TWO DAY INTERNATIONAL SEMINAR ON

"CURRENT TRENDS AND FUTURISTIC CHALLENGES IN CHEMICAL SCIENCES"

29th & 30th JULY 2022

REPORT

Organized by

Department of Chemistry

University College of Science, Osmania University

under OU-UGC-SAP II PROGRAM

Chief Patron : **Prof. D. Ravinder**, (Vice- Chancellor, *OU*)
Patrons : **Prof. P. Laxminarayana** (Registrar, *OU*)
Prof. B. Reddya Naik (OSD to VC, *OU*)
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Prof. A. Balakishan (Dean, Faculty of Sciences, *OU*)
Prof. B. Veeraiah (Principal, UCS, *OU*)
Convener : **Prof. U. Umesh Kumar** (Head, Dept. of Chemistry, *OU*)
Contact No. 9440567567
Co-Conveners : **Prof. P. Leelavathi** (Chairperson, BOS, Dept. of Chemistry, *OU*)
Contact No. 9440621313
Prof. P.V. Anantha Lakshmi (Dept. of Chemistry, *OU*)
Contact No. 9849711487
Dr A. Hari Padmasri (Dept. of Chemistry, *OU*)
Contact No. 9441788898

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Dr. Thallada Bhaskar, Scientist, CSIR-IIP
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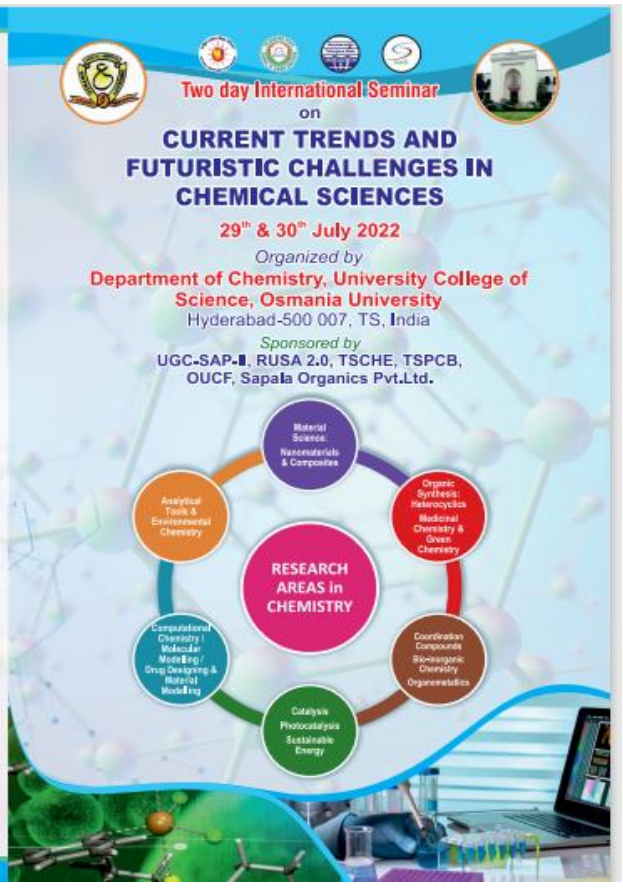
Abstract submission & Important Dates

Abstract of the research papers intended for presentation be submitted electronically as the MS-word file with Times new roman format (with font size 14 for title followed by authors name with affiliations below and 12 for the body of the abstract) to the email address given below latest by June 30, 2022. The abstract restricted to maximum 500 words, must contain the title of the paper, name(s) of the author(s) with affiliation(s) and email-id(s). The name of the presenting author must be underlined. The abstract should contain complete and unambiguous information on the original research work. The abstracts have to be mailed by the corresponding author to hodchemou@gmail.com before the mentioned last date.

