated CO_2 molecule is found in a bent form (<O–C–O: 118.5°, C–O: 1.22 and 1.38 Å) (Fig.1 (B)). The loss of linearity is due to the electron charge transfer from the metal center (Co(I)) to the CO_2 molecule which results in the orientation of the two CO bonds away from the metal containing plane with concomitant oxidation of Co(I) to Co(II). During this process, the charge on the metal center in [Co(II)–COOH]– changes to +0.824 which is intermediate to that of Co(III) and Co(I) and the charges on the carbon and oxygen atoms in CO2 (C = +0.30, O = -0.41 and -0.58) were found to be greater than that of the free CO_2 (C = +1.05; O = -0.52 each). Similarly, each and every intermediate in the CO_2 reduction pathway was optimised and energy was calculated which corroborated the experimental results.

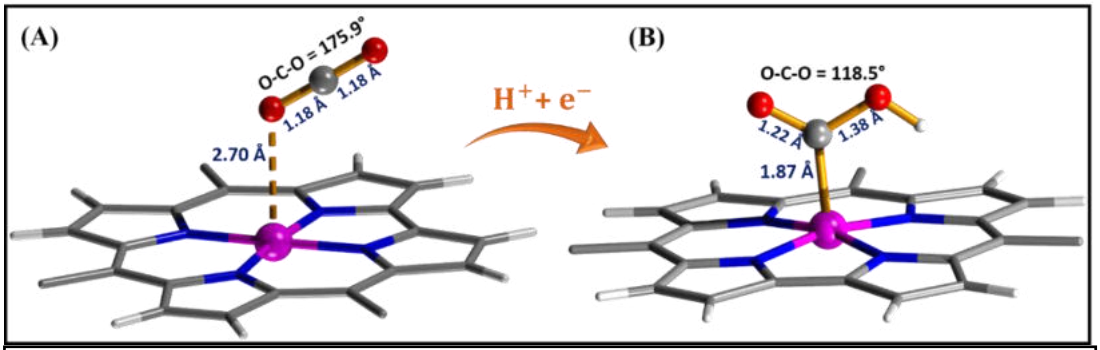

Figure 1. Optimized structures of (A) [Co(I)-CO2 adsorbed]2– and (B) [Co(II)-COOH]– at wB91XD/6-311g level of theory (For clarity S-PEG(7)-OMe units are not shown).

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FLASH PRESENTATION (FL -12)

Effect of substitution on Geometry and Intramolecular Hydrogen-Bond Strength on meta-benziporphodimethenes: a new porphyrin analogue

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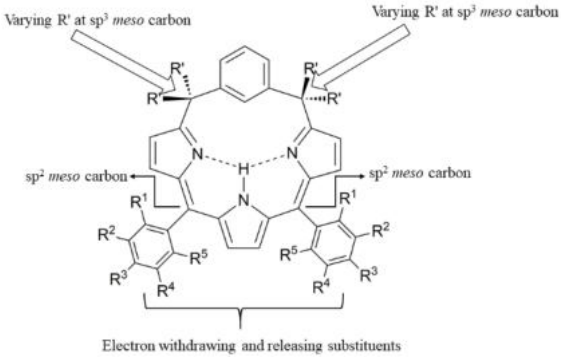
ABSTRACT

The inner-core hydrogen bond plays a vital role in the stability of freebase *meta*-benziporphodimethene molecules.[1,2,3] The present work is devoted to the estimation of the strength of this hydrogen bond and the factors affecting it. In this study, we have varied the substituents at sp^2 and sp^3 *meso* positions and investigated their effects on the inner core geometry using Density functional theory technique. A fragmentation based method called the Molecular Tailoring Approach has been used for the demonstration of Hydrogen bond energy in different systems.[4,5] The results were quite fascinating as these molecules showed effectively strong H-bonds upon increasing bulkiness on sp^3 *meso* carbons, in the presence of electron-withdrawing groups substituted phenyl at sp^2 *meso* positions.



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FLASH PRESENTATION (FL -13)
Synthesis of naphthofused oligomer with single helical conformation

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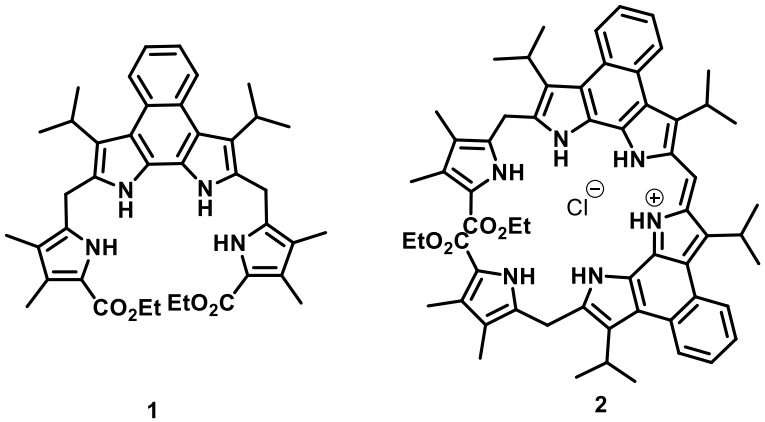
1. Introduction

Polypyrrolic molecules play an important part in porphyrinoid chemistry as they are important precursors for many porphyrinoids and biomolecules. Open chain oligomers can adopt helical structure and exhibit interesting properties like absorption in visible to NIR regions, unique metal coordination, anion binding abilities.[1.]

2. Experimental Section

Acid- catalysed condensation of diisopropylnaphthobipyrrole with ethyl 5-(acetoxymethyl)-3,4-dimethylpyrrole-2-carboxylate gives tetrapyrrole diester, **1** along with hexapyrrole diester, **2**. Changing the catalyst from p-TSA to $POCl_3$ gives hexapyrrole diester exclusively.



1 2

3. Results and Discussion

Tetrapyrrole diester, **1** and hexapyrrole diester, **2** has been characterised by NMR, and mass spectrometry. Structures has been confirmed by Single crystal XRD. Compound **2** shows monoprotonation and is stabilised by Cl^- and exhibits an interesting helical structure.

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FLASH PRESENTATION (FL -14)

TOWARDS DOUBLY FUSED PYRENE DIPORPHYRIN: SYNTHESIS AND PRELIMINARY CHARACTERIZATION

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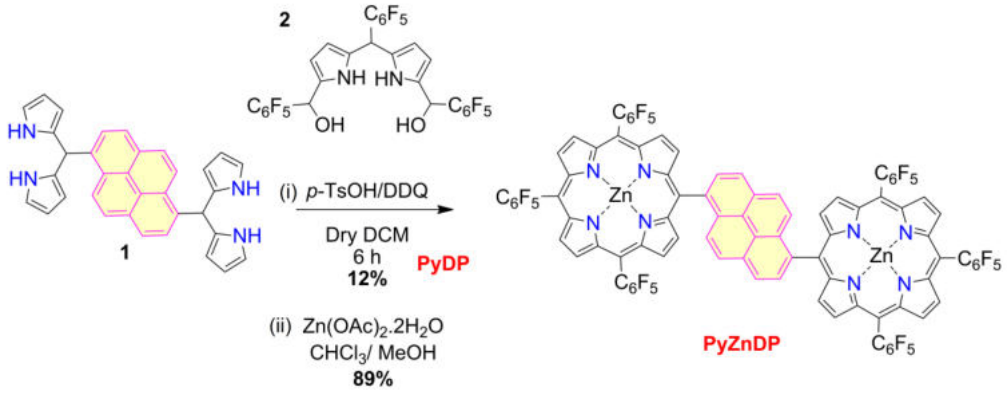
ABSTRACT

Diporphyrins that are directly fused with Polyaromatic Hydrocarbons (PAH's) have promising applications in the field of optoelectronic devices, sensors, photovoltaic devices and two photon absorption (TPA). This is due to the extended π conjugation and flexible electronic systems depending on the peripheral modification of these systems. In this study, synthesis of a metallated Pyrene Diporphyrin (**PyZnDP**) was carried out by functionalizing the pyrene moiety followed by cyclization with a meso-aryl dipyrromethane (**DPM**). Oxidative ring closure using Scholl reaction to afford a *meso*, β-doubly fused Pyrene Diporphyrin (**FPyZnDP**) and the strategy is yet to be optimized. The fused product is expected to be planar and exhibit absorption in the near IR region due to the highly conjugated structure of pyrene sandwiched between two porphyrin rings. This will provide scope for its application in optoelectronic and photovoltaic devices.



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FLASH PRESENTATION (FL -15)

Two-electron Oxidation of a Twisted Non Anti-aromatic 40π Expanded Isophlorin

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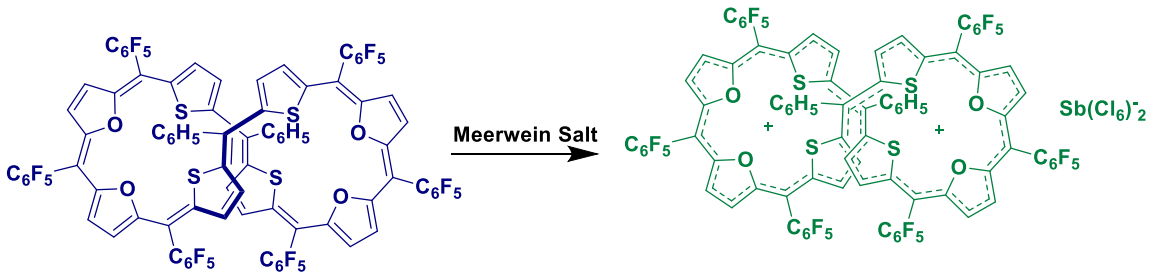
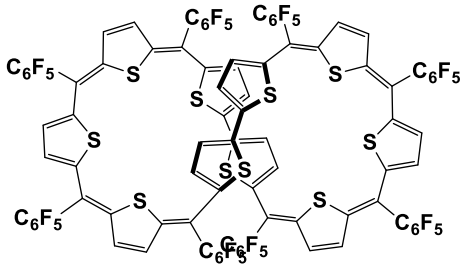
ABSTRACT

Expanded isophlorins are typical examples for stable anti-aromatic systems[1-2]. Paratropic ring current effects are observed in their NMR spectra mainly due to their planar conformation. Such molecules are vulnerable to redox reactions similar to metal ions. Hence they are also referred to pseudo-metals. Large expanded porphyrins adopt figure-of-eight topology owing to their structural flexibility. While this is very common amongst porphyrinoids, similar observation is not common for expanded isophlorins. In fact, the only report of a 40π octa-furan[3] expanded isophlorin, demonstrated a rare planar structure for a macrocycle with eight heterocyclic units. Herein we report the synthesis of the first twisted 40π expanded isophlorin and also its two-electron oxidation to a 38π dication[4]. It sustains the twisted conformation for both 4nπ and (4n+2)π electrons macrocycles. Due to the non-planar conformation, they do not display ring current effects in their respective ^{1}H NMR spectrum. NICS calculations reveal the non-antiaromatic and non-aromatic features for the neutral 40π and the 38π dication species respectively.



Further in continuation to the above work we desired to explore the chemistry of higher Isophlorins. With the same aim we have synthesized 48π deca-thiophene expanded isophlorin. It also exhibited figure of eight conformation and expect to display similar two-electron redox properties.



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FLASH PRESENTATION (FL -16)

DIBENZOTHIOPHENE/ FURAN EMBEDDED PORPHYRINOIDS

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In this context we have prepared a series of dibenzothiophene/ furan (DBT/ DBF) embedded porphyrinoids namely calixsapphyrins, heteroporphyrins and hexaphyrins and studied their structural electrochemical and spectral properties.

1. Introduction

Porphyrins are tetrapyrrolic 18π aromatic system and present at the active sites of several very important biological processes. Expanded porphyrins are conjugated macrocycles with more than four pyrrolic rings or methine carbons and known for their applications as anion sensors. In recent times, new types of porphyrinoid macrocycles in which one or two pyrroles are replaced with other polycyclic aromatic hydrocarbons (PAHs) have drawn particular attention because these macrocycles opened routes for studying novel reactivities and intriguing π-conjugation phenomena in macrocyclic systems and also provide an unique macrocyclic environment to explore coordination and organometallic chemistry.We recently reported the dibenzofuran/dibenzothiophene-based hybrid macrocycles exhibiting the features of both contracted macrocycles, subporphyrins and triphyrins and showed that these macrocycles can act as good coordinating ligands by synthesizing their Re(I) complexes. A perusal of literature reveals that reports on dibenzothiophene/ furan incorporated porphyrins and expanded porphyrins are scarce. In this context we have synthesised several dibenzothiophene/ furan embedded porphyrins, sapphyrins and hexaphyrins. The structural, spectral and electrochemical properties were explored.