CORRESPONDENCE

Convener, Current Trends And Futuristic Challenges In Chemical Sciences,
University College of Science, Osmania University, Hyderabad-500007, Telangana State, India.
Email: hodchemou@gmail.com, **Mobile No.:** 9963123387 / 9848792423
For details see web page: www.osmania.ac.in/chemistry/



Aims & Objectives: The Two Day International Seminar on Current Trends and Futuristic Challenges in Chemical Sciences aims to provide an opportunity for desired interaction among students, researchers and academicians working in different areas of chemical sciences. The main objectives of this seminar are to enhance knowledge, promote scientific temper and to highlight the recent trends and issues in the field of research in chemical sciences. It is expected that this international seminar will contribute to update knowledge in the field of these branches and will encourage the young researchers for promoting newer research endeavors in the challenging domain of modern science. It also provides a platform to investigate problems in the interdisciplinary fields leading to collaborative research. The seminar will embrace keynote address, lectures, plenary lectures, invited lectures, young scientist award presentations and paper presentations (oral and poster), that would include a broad set of research areas related to Synthetic and Bio-Organic Chemistry, Natural Products, Inorganic Chemistry, Physical Chemistry, Analytical Chemistry, Environmental Chemistry, Computational Chemistry, Polymer Chemistry. Industrial Chemistry and Pharmaceutical Chemistry, Nanomaterials, Functional Materials, Green Chemistry and Catalysis.

About Osmania University: Osmania University, one of the oldest and largest educational institutions, reflects the National agenda for higher learning, as well as the aspirations of its founder, Mir Osman Ali Khan, the 7th Nizam of Hyderabad. From a conservative center of study, this 100 year old University has now emerged as a premier institution of higher learning to meet the twenty first century goal in learning. The University has earlier emerged as a national leader in teaching and research with the highest rating of five-star status awarded by NAAC. Located in a sprawling campus spread over 1600 acres, the University provide a restful surrounding for scholarly pursuits. A jurisdiction of over 60,000 sq.km in the Telangana region of the state, covering a population of some 20 million, vests the university with more than 500 colleges offering 100 courses to nearly 2.5 lakh students. The University has attracted a sizeable number of students from over 30 countries. With Hyderabad, in the lead as far as information technology and Scientific Institutions are concerned, the University has an ever-increasing role to challenging student's intellect into higher spheres of advanced learning.

About Department of Chemistry

The Department of Chemistry, one of the oldest and biggest departments of Osmania University has a glorious history of 100 years and from 1928 onwards, the department started offering M.Sc. in chemistry along with B.Sc degree. Since then, the Department has grown with time by introducing specializations in Inorganic, Organic, Physical, Physical Organic, Analytical, Pharmaceutical, Pharmacoinformatics, Five Year integrated M.Sc in addition to the undergraduate B.Sc. teaching programme with combinations: MPC, BZC, BtBC, BtZC. In 2000 M.Sc forensic science has been introduced. Currently Osmania University has six constituent colleges, PG Centers at Mirzapur, Jogipet, Narasapur and Siddipet, about 32 private and government affiliated colleges offering M.Sc chemistry and 250 degree colleges offering B.Sc courses. The departmental library holds more than 11,000 text books, few foreign and national journals and houses more than 1000 theses in chemistry. The library provides reprographic facilities on payment basis and also caters to the needs of allied subjects who are enrolled as members. Researches are performed with aid of good facilities of instruments such as UV-VIS spectrophotometers, FTIR, XRD, Spectrofluorometry, Fuming hood, Rotary evaporators and so on in collaboration with different funding agencies such as DST-FIST, UGC-SAP, DST-PURSE.

About the City: Hyderabad, the capital of the Telangana State, is the fifth largest city of India, known for its rich history & culture with monuments, mosques, temples, a rich and varied heritage in arts, crafts and dance. Hyderabad was founded by Sultan Muhammad Quli Qutub Shah in 1591 AD on the banks of river Musi. It has emerged as India's Genome Valley and Pharmaceutical hub and most preferred destination for new business. It is also known as city of pearls or city of Nizams. Hyderabad offers a variety of tourist attractions ranging from heritage monuments, lakes and parks, gardens and resorts, museums, delicious cuisine and delightful shopping experience.

How to Reach: **By Air-** Rajiv Gandhi International Airport, Shamshabad is 36 km away from Osmania University. **By Rail-** Secunderabad Railway station is 6 km and Nampally Railway station, Hyderabad is 10 km away from Osmania University. **By Road-** Imliban MGBS Bus Stand and Jubliee Bus Stand (JBS) are around 8 km from Osmania University.

REGISTRATION Details & Important Last Dates

For Abstract Submission 30th June 2022	For Abstract Confirmation 9th July 2022	For Registration 10th July 2022
Category	**Indian Delegates**	**International Delegates**
For Research Scholars/Students	Rs. 500	$ 100
For Faculty members/Scientists	Rs. 1000	$ 200
Industry	Rs. 2000	$ 400

Registration fees can be paid in cash or through Demand Draft in favor of "Head, Department of Chemistry, Osmania University, Hyderabad", payable at Hyderabad in State Bank of India or through online payment in A/C no. 52198260896 (IFSC code: SBIN0020071, Branch: Osmania University, Branch Code: 20071, MICR No is 500004044, Swift Code: SBININBB).

Google form link for registration: https://forms.gle/ZYohob2mrhxu94W18

LOCAL HOSPITALITY

Delegates registered on or before July 10, 2022 will be provided accommodation (possibly shared). Delegates registered after July 10, 2022 will have to make their own arrangements for accommodation.

Venue: Department of Chemistry, University College of Science, Osmania University, Hyderabad-500 007, Telangana State, India.

INVITATION

Department of Chemistry, Osmania University,
Hyderabad, Telangana

Cordially Invites You to the

INAUGURAL CEREMONY

of the

TWO-DAY INTERNATIONAL SEMINAR

on

"CURRENT TRENDS AND FUTURISTIC CHALLENGES IN CHEMICAL SCIENCES"

29th & 30th, July 2022

Chief Guest	**Prof. R. Limbadri** Chairman, Telangana State Council for Higher Education
Presided by	**Prof. D. Ravinder** Vice-Chancellor, Osmania University
Special Guest	**Prof. Ashwini Nangia** Dean, School of Chemistry, UoH; Former Director, NCL-Pune
Guests of Honour	**Dr. Venepalli Bhaskar Rao** President & CEO, CiVenti Chem, USA
	Prof. A. Bala Kishan Dean, Faculty of Science, Osmania University
	Prof. B. Veeraiah Principal, UCS, Osmania University

Venue

Tagore Auditorium, Osmania University

Date: July 29th, 2022

Time : 09:00 a.m.

Prof. U. Umesh Kumar
Convenor & Head of the Department

Prof. P. Leelavathi	**Prof. P.V. Anantha Lakshmi**	**Dr. A. Hari Padmasri**
Co-Convenor & Chairperson-BoS	Co-Convenor	Co-Convenor

INVITATION

Department of Chemistry, Osmania University,
Hyderabad, Telangana

Cordially Invites You to the

VALEDICTORY CEREMONY

of the

TWO-DAY INTERNATIONAL SEMINAR

on

"CURRENT TRENDS AND FUTURISTIC CHALLENGES IN CHEMICAL SCIENCES"

29th & 30th, July 2022

Chief Guest	**Prof. Battu Satyanarayana** Vice-Chancellor, Central University of Karnataka, Gulbarga
Special Guest	**Dr. D. Srinivasa Reddy** Director, CSIR-IICT, Hyderabad
Guests of Honour	**Prof. P. Laxminarayana** Registrar, Osmania University
	Prof. G. Mallesham Dean, Development & UGC Affairs
	Sri. A. Bhaskar Reddy, Rtd. IRS Former Commissioner, IT & General Secretary, OUCF

Venue

Lecture Hall-I, Department of Chemistry, Osmania University

Date: July 30th, 2022

Time : 04:30 p.m.