2. Experimental Section

The synthesis of dibenzofuran/dibenzothiophene embedded bis-dithiacalixsapphyrins involved condensing one equivalent of appropriate dibenzofuran or dibenzothiophene tripyrrane with one equivalent of various bithiophene diols in CH_2Cl_2 in the presence of one equivalent of TFA at room temperature for 30 min succeeded by oxidation with DDQ in open air for additional 30 min followed by its column chromatographic purification afforded pink coloured *bis*-dithiacalixsapphyrins in 5-7% yield. For the preparation of heteroporphyrins similar technique was made use of where the similar tripyrrane(*meso* substituent was replaced by thienyl instead of tolyl) was condensed with different heterodiols in presence of TFA followed by DDQ oxidation to yield green coloured DBT incorporated heteroporphyrins in 6-7% yield. The hexaphyrin synthesis was carried out by treatment of dibenzothiophene tripyrrane with various aldehydes (pentafluoro, cyano and nitro) followed by open air oxidation and thus yielded the blue coloured macrocycle in decent yield.

3. Results and Discussion

Bis-Dithiacalixsapphyrins were charactersied by various NMR techniques. The resonances were quite suggestive of the non aromatic and highly symmetric nature of the macrocycle. Absorption spectra showed the appearance of two bands around 420 and 550 nm.The disruption of conjugation due to the presence of two calix hydrogens was reflected in the blue shifted absorption peaks. The dibenzothiophene embedded heteroporphyrins also displayed non aromatic and highly symmetric character. The absorption spectrum displayed a sharp soret band around 420 nm and a broad band ranging from 550-650 nm. The variation of heteroatoms in the macrocycle core altered the electronic properties of the dibenzothiophene embedded heteroporphyrins. The dibenzothiophene embedded hexaphyrins presented a chair like conformation as visualised from its X-ray crystal structure.In this case also two bands were observed for absorption spectrum, a more intense band being around 380 nm and a broad band extending from 500 to 800 nm further highlighting its non aromatic nature which is in agreement with its proton NMR resonances .

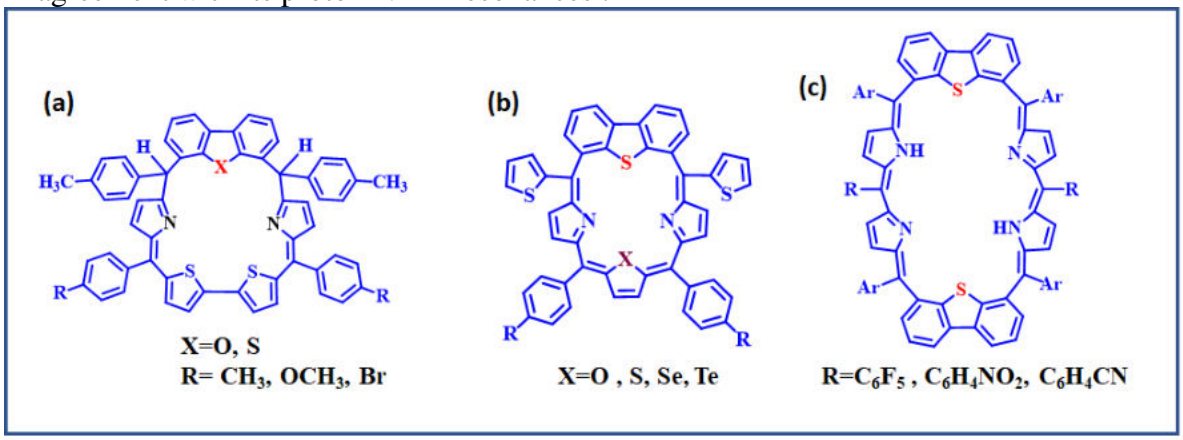

Figure 1. Dibenzothiphene/ furan embedded porphyrinoids (A)DBT/ DBF embedded bis- dithiacalixsapphyrin (B) DBT embedded heteroporphyrins (c) DBT embedded hexaphyrins

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FLASH PRESENTATION (FL -17)

PROTONATION INDUCED PLANARIZATION OF CORE-MODIFIED [48]DODECAPHYRIN(1.0.1.0.1.0.1.0.1.0.1.0)

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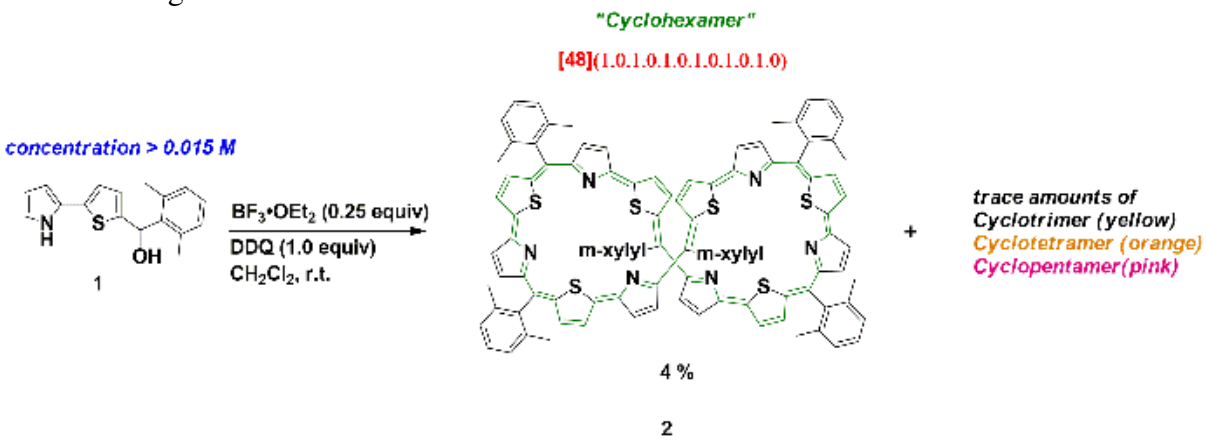
ABSTRACT

Expanded porphyrins are well known for their unique electronic and optical properties.[1] They are extensively employed in various fields such as anion binding agents, non-linear optical(NLO) materials, MRI contrast agents and to study Huckel-Mobius aromatic switch.[2] Among the expanded porphyrinoids, dodecaphyrins consisting of 12 heterocycles connected by varying number of *meso* carbons are known for their synthesis, electronic properties and structure property correlation. In this presentation we describe the synthesis, electronic and optical properties of [48] dodecaphyrin (1.0.1.0.1.0.1.0.1.0.1.0) bearing alternate diheterole units, synthesized through Lewis acid catalysed condensation reactions of the key precursor **1**.[3] Single crystal X-ray structure revealed a doubly twisted "figure of eight" conformation of **2**. On protonation in presence of methane sulphonic acid (MSA), compound **2** undergoes significant changes in the UV-Vis-NIR spectra let out the formation of its aromatic congener.[4]



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FLASH PRESENTATION (FL -18)

DESIGN, SYNTHESIS AND CHARACTERIZATION OF MOLECULAR COMPONENTS FOR LIGHT INDUCED MOLECULAR MACHINES

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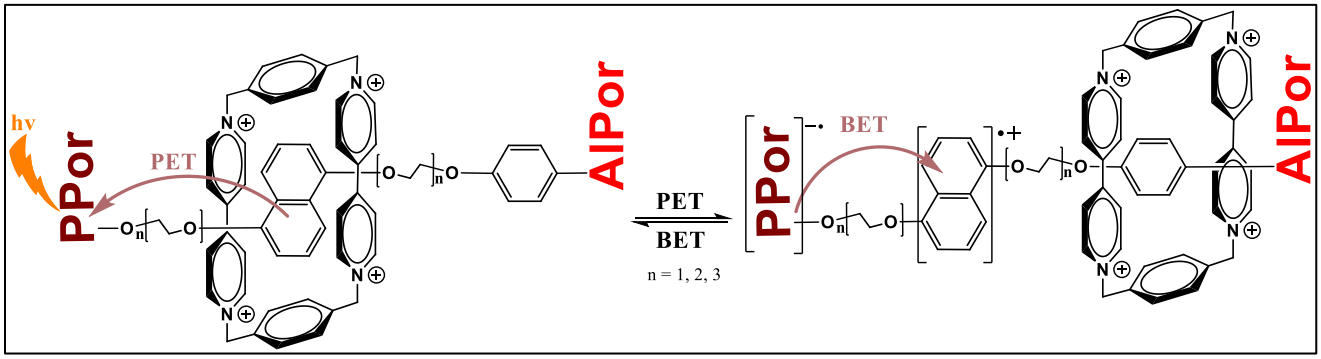
Various porphyrin derivatives were synthesized and characterized. The assessment of these materials for use in molecular machines is presented here in this presentation.

1. Introduction

Molecular machines are systems of molecules that convert chemical energy into mechanical forces. They have a range of potential applications such as transportation of chemicals or use as an arity signal for computation. In literature, most molecular machines are activated through some form of chemical signal. This has a range of drawbacks from limiting the range of environments the machine can function in to the buildup of byproducts of the chemical reaction. The solution to these limitations was found in the synthesis and characterization of various light induced molecular machines. Like the name implies, this subset of molecular machines uses light as the signal that activates the mechanism. The model of molecular machine being worked on in this research is a porphyrin-based molecular shuttle shown in the below scheme.



Upon photoexcitation of the porphyrin acceptor, represented by the symbol A, an electron transfer from naphthyl group to the porphyrin occurs. Following this photoinduced electron transfer, a radical pair is formed between the porphyrin and naphthyl group. The newly generated naphthyl cation is expected to drive the macrocycle situated around the naphthalene towards the aryl group due to the more favourable interactions. Upon relaxation of the radical pair through back electron transfer, the macrocycle is expected to return to the naphthalene group due to the regeneration of the electron density on the naphthyl group. In this context, novel molecular machine components have been synthesized and characterized using various spectroscopic and electrochemical techniques. The goal of which, is to fine tune the chemical, physical and synthetical properties such that they are suitable for future use in a complete molecular machine as described in the above scheme.

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FLASH PRESENTATION (FL -19)

Phenothiazine tethered porphyrin analogous as a hole transporting material for printable perovskite solar cells

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In this poster, we present the synthesis of a series of phenothiazine tethered porphyrin-based hole transporting materials (HTMs) coded as HPPHT, ZPPHT, CPPHT and their structural, electrochemical and device studies.

1. Introduction

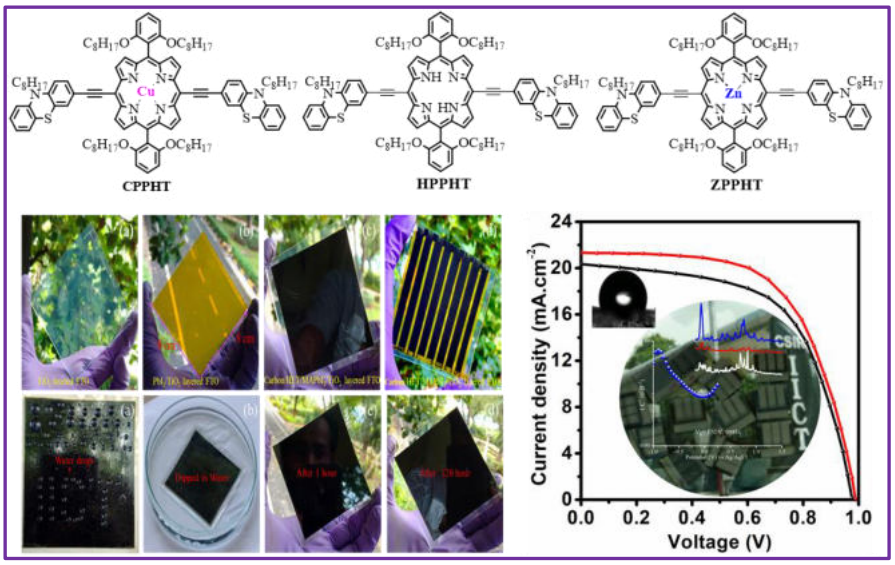
Porphyrins are tetrapyrrolic 18π-conjugated aromatic macrocycle systems have been exploited in many applications including solar cells, biological, catalysis etc[1]. Recently porphyrins introduced into perovskite solar cells either used as a hole transporting layers or defect passivation. In recent times, new types of porphyrin macrocycles achieved PCE of 20% in perovskite solar cells with good stability[1-2]. From the recent literature survey, we come to know that there is room for development of new porphyrin based HTMs for efficient and durable perovskite solar cells[1]. We recently reported phenothiazine tethered porphyrin-based hole transporting materials for perovskite solar cells[3]. In this poster, we describe the synthesis of these novel HTMs with their structural, spectral electrochemical and device properties will be discussed.