Prof. U. Umesh Kumar
Convenor & Head of the Department

Prof. P. Leelavathi	**Prof. P.V. Anantha Lakshmi**	**Dr. A. Hari Padmasri**
Co-Convenor & Chairperson-BoS	Co-Convenor	Co-Convenor

PROGRAM SCHEDULE

DAY-1: 29th July 2022 8:00 a.m. – 9:00 a.m. **9:00 a.m. – 10:30 a.m.**	**Tagore Auditorium** REGISTRATION **INAUGURAL SESSION** **CHIEF GUEST**: **Prof. R. Limbadri**, *Chairman, TSCHE* **Presided by**: **Prof. D. Ravinder**, *Vice-Chancellor, Osmania University* **Special Guest:** **Prof Ashwini Nangia,** *Dean, School of Chemistry, UOH &Former Director, NCL, Pune* **Guests of Honour**: **Sri. A. Bhaskar Reddy.** *Former Commissioner, IT & General Secretary, OUCF* **Prof. A. Bala Kishan**, *Dean, Faculty of Science, Osmania Universit* **Prof. B. Veeraiah**, *Principal, UCS, Osmania University*		
10:30 a.m. – 11:00 a.m.	**TEA BREAK**		
11:00 a.m. – 12:00 p.m.	**Key Note Address by Dr Ashwini Nangia,** , *Dean, School of Chemistry, UOH &Former Director, NCL, Pune* **"***Crystal Engineering of Solid-state Pharmaceuticals: From Synthons to Salt-Cocrystal Drugs***"**		
Chairperson: **Dr. G. Sudhakar Reddy,** USA **12:00 p.m. – 12:30 p.m.**	**Plenary Lecture-1** Title:	**Prof Challa Vijay Kumar,** Univ.Connec., USA "*Entropy Control of Protein Thermodynamic Stability 0-,1-and 2-dimensions: Applications in vaccine delive plant CRISPR, and protein plastics***"**	
12:30 p.m. – 1: 00 p.m.	Plenary Lecture-2 Title:	**Dr Nitin Kumar Labhasetwar,** Chief Scientist, NEERI, Nagpur **"***Low-cost Materials for Cleaner Energy and Environmental Applications***"**	
1: 00 p.m. - 2: 00 p.m.	**LUNCH at Department of Chemistry**		
Parallel Sessions	**LH-1/** Chair Person: **Prof. HS P Rao**		**LH-2**/Chair Person: **Prof. Ch. Vijay Kumar**
2: 00 p.m. – 2:30 p.m. **Title:**	Invited Talk-1 **Prof Sudhakar G. Reddy,** Univ. Michigan, USA **"***Green chemistry applicable to the real-world needs through sustainability"*		Invited Talk-2 **Prof Hanumae Gowd** CUK **"***Identification of lanthionine bridges using Electron Transfer Dissociation mass spectrometry***"**
2:30 p.m. – 3:00 p.m. **Title:**	Invited Talk-3 **Prof Samar Kumar Das**, School of Chemistry, UOH **"***Polyoxometalates Towards Sustainable Energy***"**		Invited Talk-4 **Dr Venkata Sai Kiran** **Lead, R&D and Strategy** **Skyroot Aerospace Pvt. Ltd.** **"***Space Chemistry: A Chemical Science Perspective for ou New India***."**
3:00 p.m. – 3:30 p.m. **Title:**	Invited Talk-5 **Dr Kantevari Srinivas** **Senior Principal Scientist, CSIR-IICT, Hyd.** **"***Chemistry and biology of Heterocycles: Few examples from our journey towards drug discovery***"**		Invited Talk-6 **Dr K Nagesh Kumar**, Assoc. Director-Applications Lab, YMC India ltd., Hyderabad **"***Recent Advancements of Chiral chromatography for Pharmaceutical Drugs using HPLC***."**
3:30 p.m. – 4:00 p.m.	**TEA BREAK**		
4:00 p.m. – 5:00 p.m. **ORAL Presentations**	**LH-1** OP-1 to OP-10		**LH-2** OP-11 to OP-20
5:00 p.m. – 6:00 p.m. **POSTER Presentations**	**Left Corridor Wing** PP-1 to PP-60		**Right Corridor Wing** PP-61 to PP-120
6:00 p.m. – 8:00 p.m.	**Cultural Program (Tagore Auditorium)**		