2. Experimental Section

The critical intermediate 5,15-dibromo-10,20-bis(2,6-dioctoxyphenyl)porphyrin (H_2Por-Br_2), was prepared as per our previous work[3]. Free-base H_2Por-Br_2, $Pd(dba)_3$ and $AsPh_3$ catalysts were dissolved in a dry tetrahydrofuran (THF) and triethylamine (TEA) under N_2 atmosphere. Then of 3-ethyl-10-octyl-10H-phenothiazine (C_8-Ptz-E) was slowly added to the resulting mixture. After consumption of more than starting material, the reaction mixture purified methanol recrystallization for **HPPHT** in 85% yield as a green powder. Similarly, HPPHT was dissolved in chloroform containing copper acetate/zinc acetate. The resultant mixture was refluxed for four hours then purified and recrystallized from methanol to obtain **CPPHT/ZPPHT** in 90% yield each as a green powder[4]. All the compounds were characterized and fabricated with the view of hole transporting materials for perovskite solar cells.

3. Results and Discussion.

The donor-phenothiazine was coupled at two *meso*- positions of the porphyrin ring via Sonogashira coupling, gives free-base porphyrin HTM (**HPPHT**) followed by Zn & Cu metalation with respective metal salts to obtain **ZPPHT** and **CPPHT** respectively. These materials were shown excellent thermal stability (T_d~450 ºC), wide range of absorption wavelengths (700-750 nm) and excellent HOMO-LUMO energy levels which are well aligned to the perovskite ($MAPbI_3$)[3-4]. **CPPHT** showed a higher conductivity (0.87 X 10^{-5} S cm^{-1}) than the **HPPHT** (0.67 X 10^{-5} S cm^{-1}) or **ZPPHT** (0.73 X 10^{-5} S cm^{-1}. Finally, we fabricated HTM devices with configuration:(FTO/TiO_2/$MAPbI_3$/**HTM**/CGC). With excellent morphology these devices achieved nearly **13%** of power conversion efficiency[4]. Greater hydrophobic nature of these porphyrin based HTMs protect the perovskite and improves the device stability at ambient conditions.



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FLASH PRESENTATION (FL -20)

SYNTHESIS, STRUCTURE AND ANION BINDING STUDIES OF N-CONFUSED-LIKE PORPHYRINOINDS EMBEDDED WITH CARBAZOLE SUBUNIT

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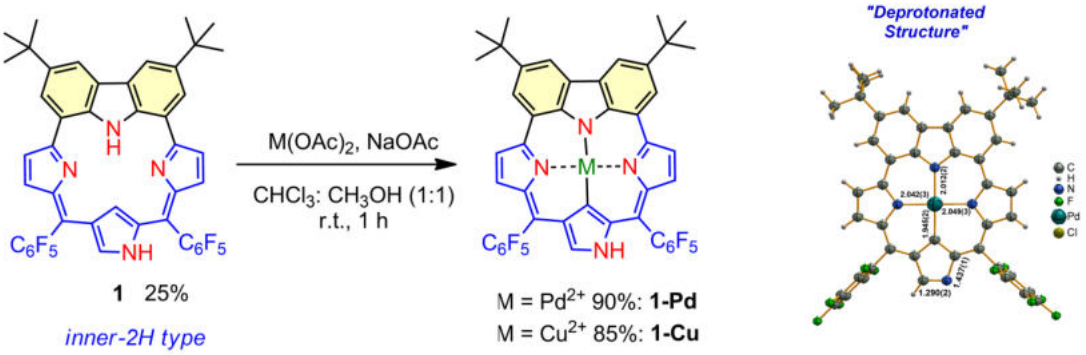
ABSTRACT

Here we report a new class of carbazole based macrocycles bearing inverted pyrrole ring (N-confused porphyrin). [1] We have successfully synthesized free base (NCP) and their metal complexes (NCP-Cu and NCP-Pd) and have characterized using standard spectroscopy techniques. These macrocycles act as a highly sensitive and selective sensor to detect toxic anions such as F^- and CN^-.[2] The sensing property is attributed to the highly acidic nature of NH moiety and more basic nature anions and size of anions which result in *vivid* color change and ratiometric enhancement of near-IR fluorescence and quenching at 746 and 618 nm respectively.[3] Crystal structure analysis confirms the role of deprotonation in the sensing. Further theoretical techniques are also employed to study the magnetic and excited state properties of the macrocycles.



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FLASH PRESENTATION (FL -21)
3,6,13,16-TETRAPROPYLPORPHYCENE: POSITIONAL EFFECT OF PROPYL GROUP TOWARDS DESIGN AND CONTROL OF STRUCTURAL AND PHOTOPHYSICAL PROPERTIES

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The poster gives an outline on synthesis and change in photophysical properties of **outer TPrPc** and **inner TPrPc**, the two β-tetrapropylporphycene positional isomers.

1. Introduction

The synthesis of porphycene, first reported by Vogel in 1986, introduced a new area of research, devoted to constitutional isomers of porphyrin.[1] It's a conjugated tetrapyrrolic aromatic macrocycle, where 18π-electrons are in conjugation. Its unique intense absorption in the red region compared to porphyrin, makes it one among the best choice of photosensitizer for photodynamic therapy (PDT). In addition, the effect of substituents is found to be more pronounced in porphycenes due to the presence of two bipyrrolic units. In order to enhance the solubility and crystallinity of porphycene, Vogel and coworkers prepared various derivatives bearing substituents in the 2,7,12,17- positions such as **outer TPrPc**.[2] But these porphycenes were found difficult to complex with metal ions, particularly with Zn(II) yet to be reported. In 1987, Vogel proposed that presence of substituents at 3,6,13,16-positions due to considerable non-bonding interactions between them, reduce NH…N hydrogen bonding and make the porphycene more square type ligand to facilitate complexation. The synthetic challenges behind the molecule lead a tough target to the chemist and it's not reported even after three decades. This motivated us to synthesize this molecule to explore their chemistry. Herein, we report the successful synthesis of 3,6,13,16-tetraalkylporphycene as its tetrapropyl analogue (**inner TPrPc)** and demonstrated its complexation ability with Zn(II) ion. A comparison with the already reported 2,7,12,17-isomer (**outer TPrPc**) revealed the importance of this mode of substitution in porphycene with respect to the structure, coordination ability and photophysical properties.[2]

2. Experimental Section

The key component to synthesize **inner TPrPc**, is diethyl 3,3′-dipropyl-1H,1′H-[2,2′-bipyrrole]-5,5′-dicarboxylate. The desired bipyrrole was developed by oxidative coupling method using PIFA and $BF_3.OEt_2$.[3] Followed by base mediated deprotection of the ester yielded the desired bipyrrole and subsequent Vilsmeier formylation of this bipyrrole resulted in the formation of bipyrrole dialdehyde. Finally, McMurry coupling of the dialdehyde using low valent Ti generated from $Zn/TiCl_4$, in presence of CuCl followed by aerial oxidation provided the desired 3,6,13,16-tetrapropylporphycene as blue solid in 21% yield. The **inner TPrPc** was further converted to its corresponding Zn(II), Ni(II) and Pd(II) complexes. Further analysis of these metal complexes is under progress.

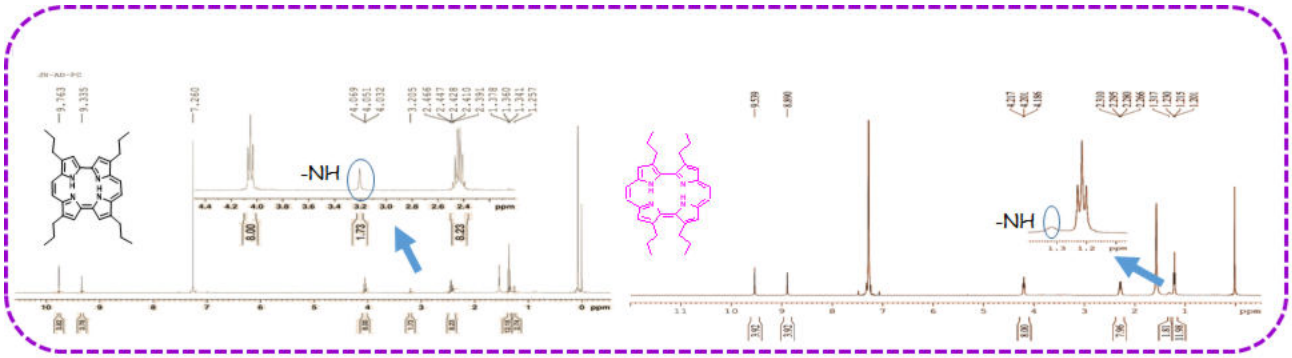

Figure 1: ^{1}H NMR spectrum of **outer TPrPc**[2] and **inner TPrPc**.

3. Results and Discussion

We have demonstrated, PIFA and $BF_3.OEt_2$ mediated coupling of ethyl 4-propyl-1H-pyrrole-2-carboxylate to corresponding bipyrrole enabled us to synthesize 3,6,13,16-tetrapropylporphycene for the first time after three decades. Interestingly, due to weak intramolecular core NH…N hydrogen bonding in **inner TPrPc**, the NH protons (**1.31 ppm**) were highly shielded than the reported **outer TPrPc (3.04 ppm)** as shown in **Figure 1**. The new 3,6,13,16-tetrapropylporphycene was structurally characterized in solid state by single crystal X-ray diffraction analysis and the porphycene was found to be planar (**Figure 2a**). Further, we have studies positional effects of substituents between two isomers, with respect to their structure and photophysical properties.

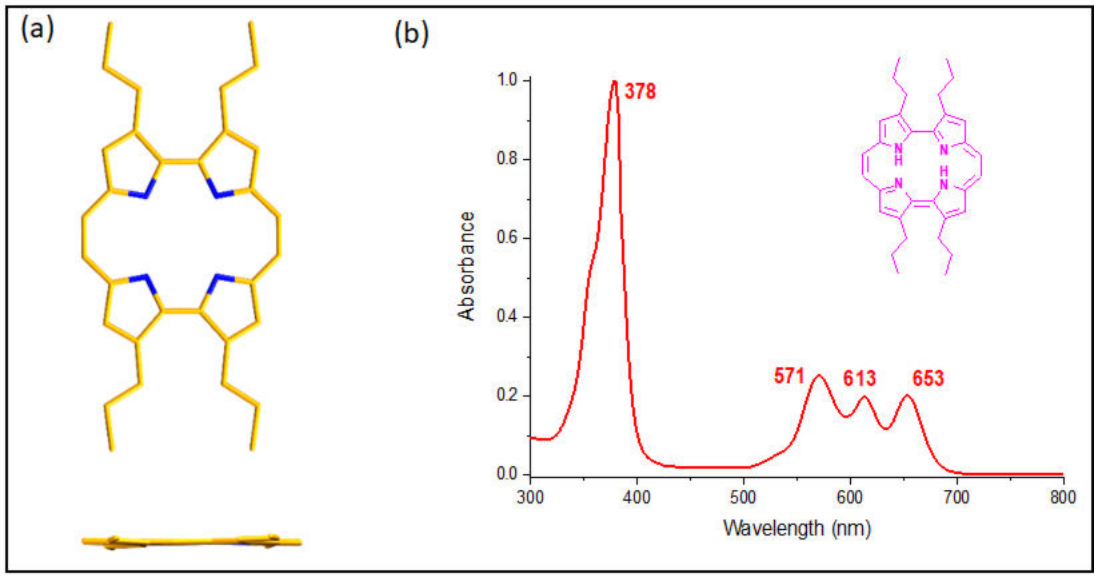

Figure 2: (a) X-ray crystal structure (Top view and side view) and (b) absorption spectrum of inner TPrPc.

4. References

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FLASH PRESENTATION (FL -22)

Corroles in Electrocatalytic Proton Reduction

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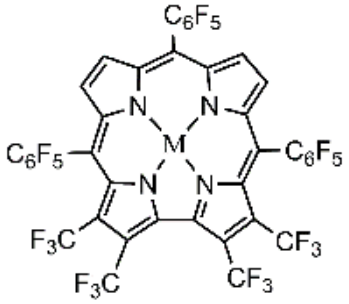
ABSTRACT

Corroles are good catalysts for activating small molecules/ions like H^+, O_2, H_2O via electrolysis,[1] during which the catalyst undergoes various redox processes. The most commonly used efficient catalyst with cobalt(III) chelation for corroles, consists of a 6-coordinate and 5-coordinate with axial ligands are pyridines and triphenylphosphine.[2] However, 4-coordinated cobalt corroles are believed to be more flexible to bind on axial position of macrocycle by the Hydride ion to perform catalytic Hydrogen reduction on Pt surface.[3] We have recently introduced a new synthetic protocol for selective functionalization: *in-situ* iodination and metalation of Cobalt, Copper, Gold.[4] Metallo corroles (Co(III), Cu(III), Gold(III)) with b-iodo and b-CF_3 substitution, which were fully characterized in terms of structural, electronic structure, photophysical properties and electrochemical processes. Our deduction of how the CF_3 groups and the axial ligands affect both the redox potentials and their reversibility is essential for the design of optimal catalysts for two of the most important catalytic processes for clean energy: the conversion of protons to molecular hydrogen (H_2).



(tpfc)M
M = Transitional metals

References

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FLASH PRESENTATION (FL -23)

SYNTHESIS, STRUCTURE AND ELECTRONIC PROPERTIES OF *P*-PHENYLENE EMBEDDED CYCLOTRIMER AND CYCLOTETRAMER

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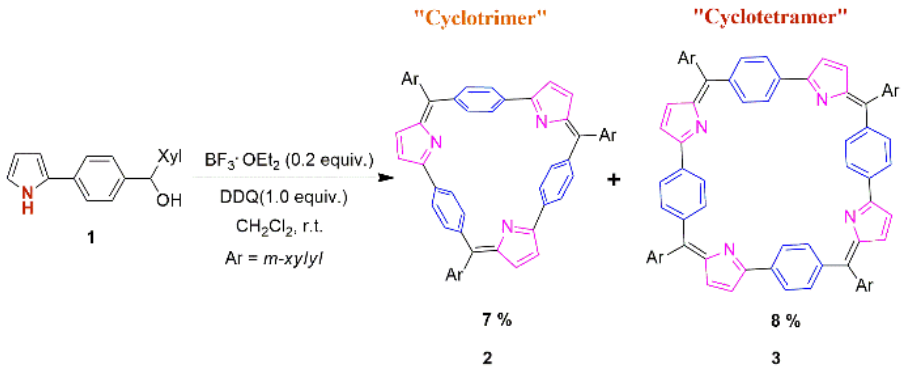
ABSTARCT

Over the past few decades, core modification of the porphyrin ring had gained immense interest due to their unique opto-electronic properties. A class of molecules called "Carbaporphyrinoids", where the inner nitrogen atoms are replaced by C-H units, turned out to be a revolution in the field of porphyrinoid chemistry. They had received global attention due to their unusual reactivity and ability to form metal-carbon bonds under mild conditions.[1] Among them, *p*-phenylene incorporated expanded systems are less explored in literature in terms of their structure-electronic properties.[2] In this presentation, we describe the synthesis, structure and electronic properties of 1,4-phenylene linked Cyclotrimer **2** and Cyclotetramer **3** using a newly designed key precursor **1**.[3] Various spectral features suggest that compound **2** and **3** are nonaromatic with a porphyrinic character. [4]



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FLASH PRESENTATION (FL -24)

EFFECT OF STRUCTURAL TUNING TO ENCHANCE THE NONLINEAR OPTICAL RESPONSE OF SALEN TYPE Ni(II) COMPOUNDS

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We have synthesize and investigate the imaginary third order NLO activity, optical limiting capability and first hyperpolarizabilities of five Ni(II) salen complexes using experimental and theoretical methods. The complexes are tuned to have different NLO response by changing mainly the diimine spacer group. The order of activity is a direct function of the degree of π-delocalization and all the tested compounds returned outstanding optical limiting capabilities making them excellent materials for fabrication of such devices.

1. Introduction

Synthesis and design of nonlinear optical active materials is an active area of research in modern chemistry it is because of its multifaceted application in various field which includes data storage, optical computing and image processing etc[1]. From the early time itself different organic molecules and polymers were reported as NLO active materials later on inorganic chemists explored this field especially in metal complexes.

Designing of a material to possess good second order or third order NLO response is a crucial task which includes the preparation of a molecule having high β value and to modify the material in order to possess a high χ^2 value. Inorganic compounds even though less used, have great potential in this field over the organic ligands since the complexation process may lead to the formation of geometrically constrained planar structure which enhances the optical nonlinearity[2]. In this scenario where researchers are in search of materials having optoelectronic application, our compounds are significant since they show high value of third order susceptibilities ($\chi^{(3)}$) which is in the semiconductor range (10^{-13}-10^{-10} esu).

2. Experimental Section

We have synthesized five different nickel complexes using bi compartmental salen Schiff base ligands *via* [2+1] condensation reaction. All the complexes reported are synthesized by adopting one pot method. The aldehyde and diamines were mixed in the 1:2 molar ratios for about 1 hour in a mixture of solvents (v/v ; Acetonitrile : DMF). Once the ligand formation was confirmed, The metal salt was added to the same reaction mixture in 1:1 ratio for complexation.

In order to study the nonlinear optical behaviour and also the effect of substituent in their nonlinear behaviour third order NLO properties of these compounds were studied using open aperture *Z*-scan

technique. The experimental results were substantiated with frontier orbital calculations carried out using DFT at B3LYP/6-31G* level of theory.

3. Results and Discussion

In this work, we report five Ni(II) salen complexes with excellent non-linear activity of the order of polymers and semiconductors. Third order nonlinear optical (NLO) activity of the complexes were probed using laser pulses of wavelength 532 nm by employing open aperture Z-scan technique. Compound **1** belonging to the salphen family (*o*-phenylene diimine spacer group) exhibited the highest activity then followed by **2** which has an ethylene diimine spacer group. It can be seen that both the compounds exhibit high degree of π-delocalization when compared to the others and this is critical for the enhancement of NLO response. Moreover, on performing optical limiting experiments all the complexes displayed high absorption (low transmittance) of higher intensity input light with output intensities falling beyond 3.36×10^{-11} W/m^2 (lowest). Further frontier orbital calculations and visualization reveal that in all the complexes the donor group is the methoxy moiety and the acceptor is mainly concentrated on the metal centre. The computed values of first hyperpolarizability (β^{hyp}) carried out at B3LYP/6-31G* level of theory agree well with the trend of the experimentally obtained values of two photon absorption coefficient (β) (table 1). The high value of first order hyperpolarizability and two photon absorption coefficients along with good optical limiting capabilities make these complexes as a perfect prospect for the development of NLO devices.

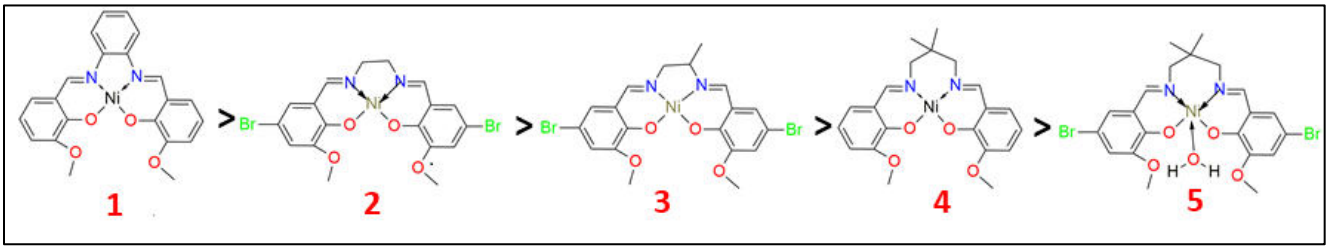

Figure 1. The order of third order non-linear optical response of synthesized bicompartmental Salen type Ni(II) compounds.

Table 1. Calculated values of linear transmittance, two photon absorption coefficients (**β**) and imaginary part of third order susceptibility (**Im $\chi^{(3)}$**) of compounds (**1** to **5**) at 532 nm

Compounds	Linear transmittance	Two photon absorption coefficient (β) (10^{-10} m/W)	Two photon cross section (σ) (GM)	Im $\chi^{(3)}$ (10^{-11} esu)
1	0.7988	9.58	5606	3.1472
2	0.81302	5.19	3037	1.7050
3	0.7865	4.40	2575	1.4455
6	0.7648	3.90	1374	1.2812
5	0.7529	2.74	1609	0.9001

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FLASH PRESENTATION (FL -25)

ADSORPTION OF METHYLENE BLUE ON SILICA SYNTHESIZED FROM DIFFERENT SOURCES

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In this poster, we present the synthesis of silica from agrowaste and their adsorption studies on methylene blue using UV-Visible Spectroscopy.

1. Introduction

Methylene Blue is an aromatic, heterocyclic, potent cationic dye used in textile industries for dying cotton, silk and wool. Almost 15% of such dyes used for dying process are lost and released as waste water. Methylene blue, a thiazine dye can causes health problems to humans and harmful to the aquatic resources. Due to the nonbiodegradable nature of such dyes, adsorbents synthesized through green mechanism will be an effective technique to remove such colored organics before its transformation. Bamboo leaves and wood are potential agro waste, that able to produce silicon dioxide or silica. In this poster we describe the synthesis of silica obtained from bamboo shoots used as an adsorbent to remove methylene blue and adsorption studies are done by using Ultraviolet-Visible spectroscopy.

2. Experimental Section

Bamboo shoots were cleaned thoroughly with distilled water and subjected to moisture removal sintered at 873K for 4 hrs. The sintered sample was treated with 1M NaOH to form sodium silicate and treated with 6M H_2SO_4 to precipitate silica. About $3x10^{-5}$ molar solution of adsorbate (methylene blue) is prepared by dissolving 0.0224 g of methylene blue in 2L using distilled water. Also mesoporous silica was synthesized according to the procedure (modified by Stauber method) described by HaixiaWaxy, Pascal Van Der Voort et *al.* About 150 ml of $3x10^{-5}$ molar methylene blue solution is taken in 250 ml conical flask. 0.3 g of each of the finely powdered silica samples were added and shaked uniformly using a shaker. At each interval a definite amount (10 ml) of the sample is withdrawn and filtered and absorbance at definite intervals is measured using a UV-Visible spectrophotometer. The initial absorbance of the methylene blue solution is also measured.

3. Results and Discussion

From the absorbance values, the % of adsorption of silica obtained from bamboo shoots and meso silica at definite time intervals is calculated. Silica obtained from bamboo shoots shows maximum % of adsorption at first 10 minutes and the meso silica also shows maximum % of adsorption at first 10 minutes. Meso silica shows 75% adsorption and Bamboo silica shows 21% adsorption within 10 minutes. At definite intervals of time, the % of adsorption decreases. This decrease of % of adsorption confirms the phenomenon desorption**,** due to large pore size of silica obtained from bamboo shoots. The method preparation of silica from bamboo shoots is very simple as no further modification is done. Both the silica samples can be effectively used as an adsorbent for the removal of methylene blue.