8:00 p.m..	**DINNER at Department of Chemistry**

DAY-2: 30th July 2022 Parallel Sessions	**LH-1/Chair Person: Dr.N. Lingaiah Senior Principal Scientist, IICT**	**LH-2/Chair Person: Dr. D. A. Padmavathi Assoc. Prof., Dept. of Chem., OU**
9:00 a.m. – 9:30 a.m. **Title:**	Invited Talk-7 **Prof DebrabataMaiti,** Department of Chemistry, IITB **"***En-Light-ening C-H functionalization***"**	Invited Talk-8 **Dr G Rambabu,** Gitam University, Hyderabad "*New Therapeutic Agents for Dengue Virus: An Insilico approach to identify potential antiviral agent - A successful case study***"**
9:30 a.m. – 10:00 a.m. **Title:**	Invited Talk-9 **Dr Penumaka Nagababu,** Principal Scientist, NEERI, Nagpur **"***Emerging Inorganic Materials for Greenhouse Gases Mitigation***"**	Invited Talk-10 **Dr Ch Prabhakar,** NIT Kurukshetra **"***Charge Transport Characteristics in Linear and Star Shaped Organic Materials: A DFT insight***"**
10:00 a.m. – 10:30 a.m.	**TEA BREAK**	
LH-1 **10:30 a.m. – 11:00 a.m.** **Title:**	Chairperson: **Prof. G. Vijaya Charan** *Department of Chemistry, OU* Plenary lecture- **3** **Dr T Bhaskar,** Senior Scientist, CSIR –IIP **"***Design of strategies for effective utilization of lignin***"**	
11:00 a.m.-11:30 a.m.	Plenary lecture- **4** **Prof Sreekantha Babu Jonnalagadda,** University of KwaZulu-Natal, South Africa **"***Advanced Oxidation Processes (AOPs) and scope of mixed oxides as recyclable catalysts for water treatment***"**	
11:30 a.m. – 12:30 p.m.	**LH-1**	**LH-2**
ORAL Presentations	OP-21 to OP-30	OP-31 to OP-40
12:30 p.m. – 1:30 p.m. **POSTER Presentations**	**Left Corridor Wing** PP-121 to PP-160	**Right Corridor Wing** PP-161 to PP-201
1: 30 p.m. - 2: 30 p.m	**LUNCH BREAK**	
Plenary Session (LH-1) **2:30 p.m. – 3:00 pm.** **Title:**	Chair Person: **Prof. Anand Rao**, Retd. Prof., OU Plenary Lecture-5 **Dr G Kishan,** Founder & MD, Sravathi AP Technology Pvt Ltd., Bangalore **"***Role of New Tools in Chemical Industry – A Paradigm Change in Approach***"**	
3:00 p.m. – 3:30 p.m. **Title:**	Plenary Lecture-6 **Prof N Rajalakshmi,** IIT Dharwad **"***Fuel cell technology development – R & D to Market***"**	
3:30 p.m. – 4:00 p.m. **Title:**	Plenary Lecture-7 **Dr D Srinivasa Reddy,** Director, CSIR-IICT, Hyderabad **"***Natural Products based Drug Discovery: Our Group Efforts towards Lead Identification***"**	
4:00 p.m. – 4:30 p.m.	**TEA BREAK**	
4:30 p.m. – 5:30 p.m.	**VALEDICTORY SESSION** **Chief Guest:** **Prof. Battu Sathyanarayana,** *Vice-Chancellor, Central University of Karnataka* **Special Guest**: **Dr. D. Srinivasa Reddy,** *Director, CSIR-IICT, Hyderabad* **Guests of Honour: Prof. P. Laxminarayana,** *Registrar, Osmania University* **Prof. G. Mallesham,** *Dean, Development & UGC Affairs, OU*	

REPORT

Chemistry plays a central role in tackling many challenges. Indeed for decades chemists have provided countless solutions that have greatly contributed to the health, well-being and development of humankind, from the discovery of new medicine to the purification of water. There may be exciting new inventions and discoveries that help us see a brighter future but still many more discoveries are needed.