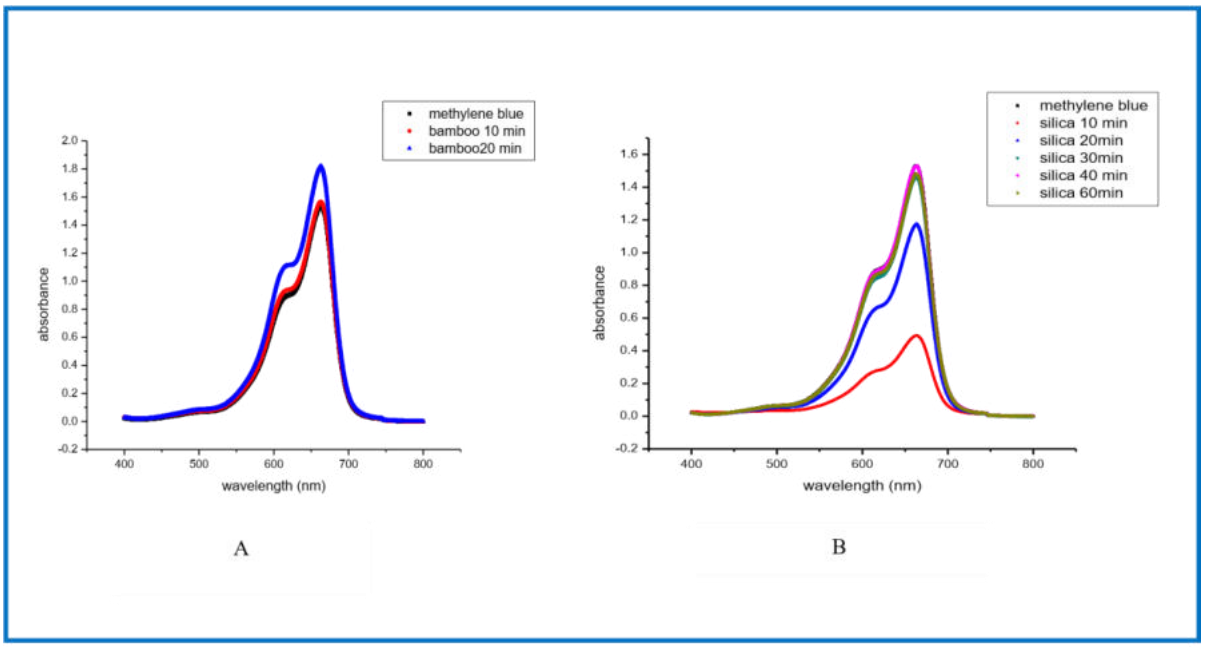

Figure 1: UV-Visible Spectrum of (A) Bamboo Shoot Silica (B) Meso Silica

4. References

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FLASH PRESENTATION (FL -26)

COVID-19: Attacks the 1-Beta Chain of Haemoglobin and Captures the Porphyrin to Inhibit Human Heme Metabolism

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In this poster, we present the How COVID-19: Attacks the 1-Beta Chain of Hemoglobin and Captures the Porphyrin to Inhibit Human Heme Metabolism.

1. Introduction

The novel coronavirus pneumonia (COVID-19) is an infectious acute respiratory caused by the novel coronavirus. The virus is the positive-strand RNA one with high homology to bat coronavirus. The pathogenic mechanism of the new coronavirus is still unclear, which is a significant obstacle to the development of drugs and patients' rescue. In this study, conserved domain analysis, homology modeling, and molecular docking were made to compare the biological roles of specific proteins belonging to the novel coronavirus. The conserved domain analysis showed envelope protein (E), nucleocapsid phosphoprotein (N) and ORF3a had heme linked sites, which Arg134 of ORF3a, Cys44 of E, Ile304 of N were the heme-iron linked site, respectively. ORF3a also possessed the conserved domains of human cytochrome C reductases and bacterial EFeB protein. These three domains were highly overlapping so that ORF3a could dissociate the iron of heme to form porphyrin. Heme linked sites of E protein may be relevant to the high infectivity, and the role of heme linked sites of N protein may be related to the virus replication. The docking results showed that orf1ab, ORF10, and ORF3a proteins coordinated to attack the 1-beta chain of hemoglobin, and some structural and non-structural viral proteins could bind porphyrin. Deoxyhemoglobin was more vulnerable to virus attacks than oxidized hemoglobin. But ORF3a was specific and would not attack blue blood protein, normal cytochrome C, and peroxidase. As for the attack, it would cause increasingly less hemoglobin that could carry oxygen and carbon dioxide, thus producing symptoms of respiratory distress and coagulation reaction, damaging many organs and tissues.

The mechanism also interfered with the normal heme anabolic pathway of the human body, expecting to cause human diseases. Based on the small molecule drug library, drugbank, we searched for drugs bound to viral proteins by molecular docking. The results showed that some anticancer drugs could attach to the heme-iron linked site of ORF3a and N.Remdesivir was relatively more obvious than Hydroxychloroquine and Chloroquine in terms of the binding capacity of ORF3a, but the combined role of three drugs to ORF3a was lower. Unfortunately, no drug could bind to the heme-iron linked site of E. Besides, these higher binding energies may prevent all screened drugs from binding firmly to viral proteins. Since there were no clinical data, so inhibitory effects on ORF3a and N were still unclear. This theory is only for academic discussion and needed to be verified by other experiments. Please consult a qualified doctor for treatment details. Due to the toxicity and side effects of drugs, do not use

medicines yourself. We expect these discoveries to bring more ideas to people to relieve patients' symptoms and save more lives.

2. Conclusion

Since the emergency epidemic, it is of high scientific significance to use bioinformatics to analyze the roles of novel coronavirus proteins (such as ORF8 and surface glycoproteins). In this study, domain prediction methods were applied to search for conserved domains. The structure of protein molecules such as ORF8 and surface glycoproteins were obtained using homology modeling methods. Molecular docking technology was used to analyze the binding part of viral proteins to the heme and the porphyrin. The study results show that ORF8 and surface glycoproteins could combine to the porphyrin to form a complex, respectively. At the same time, orf1ab, ORF10, and ORF3a proteins could coordinate attack the heme on the 1-beta chain of hemoglobin to dissociate the iron to form the porphyrin. The attack will lead to less hemoglobin to carry oxygen and carbon dioxide. The lung cells have extremely intense inflammation due to the inability to exchange carbon dioxide and oxygen frequently, which eventually results in ground-glass-like lung images. Patients with respiratory distress will be made worse. Diabetic patients and older people have higher glycated hemoglobin. Glycated hemoglobin was reduced by the attack, which made patients' blood sugar unstable. Since the porphyrin complexes of the virus produced in the human body inhibited the heme anabolic pathway, they caused a wide range of infection and disease. With these findings in mind, further analysis revealed that chloroquine could prevent orf1ab, ORF3a, and ORF10 from attacking the heme to form the porphyrin, and inhibit the binding of ORF8 and surface glycoproteins to porphyrins to a certain extent, effectively relieve the symptoms of respiratory distress. Since the ability of chloroquine to inhibit structural proteins is not particularly obvious, the therapeutic effect on different people may be different. Favipiravir could inhibit the envelope protein and ORF7a protein bind to porphyrin, prevent the virus from entering host cells, and catching free porphyrins. Due to the side effects and allergic reactions of drugs such as chloroquine, please consult a qualified doctor for treatment details, and do not take the medicine yourself. Depending on the computational simulation and discussion analysis of this study, we speculated the main pathogenic mechanism of this virus. The virus may first infected cells with ACE2 receptors, including immune cells. Immune cells produced antibodies and viral proteins. Antibodies and red blood cells generated immune hemolysis. Hemoglobin was infected and then attacked. The virus captured porphyrin and inhibited heme metabolism. Therefore, we believe that the damage of the virus to the human body is systemic, not confined to the respiratory system.

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FLASH PRESENTATION (FL -27)

Catalytically active coordination polymer with a tiny Zn_2Se_2 ring bridged by bis-selone

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In this poster, we present unprecedented architecture of a one-dimensional coordination polymer with a tiny Zn_2Se_2 ring system incorporated in the hydrogen-bonded array has been prepared, where the di-selone ligand functions as a unique neutral bridging ligand. The coordination polymer shows excellent catalytic activity in substituted 8-hydroxy-2-quinolinyl synthesis through Knoevenagel condensation reaction.

1. Introduction

Imidazoline selones have been considered as a neutral s donor ligand that can be an ideal choice to replace the N-heterocyclic carbene (NHC) type ligands in catalysis. To date, many metal complexes bearing imidazole selone ligands have been prepared to understand the potential role in catalysis. Since imidazole-2-selones can donate up to six electrons with multiple coordination modes, various coordination patterns have been observed. Similar such new coordination modes of a multidentate ligand can bring a new strategy to construct novel coordination polymers. Like NHC, imidazole selone ligated metal clusters or polynuclear assemblies are rare due to the steric influence of a N-substituent at imidazole-2-selone. Among transition metal derivatives of imidazole-2-selone, the catalytic application of Zn(II)-imidazole selone is lest studied due to the formation of insoluble ill-defined material. The isolation of structurally characterized coordination polymers of Zn(II)-imidazole selone is the most challenging task. In general, the zinc(II) coordination polymers have demonstrated to their potential applications in catalysis, electrochemistry as conducting materials and optoelectronics.8 However, only one structural investigation on bis-azole thione bridged zinc(II) coordination polymer has been reported. We report the reaction between $ZnBr_2$ and [(3,30-ethane)bis(1-isopropyl-benzimidazole-2-selenone)] (L), which give rise to a catalytically active 1D coordination polymer $[(L)\{ZnBr_2\}_2]_n$ (1). The coordination polymer **1** depicts a new architecture generated by an unusual Zn_2Se_2 ring bridged through the bis benzimidazole selone ligand

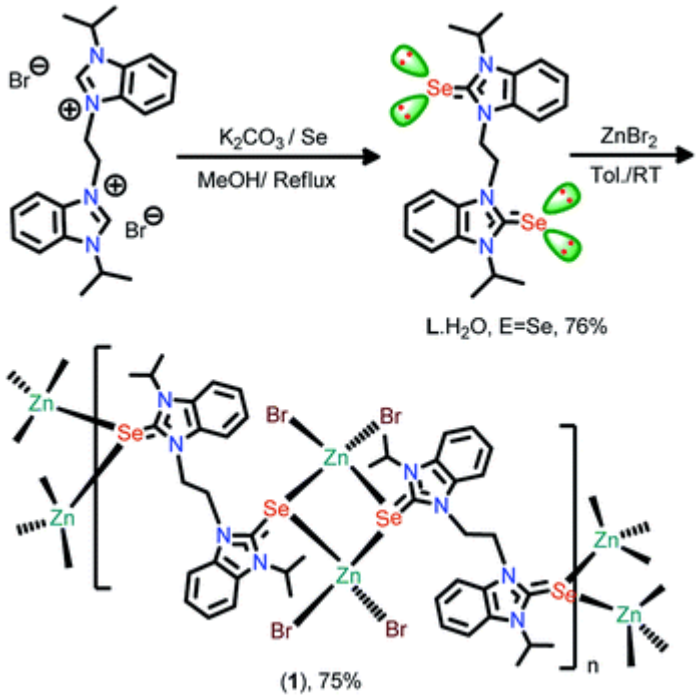
2. Experimental Section

To a mixture of potassium carbonate, 1,1'-(ethane-1,2-diyl)bis(3-isopropyl-1H-benzo[d]imidazol-3-ium) bromide and Se powder were added under argon atmosphere then methanol (20 mL) was added to the reaction mixture. The reaction mixture was refluxed for 24 h at 70 ^oC. The progress of the reaction was monitored by TLC. After completion of the reaction, the solvent was removed using rotary evaporator under reduced pressure followed by water was added to the solid and extracted with dichloromethane (3 ×15 mL). The organic extract was washed with brine solution, and dried over anhydrous Na_2SO_4. To a stirred solution of $ZnBr_2$ in toluene, **L** was added under argon atmosphere at ambient temperature. Subsequently the reaction mixture was stirred at room temperature for 3 days to yield the off white precipitate. The solvent was removed then the solid residue was washed with hexane

(2 x 5 mL) and dried under high vacuum. The resulting solid was dissolved in acetonitrile and methanol mixture (1:1 ratio) to obtain colorless crystals of **1** at room temperature.

3. Results and Discussion

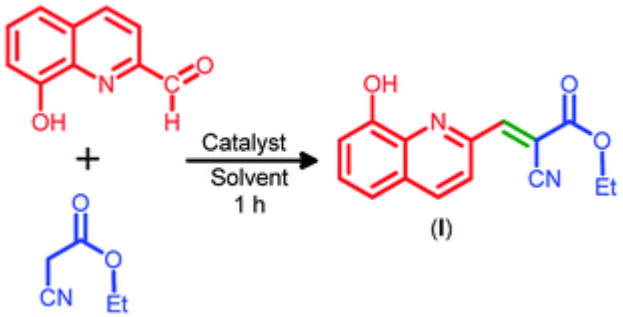
The selone ligand **L**.H_2O was isolated with excellent yield from the reaction between 1,10-(ethane)bis(3-isopropylbenzimidazolium) bromide salt with selenium powder in the presence of K_2CO_3 (Scheme 2). **L**.H_2O is entirely soluble in MeOH, DCM, $CHCl_3$, and DMSO, while partially soluble in ethyl acetate and insoluble in hexane. The FT-IR spectrum of **L**.H_2O exhibits an intense C=Se stretching frequency at 1164 cm^{-1}. In ^{13}C NMR, the carbon attached with selenium (C=Se) appears at 165 ppm. The solid-state structure of **L**.H_2O was further confirmed by single-crystal X-ray diffraction technique. The crystallographic data are provided in Table 1. The chalcogenone ligands **L**.H_2O crystallized in monoclinic, space group P21/c. The C=Se bond lengths of **L**.H_2O is 1.820(74) A. The N–C–N bond angle of **L**.H_2O indicates the existence of sp2 hybridization. The new coordination polymer **1** was synthesized with excellent yield from the reaction between zinc bromide, and **L**.H_2O. **1** is partially soluble in MeOH, EtOH, and DMSO. The formation of 1 was confirmed by FT-IR, NMR (^1H and ^{13}C), UV-visible, and TGA techniques.



Scheme 1 Synthesis of **L**·H_2O and **1.**

The construction of this new coordination polymer with Zn2Se2 units prompted us to study the catalytic activity of 1 in the Knoevenagel condensation reactions (Scheme 3). Thus, the Knoevenagel condensation reaction between 8-hydroxyquinoline-2-carbaldehyde with ethyl-2-cyanoacetate has been

investigated using catalyst 1. 8-Hydroxy quinoline, and the corresponding derivative has great biological significance.



Scheme 2 Catalyst **1** mediated Knoevenagel condensation of 8-hydroxyquinoline-2-carbaldehyde with ethyl-2-cyanoacetate.

4. References

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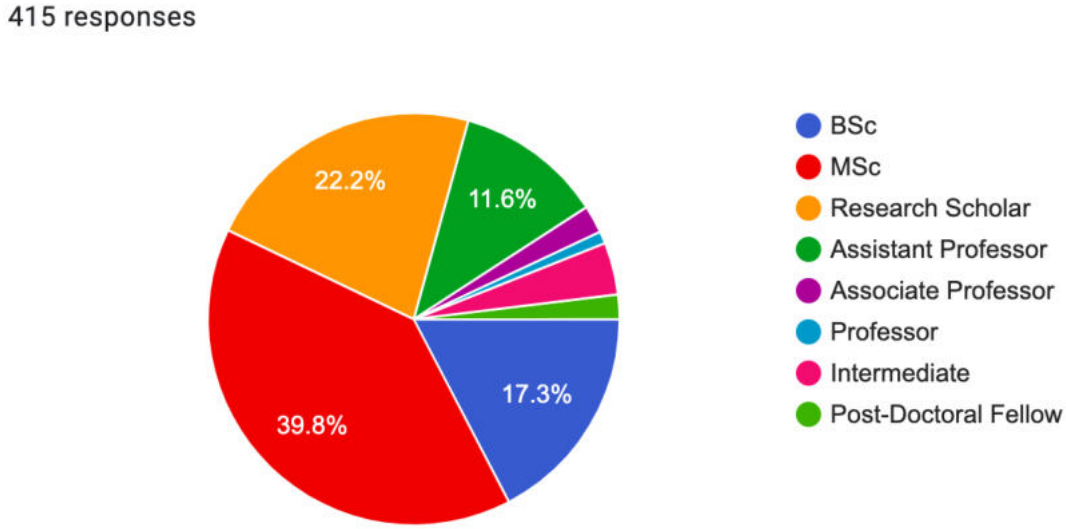
Statistics of Conference Participants



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8/26/2020 18:39:55	kalavala.vishnu@gmail.cc	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very good
8/26/2020 18:40:03	yogi1111997@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very much information
8/26/2020 18:40:04	souviksarkar711@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Nothing
8/26/2020 18:40:04	kulalshreya770@gmail.co	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Good session...informative
8/26/2020 18:40:18	dass70844@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It's really good season
8/26/2020 18:40:19	kavyaayvak1226@gmail.(	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was excellent
8/26/2020 18:40:33	rehash.ranjan@gmail.con	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent and very informative session
8/26/2020 18:40:34	sooryakeerthips@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	I think ZOOM is more comfortable app to conference
8/26/2020 18:40:36	umadeviag11@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Informative sessions
8/26/2020 18:40:38	sulthanak7@gmail.com	Excellent	Yes	Very good	Very Good	Excellent	Yes	Good
8/26/2020 18:40:46	wbgurnule@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Whole conference was excellent
8/26/2020 18:40:47	cnvdl1234@gmail.com	Excellent	Yes	Excellent	Excellent	Very good	Yes	Informative
8/26/2020 18:40:47	mishranigam982@gmail.(	Excellent	Yes	Excellent	Very Good	Excellent	Yes	Well done
8/26/2020 18:40:50	abhijithnareekamvally@gı	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very good conference
8/26/2020 18:40:56	ruthmariamipe@gmail.cor	Good	Yes	Excellent	Very Good	Very good	Yes	Should be organized every alternate year with more porphyrin chemists from around the world
8/26/2020 18:40:58	virupakshiprabhakarsku@	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very nice presentation
8/26/2020 18:41:00	shalinidyagala705@gmail	Excellent	Yes	Excellent	Excellent	Excellent	Yes	VERY PRODUCTIVE
8/26/2020 18:41:00	prachi.gupta@students.iis	Excellent	Yes	Excellent	Very Good	Very good	Yes	It was a very good effort... And I was really glad to see so many people working on this field
8/26/2020 18:41:14	vmrgpm@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very good & useful conference
8/26/2020 18:41:22	nandansarkar80@gmail.c	Excellent	Yes	Very good	Excellent	Excellent	Yes	Very beneficial for students... Thanks
8/26/2020 18:41:24	nivedita18sharma@gmail	Excellent	Yes	Very good	Very Good	Very good	Yes	Great conference
8/26/2020 18:41:27	kuntalkoley97@gmail.con	Excellent	Yes	Excellent	Excellent	Excellent	Yes	we want more conference
8/26/2020 18:41:32	chavda_jaydeepsinh@iitg	Excellent	Yes	Excellent	Excellent	Excellent	Yes	No Comments
8/26/2020 18:41:36	lathikak4716@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	The session was very much good for all of us
8/26/2020 18:41:38	sahoo.siprasucharita@gn	Excellent	Yes	Very good	Very Good	Very good	Yes	This should be continued.
8/26/2020 18:41:43	anu_19310006@iitgn.ac.i	Excellent	Yes	Excellent	Excellent	Excellent	Yes	it should conducted every year.
8/26/2020 18:41:47	sreyasi.talukdar@gmail.c	Excellent	Yes	Excellent	Very Good	Excellent	Yes	It was very interesting
8/26/2020 18:41:48	darsanaasnta7@gmail.co	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Well organized and very informative.
8/26/2020 18:41:50	shaziyanajmi801@gmail.(	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very useful and informative
8/26/2020 18:42:00	pspragatisharma219@gm	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was very well organized, intriguing and informative.
8/26/2020 18:42:10	anjithaprakash03@gmail.(	Good	Yes	Very good	Very Good	Excellent	Yes	Ni
8/26/2020 18:42:12	krishnapriyakuruveli99@g	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Nothing.it was very nice session
8/26/2020 18:42:23	mesaikat30@gmail.com	Excellent	Yes	Very good	Excellent	Very good	Yes	Will love to attend this kind of conferences in future.
8/26/2020 18:42:25	snikitha870@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Nothing
8/26/2020 18:42:27	pranavbnair13@gmail.cor	Good	Yes	Very good	Excellent	Very good	Yes	No
8/26/2020 18:42:36	aswani0797@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Really nice and informative
8/26/2020 18:42:37	vijeshnambisan@gmail.cc	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent one.....Informative
8/26/2020 18:42:38	cy16resch11005@iith.ac.i	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Please conduct alternatives years
8/26/2020 18:42:39	anand.saibabu@gmail.co	Excellent	Yes	Excellent	Very Good	Very good	Yes	Very informative
8/26/2020 18:42:40	aswathips010@gmail.con	Excellent	Yes	Very good	Very Good	Very good	Yes	Please do webinar again. Full day webinar is difficult to attend so please reduce the time.
8/26/2020 18:42:45	srinivasukatharu@gmail.c	Good	Yes	Very good	Very Good	Very good	Yes	This is a very good and knowledgeble conference
8/26/2020 18:42:47	lakshmikrishnaa98@gmai	Excellent	Yes	Very good	Very Good	Good	Yes	The conference was informative.
8/26/2020 18:42:54	dasireddypoojitha@gmail.	Excellent	Yes	Excellent	Very Good	Excellent	Yes	I really enjoyed sir. Very excellent conference sir. Thank you for conducting this valuable conference's sir
8/26/2020 18:42:55	aathiraedwin@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	A great platform to learn more about porphyrin chemistry. Exciting to see such great ideas from various experts in this field.
8/26/2020 18:42:59	bemmanuel@rguktrkv.ac.	Excellent	Yes	Excellent	Excellent	Excellent	Yes	No
8/26/2020 18:43:08	Sulfikarali16@iisertvm.ac	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was a nice experience to listen great people
8/26/2020 18:43:15	markose.joshy@students	Excellent	Yes	Very good	Excellent	Excellent	Yes	Informative, Excellent organisation, sufficient time for hearing presentations, great oppurtunity for learning the beautiful works from eminent porphyrin chemists accross India.
8/26/2020 18:43:20	anusreedevi2001@gmail.	Excellent	Yes	Excellent	Excellent	Very good	Yes	No comments
8/26/2020 18:43:28	delnamary58@gmail.com	Excellent	Yes	Very good	Very Good	Excellent	Yes	Very informative talks
8/26/2020 18:43:34	Zaajilijilu@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very good
8/26/2020 18:43:34	peehu199825@gmail.con	Excellent	Yes	Very good	Very Good	Very good	Yes	It was a wonderful and learning experience to be a part of this conference.
8/26/2020 18:43:41	yrnayakulu@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Appreciations only
8/26/2020 18:44:15	sreejithomkaram@gmail.(	Excellent	Yes	Excellent	Excellent	Excellent	Yes	This was my first experience with virtual conference and I guess in so many ways it is better than a normal conference. Apart from the excellent invited talks, what really excited me was
8/26/2020 18:44:25	sanatsanjuktamahapatra(	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It is such a beautiful awasome virtual conference.I am personally didn't know much about this field and the super people attached with this.Really very helpful for me.Also the interaction
8/26/2020 18:44:27	somansmail@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Its really an excellent opportunity for those who learn the porphyrin chemistry.
8/26/2020 18:44:27	akshayae29@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	quality of presentations is excellent
8/26/2020 18:44:28	berryachu75@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	No
8/26/2020 18:44:38	annmaryantof20@gmail.c	Excellent	Yes	Very good	Excellent	Very good	Yes	Feeling so lucky to be a part of such a kind of informative Webinar
8/26/2020 18:44:56	aparnakgireesh380@gma	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Provide more webinars
8/26/2020 18:44:57	meghnaanil98@gmail.cor	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very informative
8/26/2020 18:45:00	athira97ajay@gmail.com	Excellent	Yes	Very good	Excellent	Excellent	Yes	Very much informative..
8/26/2020 18:45:03	beraanne08@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	No suggestions
8/26/2020 18:45:03	mabani1n@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	The virtual conference was a value added platform for study on macrocyclic systems. Overall the conference was informative.
8/26/2020 18:45:06	manishkumar0694@gmai	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Most interactive session
8/26/2020 18:45:06	gopiikahps@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Congratulations Sir on successful organization of this 3 day program. Everyone's hardwork paid off, it has come out really well
8/26/2020 18:45:07	jijinaravi98@gmail.com	Good	Yes	Excellent	Very Good	Very good	Yes	All sessions are highly informative
8/26/2020 18:45:09	suryabst999@gmail.com	Excellent	Yes	Very good	Very Good	Very good	Yes	It was an amazing conference , seeing the zeal of different scientists makes us inspired
8/26/2020 18:45:10	jinomath@gmail.com	Excellent	Yes	Very good	Very Good	Very good	Yes	Interesting and simple talk
8/26/2020 18:45:11	abhijithvinod2019@gmail.	Good	Yes	Very good	Very Good	Very good	Yes	Very informative
8/26/2020 18:45:20	bshiva321@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Dear sir/madam, congratulations organizing committee, its an excellent platform to me as pyrrolic chemist. great opportunity to meeting all the nice pyrrolic chemistry scientists. thank you.
8/26/2020 18:45:23	jishnugopal98@gmail.con	Good	Yes	Excellent	Excellent	Excellent	Yes	Very good and informative
8/26/2020 18:45:32	bhavanibotta.1@gmail.co	Excellent	Yes	Excellent	Very Good	Excellent	Yes	i find the conference intresting and very happy to find all the people of similar work on same platform. I found the sessions very intresting and knowledgable
8/26/2020 18:45:37	jyoti07rose@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was so much informative and thought- provoking
8/26/2020 18:45:41	ajp16@iisertvm.ac.in	Excellent	Yes	Very good	Excellent	Very good	Yes	It was a very nicely organised conference. We enjoyed it. Thanks for giving an opportunity to present a part of my work.