Keeping this in view, the chemistry department, Osmania University has taken an initiative to organize an international seminar in this area.

Over five hundred participants including faculty members and students have participated in the seminar. One keynote, seven plenary lectures and ten invited talks were delivered by eminent and outstanding speakers from across the globe. About 200 posters and 42 oral presentations were made by the participants mostly research scholars, some of the scientists, academicians and students pursuing post-graduation and under graduation as well.

The first day started with inaugural programme at the Tagore Auditorium, OU. **Dr A. Hari Padmasri,** the Co-Convener of the seminar welcomed the guests on to Dais and the event h began with the welcome address by **Prof. U Umesh Kumar**, Convener & Head, Department of Chemistry, University College of Science, Osmania University. It was followed by the addressing of **Prof. B. Veeraiah**, Principal, University College of Science who appreciated the efforts of Department of Chemistry in organizing the seminar and OUCF for its support to the Department of Chemistry. **Dr A Bhaskar Reddy**, Retd. IRS and General Secretary, OUCF spoke about the dichotomy of basic and applied research work. He opined that basic research from Universities is very essential to understand the essence of applied research. **Prof Ashwini Nangia**, the Dean, School of Chemistry, University of Hyderabad and former director, NCL pune graced the occasion as special guest and keynote speaker. He advised the researchers to look into the futuristic multi facets of chemistry as a central discipline.

The Chief guest of the inaugural function, **Prof Limbadri**, Chairperson, TSCHE praised the efforts of the organizers with respect to the challenges in chemical science research being discussed in the seminar. He also made a special mention of importance of higher education and constant review and changes that are required in the curriculum especially with regard to the new education policy that is implemented in the country. The Vice-Chancellor of OU, **Prof. D. Ravinder** who presided over the programme finally gave his remarks and applauded the Department of Chemistry as a model in engaging with its alumni in the overall development of the department.

The inaugural was followed by the Key note by **Prof Ashwini Nangia**. He emphasized on applied research work and in his key note had thrown light on the importance of X-ray crystallography and crystal engineering in the development of Pharmaceuticals of new and improved medicines. The technical sessions later started with the plenary lectures by **Prof Challa Vijay Kumar**, professor from University of Connecticut, USA and alumnus of the department of Chemistry, OU and **Dr Nitin KumarLabhasetwar**, a Chief Scientist from CSIR-NEERI, Nagpur. Prof Challa Vijaykumar spoke on how to control the entropy of

protein, denatured state by restricting them to 0,1,2 dimensional space and enhance protein stability even above 100 ^{o}C and the use of stabilized proteins for application of nanomaterials. Dr Nitin Kumar shredded light on low cost materials like perovskites, mixed metal oxides and intermetallics for cleaner energy and environmental applications. This session was chaired by **Prof G Sudhakar Reddy**, Univ. of Michigan, USA.

The post lunch session of the first day later started with the parallel sessions of invited talks chaired by **Prof. HSP Rao**, Retd. Professor from Pondicherry University and Alumnus of the Department comprising of the talks by **Prof Sudhakar G. Reddy,** Univ. Michigan, USA who spoke on green chemistry for sustainability and **Prof Hanumae Gowde**, Dept. of Chemistry, Central University, Karnataka at the same time gave his talk on application of mass spectrometry in parallel, the session being chaired by **Prof Challa Vijaykumar**, University of Connecticut, USA. The session in one hall was scheduled with the talks of **Prof. Samara Kumar Das**, School of Chemistry, University of Hyderabad on functional polyoxometalate materials followed by the talk of Dr Kantevari Srinivas, Senior Principal Scientist, CSIR-IICT, Hyderabad on Chemistry and biology of heterocyclic compounds. The talks by **Dr Venkata Sai Kiran,** Lead, R&D and Strategy, Skyroot Aerospace Pvt. Ltd. On Space Chemistry and prospects of Chemical science research for space applications and by **Dr K Nagesh Kumar**, Assoc. Director-Applications Lab, YMC India ltd, on Recent advancements in Chiral chromatography for pharmaceutical applications were covered in the parallel session in lecture hall 2 of the department.