Timestamp	Email Address	1. What is your opinion at	2. Whether the invited spe	3. What is your opinion at	4. What is your opinion at	5. Overall opinion of the c	6. Whether the conferenc	7. Any suggestions or comments about the conference
8/26/2020 18:45:43	rimaraphey@yahoo.in	Good	Yes	Excellent	Excellent	Very good	Yes	was a good opportunity
8/26/2020 18:45:54	swagatkumar112@gmail.(	Excellent	Yes	Excellent	Very Good	Very good	Yes	Invited lectures was really very informative and motivating....Nice planning by Ravi sir and team ...But the time factor was little bit disappointing..but in last it was exciting..
8/26/2020 18:46:07	devulapallykoteshwar@gr	Excellent	Yes	Excellent	Good	Excellent	Yes	I had learned about porphyrin chemistry , useful to my carrer thanks to Ravi sir conducted this program.....over all this program is full enjoyed, learned so many things about porhyrins..
8/26/2020 18:46:19	anjalinnair1998@gmail.cc	Excellent	Yes	Very good	Very Good	Excellent	Yes	It was really good program, organized and conducted well and it was knowledgeable.
8/26/2020 18:46:24	r.govindreddy@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Conference is Excellent. Bringing of porphyrin family in one platform is grate success.
8/26/2020 18:46:45	cy19resch01002@iith.ac.i	Excellent	Yes	Excellent	Excellent	Very good	Yes	Very informative and very helpful for me this is my first conference in my PhD career. Thankyou very much for organizing this conference.
8/26/2020 18:47:14	naikravindra278@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent program
8/26/2020 18:47:20	greeshmajijo171@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Good
8/26/2020 18:47:25	camelia.dutta1041999@g	Good	Yes	Very good	Very Good	Very good	Yes	Is was a very informative session.
8/26/2020 18:47:27	bhadram1997@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very informative sessions
8/26/2020 18:47:28	sk.kanaparthi@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	super
8/26/2020 18:47:31	gourabhati66@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	very nice and benificial webiner
8/26/2020 18:47:46	swapnas2019pvr@gmail.(	Excellent	Yes	Very good	Excellent	Very good	Yes	Well organized program
8/26/2020 18:47:50	rajanandananair@gmail.c	Excellent	Yes	Very good	Excellent	Excellent	Yes	Well explained topics .
8/26/2020 18:47:54	sreelekhaajithu98@gmail	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Schedule and planning of conference was excellent.But there was some problem noticed in presenting the screen and all. I think it should be rectified.
8/26/2020 18:48:03	Seenasebastian2000@gr	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Try to avoid full day sessions, because of that some data problems occur, Anyway it is excellent
8/26/2020 18:48:12	anirudhkesar1998@gmail	Excellent	Yes	Excellent	Very Good	Excellent	Yes	Very informative and Learning
8/26/2020 18:48:21	sameetasahoo@gmail.co	Excellent	Yes	Excellent	Excellent	Excellent	Yes	This should be conducted in future also.
8/26/2020 18:48:42	anjana21995@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Please continue this.
8/26/2020 18:48:43	kalaitamil2012@gmail.cor	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Thank you for organizing and thanks to speaker!
8/26/2020 18:48:50	j.abraham.414@s.kyushu	Excellent	Yes	Excellent	Very Good	Very good	Yes	Apart from some small issues in the beginning, the conference was excellent. These many high profile professors under a single platform was really amazing.
8/26/2020 18:49:08	adasabc123@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	All the sessions were very interesting and exciting. I'm very glad to be a part of this webinar.
8/26/2020 18:49:11	bappasingha97@gmail.cc	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent presentation. I'm very satisfied
8/26/2020 18:49:15	jacksonhariet22@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	No suggestions to specify.
8/26/2020 18:49:32	ankitghosh830@gmail.co	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Great
8/26/2020 18:49:34	deepadrissya@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very informative
8/26/2020 18:49:41	drseenatx@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	it was highly valuable and useful
8/26/2020 18:50:14	shabanasyam86@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent coordination and interesting sections. Thanku entire team behind this webinar. Nice opportunity to see u all.
8/26/2020 18:50:51	erinas00@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was an excellent one.. Waiting for more conference like this
8/26/2020 18:52:16	shanalk1995@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	This was a fantastic conference. Thank you so much for the thoughtful and effective organization. I am impressed with commitment and efficiency of the invited speakers. Through this c
8/26/2020 18:52:31	knk77688@gmail.com	Good	Yes	Very good	Excellent	Excellent	Yes	Organise more such conference
8/26/2020 18:52:36	vishnu.mishra@students.i	Good	Yes	Very good	Excellent	Excellent	Yes	These kinds of conferences should conducted every year, so that we will come to know works going in progress in our field. Thank you sir
8/26/2020 18:52:40	divyakanna87@gmail.con	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It is very good informative conference
8/26/2020 18:53:37	akhila221.am@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Nice experience
8/26/2020 18:53:40	cy18resch11007@iith.ac.i	Excellent	Yes	Very good	Very Good	Excellent	Yes	Must be organized once in a year
8/26/2020 18:53:41	nithyanedumpilly@gmail.(	Good	Yes	Excellent	Excellent	Very good	Yes	I would like to thank the organizing committee for conducting the webinar without any registration fees.
8/26/2020 18:54:15	chaithrarajeev1234@gma	Good	Yes	Very good	Excellent	Excellent	Yes	very useful and informative.
8/26/2020 18:55:41	zakiyya117@gmail.com	Excellent	Yes	Excellent	Very Good	Very good	Yes	it was interesting
8/26/2020 18:56:24	ireen97maria@gmail.com	Excellent	Yes	Very good	Excellent	Very good	Yes	Though it was so informative, was not able to understand much. Felt it was good for PhD and post doc researchers.
8/26/2020 18:56:52	sachuvjoseph68@gmail.c	Good	Yes	Very good	Very Good	Good	Yes	Nice section. Gave a vast knowledge about the particular sugject
8/26/2020 18:57:04	manjusathyanath3@gmai	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It gave many ideas about porphyrin chemistry.Really it was a nice conference
8/26/2020 18:58:18	nagabhavanivadrevu@gn	Excellent	Yes	Excellent	Very Good	Very good	Yes	-
8/26/2020 18:59:00	pragati.shukla@students.	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Thanks alot the organizing committee. It was excellent conference and very informative. In these 3 days, I have got the chance to learn something new and inspiring. It's my request to all organizing committee to please conduct this conference every year, if possible. Thanks to all.
8/26/2020 18:59:42	nimishasasikumar50@gm	Excellent	Yes	Excellent	Excellent	Very good	Yes	Excellent opportunity and really inspiring
8/26/2020 19:01:49	archanaig02@gmail.com	Excellent	Yes	Very good	Very Good	Very good	Yes	As a msc student I really thank all the organisers for inviting us to be a part of this programme. The topic was new for me and for that it was a new experience to know about porphyrin c
8/26/2020 19:01:49	sameekshagoswamibpl@	Excellent	Yes	Excellent	Excellent	Excellent	Yes	All good
8/26/2020 19:02:18	arindamkundu.wb@gmail	Excellent	Yes	Very good	Excellent	Good	Yes	We want more like these
8/26/2020 19:03:22	soorya2109@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent
8/26/2020 19:03:32	sheenbaig@gmail.com	Good	Yes	Very good	Good	Good	Yes	Valuable information
8/26/2020 19:05:02	jyotsnabania44@gmail.co	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Extremely well organized and looking further for porphyrin conference next year.
8/26/2020 19:05:02	ashnageorge997@gmail.(	Excellent	Yes	Good	Excellent	Very good	Yes	It was really motivating.
8/26/2020 19:05:26	nimishasasikumar50@gm	Excellent	Yes	Excellent	Excellent	Very good	Yes	Excellent and really inspiring
8/26/2020 19:07:40	rishikadileep@gmail.com	Excellent	Yes	Excellent	Excellent	Very good	Yes	Well organized and a great opportunity.
8/26/2020 19:08:00	surabhidevis@gmail.com	Excellent	Yes	Excellent	Very Good	Very good	Yes	It was a very interesting and valuable conference.This is a very useful one for all the students especially those who would like to pursue research and further studies.
8/26/2020 19:11:08	christoadolf31@gmail.cor	Excellent	Yes	Very good	Excellent	Excellent	Yes	No
8/26/2020 19:11:24	aleeshanabhai326@gmai	Excellent	Yes	Very good	Excellent	Very good	Yes	Excellent
8/26/2020 19:13:27	athulnambiar73@gmail.cc	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Technical aspect
8/26/2020 19:15:03	rahulkanhirathingal@gma	Excellent	Yes	Excellent	Excellent	Excellent	Yes	The conference was really interesting.
8/26/2020 19:18:52	smrithisbabu007@gmail.c	Excellent	Yes	Very good	Very Good	Excellent	Yes	It was great experience
8/26/2020 19:26:44	soorajcherukunnu123@gi	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Good
8/26/2020 19:33:12	seelam.mohan123@gmai	Excellent	Yes	Excellent	Excellent	Excellent	Yes	No
8/26/2020 19:33:15	kolanusudhakar@gmail.cc	Excellent	Yes	Excellent	Excellent	Excellent	Yes	I am looking forward to see many more conference on porphyrinoids.
8/26/2020 19:34:13	dk98305@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Try to organize same next year too. Very interesting for young ppl.
8/26/2020 19:34:24	santoshg@vit.ac.in	Excellent	Yes	Excellent	Excellent	Excellent	Yes	The interactions were very friendly
8/26/2020 19:35:34	shabanasyam86@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent coordination and interesting session. Good work entire team.
8/26/2020 19:35:38	anandps8888@gmail.com	Good	Yes	Excellent	Very Good	Very good	Yes	Useful
8/26/2020 19:35:49	fathimamuhammedetpa@	Excellent	Yes	Very good	Excellent	Very good	Yes	No
8/26/2020 19:36:02	rajukota.chem@gmail.cor	Excellent	Yes	Excellent	Excellent	Excellent	Yes	No comments
8/26/2020 19:36:06	suneelchem@gmail.com	Excellent	Yes	Excellent	Excellent	Very good	Yes	Thank you for such a great initiative program
8/26/2020 19:36:21	kandukuris001@gmail.co	Excellent	Yes	Very good	Very Good	Very good	Yes	No
8/26/2020 19:37:26	souravsil11022018@gma	Excellent	Yes	Excellent	Excellent	Excellent	Yes	This was just fantastic and very much helpful. Thank you all.
8/26/2020 19:38:07	raveenavenugopal5832@	Excellent	Yes	Very good	Very Good	Very good	Yes	It was very informative
8/26/2020 19:38:20	darsanachayithalam@gm	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Everything was good and informative

Timestamp	Email Address	1. What is your opinion at	2. Whether the invited spe	3. What is your opinion at	4. What is your opinion at	5. Overall opinion of the c	6. Whether the conferenc	7. Any suggestions or comments about the conference
8/26/2020 19:39:03	sharmapratibha65@gmail	Excellent	Yes	Very good	Excellent	Excellent	Yes	It was amazing experience to listen all speakers .
8/26/2020 19:39:45	anjuldado@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very informative webinar.
8/26/2020 19:39:55	Shreeramesh@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent
8/26/2020 19:41:09	meghaakhil05@gmail.com	Good	Yes	Very good	Very Good	Excellent	Yes	no its very good
8/26/2020 19:41:23	rameshkumarv@cutn.ac.i	Excellent	Yes	Excellent	Excellent	Excellent	Yes	All session for wonderful
8/26/2020 19:41:54	silsubhra009@gmail.com	Good	Yes	Very good	Very Good	Excellent	Yes	Excellent webinar
8/26/2020 19:43:28	nikitha.jagadeesh22@gm	Excellent	Yes	Very good	Very Good	Very good	Yes	The conference helped to convey the informations nicely, about the recent research works.
8/26/2020 19:44:06	deepvas@gmail.com	Good	Yes	Very good	Very Good	Very good	Yes	Organisers could manage the whole program without any interruptions and with all the excellent speakers.
8/26/2020 19:44:24	lekshmijb1403@gmail.cor	Good	Yes	Very good	Very Good	Very good	Yes	No
8/26/2020 19:46:30	ahsanamuhammadali@gi	Good	Yes	Very good	Very Good	Excellent	Yes	No
8/26/2020 19:46:48	ramlithin3312@gmail.com	Good	Yes	Excellent	Excellent	Excellent	Yes	Overall good
8/26/2020 19:47:22	rageshreedash2000@gm	Excellent	Yes	Excellent	Very Good	Very good	Yes	Informative and useful conference
8/26/2020 19:47:57	archanamavundiri@gmail	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very informative talks..... Was very useful to clarifying many doubhts...
8/26/2020 19:47:59	swapnapriya16491@gma	Excellent	Yes	Very good	Very Good	Good	Yes	Give good information .
8/26/2020 19:48:06	arjun.warrier4539@gmail.	Excellent	Yes	Excellent	Very Good	Excellent	Yes	Very informative session.Especially the speakers.
8/26/2020 19:48:09	vidyasagaraknu@gmail.c	Good	Yes	Very good	Very Good	Very good	Yes	PROVIDE MORE WEBINARS.
8/26/2020 19:48:32	barthukattu1998@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Conference was overall excellent and we expect more webinars like this.
8/26/2020 19:49:01	diotima165@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	All the sessions and conferences were very informative and engrossing.
8/26/2020 19:49:18	ritikakubba@gmail.com	Excellent	Yes	Excellent	Very Good	Excellent	Yes	No , it was satisfactory
8/26/2020 19:49:50	anjaliballa123@gmail.com	Excellent	Yes	Very good	Excellent	Excellent	Yes	It is very enthusiastic and excellent conference. It will nice if are getting the opportunity to attend this type of virtual conference every year ..it is helpful to every body because no wastag
8/26/2020 19:50:35	guddu.dalal8@gmail.com	Excellent	Yes	Very good	Excellent	Very good	Yes	The conference was good and informative, also related to my research topic, which is about macrocyclic corrole systems. So, overall it gave me the idea about new application of corro
8/26/2020 19:50:38	deeptichauhan2570@gm	Excellent	Yes	Excellent	Excellent	Excellent	Yes	it was very much helpful
8/26/2020 19:50:54	rathor.shilpa21@gmail.co	Good	Yes	Very good	Excellent	Excellent	Yes	It seems perfect
8/26/2020 19:51:34	supreethakulal98@gmail.(	Good	Yes	Very good	Very Good	Very good	Yes	No
8/26/2020 19:51:47	jithukrishnalayam07@gm	Excellent	Yes	Very good	Excellent	Excellent	Yes	Very Useful
8/26/2020 19:51:48	emmaniel.ch999@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It's good
8/26/2020 19:51:57	cy20resch01002@iith.ac.i	Excellent	Yes	Very good	Excellent	Very good	Yes	It was very good and I attained first time such type of conference, I gained lot of knowledge from it. I Hartley thanks to organisers.
8/26/2020 19:52:52	aishimitra.chem@gmail.c	Good	Yes	Good	Very Good	Good	Yes	No comments
8/26/2020 19:54:53	dharmanlekshmi@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Conference is very useful for study life
8/26/2020 19:56:06	anjalouseph@gmail.com	Excellent	Yes	Very good	Very Good	Very good	Yes	Experiencing new field
8/26/2020 19:56:49	sajithkrishnan.nv@gmail.(	Excellent	Yes	Excellent	Excellent	Very good	Yes	Well organized conference with informative sessions
8/26/2020 19:57:05	souren.mondal12345@gr	Excellent	Yes	Very good	Excellent	Excellent	Yes	I know about green chemistry
8/26/2020 19:59:31	ahsanamuhammadali@gi	Excellent	Yes	Very good	Very Good	Very good	Yes	overall good
8/26/2020 20:01:49	amithganil@gmail.com	Good	Yes	Very good	Very Good	Very good	Yes	Please allow more time for students to present their work. 5 to 8 minutes seems too less to present an idea and defend it.
8/26/2020 20:04:18	prasantphenol@gmail.cor	Excellent	Yes	Very good	Excellent	Very good	Yes	It has been organised very nicely.Thank to dept. CU Kerala.
8/26/2020 20:06:53	naveen.kj87@sdmcujire.i	Good	Yes	Excellent	Excellent	Excellent	Yes	No
8/26/2020 20:07:36	supinkk09@gmail.com	Excellent	Yes	Very good	Excellent	Very good	Yes	Hoping to have it offline mode and one to one conversation
8/26/2020 20:08:50	saichetlapalle37@gmail.c	Good	Yes	Very good	Excellent	Very good	Yes	Nothing to tell overall conference is very good.
8/26/2020 20:12:20	avisiktasinha16@gmail.cc	Excellent	Yes	Excellent	Very Good	Very good	Yes	It was a really enriching experience
8/26/2020 20:13:16	vishnuap667771@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent webinar
8/26/2020 20:16:39	silsoma63@gmail.com	Excellent	Yes	Excellent	Very Good	Excellent	Yes	No comment
8/26/2020 20:17:30	vallabha4554@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	These type of conferences are helpful for those who are interested in research area
8/26/2020 20:21:19	priyapaulskm@gmail.com	Good	Yes	Good	Very Good	Very good	Yes	..
8/26/2020 20:22:06	abhishek201097@gmail.c	Good	Yes	Very good	Very Good	Very good	Yes	Very nice
8/26/2020 20:25:24	sajith@maharajas.ac.in	Good	Yes	Very good	Very Good	Very good	Yes	Stick to the timings. Time mamagement was lacking. Some of the presenters faced technical problems.
8/26/2020 20:28:47	cy18resch11014@iith.ac.i	Good	Yes	Excellent	Very Good	Very good	Yes	I learnt many things so really I thank to conference team
8/26/2020 20:32:11	deepa.j@cukerala.ac.in	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Morning sessions could have started a bit earlier
8/26/2020 20:33:02	shanalk1995@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was a fantastic conference. Thank you so much for your thoughtful and effective organisation. I am impressed with commitment and efficiency of the invited speakers. They have sho
8/26/2020 20:47:06	sindhutkarun@gmail.com	Good	Yes	Very good	Excellent	Very good	Yes	It is organized in a systematic manner.
8/26/2020 20:51:52	mannerajesh0007@gmail	Excellent	Yes	Excellent	Excellent	Excellent	Yes	I learned so many things about porphyrin chemistry.In this 3 days of conference very much helpful for my reaserch work. Greatful thanks to Dr ravi sir and team. Thanks Manne Naga Rajesh
8/26/2020 20:56:54	merinmartin96@gmail.cor	Excellent	Yes	Excellent	Excellent	Excellent	Yes	The classes which I had attended was informative
8/26/2020 21:04:54	nagamaiah1988@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	I don't have any comments on this conference it was so good and marvelous conference. I gained lot of knowled about porphyrin form speakers.Finally I would like thanks to whole orga
8/26/2020 21:05:27	pramodaju16@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was very good....Thanking Ravi sir and those who worked behind this...
8/26/2020 21:11:03	arshamr431@gmail.com	Good	Yes	Excellent	Very Good	Very good	Yes	Good
8/26/2020 21:15:15	sreekanth7036@gmail.co	Good	Yes	Very good	Excellent	Very good	Yes	Conference is provoking and raises our interest towards the porphyrin.
8/26/2020 21:18:48	aswinzasp4u@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	It was really good.
8/26/2020 21:18:53	suhasini@sxcce.edu.in	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Good
8/26/2020 21:24:22	sulthanaf50@gmail.com	Excellent	Yes	Very good	Excellent	Excellent	Yes	Nil
8/26/2020 22:25:41	vijinigiriraghava.98@gmai	Good	Yes	Very good	Very Good	Very good	Yes	Informative sessions
8/27/2020 8:52:38	tjana11698@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	This program is very helpful ..
8/27/2020 10:28:20	lekshmisree1511@gmail.(	Good	Yes	Very good	Excellent	Very good	Yes	Organising was very excellent.Most of the sessions were missed due to poor connectivity and other classes. You can organise conferences a one step forward in the near future.
8/27/2020 11:40:49	moabdulla5328@gmail.cc	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Very Informative and Interested
8/27/2020 11:41:39	arshamc27@gmail.com	Excellent	Yes	Very good	Excellent	Excellent	Yes	Informative
8/27/2020 12:08:57	kravada@gitam.du	Excellent	Yes	Very good	Excellent	Excellent	Yes	In this pandemic situation also Dr.Ravi and his team conducted very good webinar sessions with esteemed faculties from reputed institutes. Keep doing more in coming days.
8/27/2020 15:35:54	rama.msc1690@gmail.co	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Good
8/28/2020 13:06:44	sukantaorganic@gmail.cc	Good	Yes	Good	Very Good	Good	Yes	nice group work
8/30/2020 7:03:40	ramesh.hiremath@studer	Excellent	No	Very good	Very Good	Very good	Yes	It was really good . Initially I thought this virtual conference will go very boring and very difficult to stay on mob and listen for this much time but literally I don't know where time gone. I thing it's worth it.
8/30/2020 9:09:38	183041001@iitdh.ac.in	Good	Yes	Very good	Very Good	Very good	Yes	For the forcoming conference, it's good to add 3-4 lectures based on polymers material as well. Thank you
8/30/2020 10:23:13	maheshml127@gmail.cor	Excellent	Yes	Very good	Excellent	Excellent	Yes	No suggestions
8/30/2020 10:23:26	bijubasumatary.india@gr	Excellent	Yes	Very good	Excellent	Very good	Yes	I felt that some of the participants were not maitaining the profesional discipline which is required in a conference by not muting their audio/video. I wish organizing committe will take st
8/30/2020 10:40:27	sumeshmk1607@gmail.c	Excellent	Yes	Very good	Very Good	Good	Yes	Technical issues was a problem. But, it was also managed very well
8/30/2020 10:44:27	shanmugam_55555@yah	Excellent	Yes	Excellent	Excellent	Excellent	Yes	nil
8/30/2020 10:58:46	suneel.kanaparthy@gmai	Good	Yes	Very good	Excellent	Excellent	Yes	In this pandemic this was most welcoming conference. You people have done great job. I must congratulate convener and school of chemistry faculties of Central of Kerala.
8/30/2020 11:49:45	manjeevsingh5915@gma	Excellent	Yes	Very good	Very Good	Very good	Yes	Very informative
8/30/2020 13:42:35	marzeenas14@gmail.com	Excellent	Yes	Very good	Excellent	Excellent	Yes	The Q and A session was very lively!

Timestamp	Email Address	1. What is your opinion at	2. Whether the invited spe	3. What is your opinion at	4. What is your opinion at	5. Overall opinion of the c	6. Whether the conferenc	7. Any suggestions or comments about the conference
8/30/2020 16:17:57	neethujanupnr@gmail.cor	Good	Yes	Good	Very Good	Good	Yes	Good
8/30/2020 16:22:16	sreenavyanair92@gmail.c	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent
8/30/2020 21:18:17	kravada@gitam.edu	Excellent	Yes	Excellent	Very Good	Excellent	Yes	Very good virtual conference with good scientists from reputed institutes.
9/2/2020 17:55:21	deepaliahluwalia03@gma	Good	Yes	Excellent	Very Good	Very good	Yes	very well organized conference. fruitful knowledge obtained
9/3/2020 10:20:29	guttipavan123@gmail.cor	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent
9/4/2020 6:31:19	menge.mtrinity@gmail.co	Excellent	Yes	Very good	Very Good	Excellent	Yes	keep it up
9/4/2020 6:55:32	srinu.che209@gmail.com	Excellent	Yes	Excellent	Excellent	Excellent	Yes	Excellent conference
9/4/2020 11:01:31	ramyaanand08@gmail.co	Good	Yes	Excellent	Excellent	Very good	Yes	Good initiative