The lecture session were then followed by the Oral presentations by the delegates arranged in parallel in the two lecture halls. **Prof. M. Vithal**, Emeritus Scientist and **Prof. D. Ashok**, UGC-BSR fellow of the department judged the presentations in one hall while **Prof P Leelavathi**, Chairperson, BOS, Dept. of Chemistry, OU and **Dr T Venkateswara Rao**, Principal Scientist from CSIR-IICT were the judges in lecture hall 2 held in parallel. Poster session by the delegates was judged by the Retd. Professor of the department **Prof P Veerasomaiah**, Retd. Professor from JNTUH, **Prof. Venkataramana Reddy**, **Dr Mangala Gowri**, Scientist, CSIR-IICT and **Dr D A Padmavathi**, Associate Professor, Dept. of Chemistry, OU. The day ended with cultural programmes by MSc students and performers from Telangana Mahila University students and other artists in Tagore auditorium, OU.

Day 2 started with yet another parallel session of Invited lectures of **Prof Debabrata Maiti**, IIT B on C-H functionalization aspects followed by the talk of **Dr Penumaka Nagababu**, scientist, CSIR-NEERI, Nagpur on Inorganic materials for mitigation of greenhouse gases. The parallel session at the same time had the lectures by **Dr G Rambabu**, Associate Professor, GITAM University, Hyderabad on In-silico approach to design antiviral drugs followed by the talk of **Dr Chetti Prabhakar**, Assistant Professor, NIT Kurukshetra on DFT studies in small molecules. These sessions were chaired by **Dr N Lingaiah**, Senior Principal Scientist, CSIR-IICT and **Dr D A Padmavathi**, Assoc. Professor, Dept. of Chemistry, OU respectively.

The second plenary session of the seminar started with the lecture by **Dr Thallada Bhaskar,** Senior Principal Scientist, CSIR-IIP, Dehradun who talked about the application of end products formed on thermochemical conversion of lignin. The other talk in this session was by **Prof Jonnalagadda Sreekanth Babu**, Senior Professor, University of Kwazulu Nattal, Durban, South Africa on degradation of non-biodegradable pesticides and herbicides

entering water bodies using ozone as an oxidant. This session was chaired by **Prof G Vijayacharan**, Dept. of Chemistry, OU.

The plenary session was followed by Poster and Oral presentations by the delegates. Oral presentations were judged by **Dr T Venkatewara Rao and Dr V Jayatirtha Rao**, Eminent Scientist, CSIR-IICT in one hall and parallel presentations were judged by Prof M Vithal and Prof. P. Vijay Kumar, Dept. of Chemistry, OU. The posters presentations were judged by **Prof P Srinivas**, Retd. Professor from JNTUH, **Prof. Venkataramana Reddy**, **Dr Mangala Gowri**, Scientist, CSIR-IICT and **Prof P V Ananthalakshmi**, Dept. of Chemistry,OU.

The final plenary session of the seminar started as a post-lunch session chaired by **Prof Anand Rao**, Retd. Professor of Dept. of Chemistry comprising of lectures by **Prof. N Rajalakshmi**, IIT, Dharwad on Development of Fuel Cell Technology from research and development to market followed by the talk on Role of new tools in Chemical industry with an emphasis on use of artificial intelligence by **Dr G Kishan**, CEO, Sravathi AP Technology Pvt. Ltd., Bangalore. The last lecture of the session was graced by **Dr. D Srinivasa Reddy**, Director CSIR-IICT and CSIR-IIIM, Jammu who focused on Drug Discovery based on natural products towards lead identification.

The last event of the two international seminar was the valedictory function which was graced by **Prof B Satyanarayana**, Vice-Chancellor, Central University of Karnataka as the chief guest and **Dr. D Srinivasa Reddy**, Director CSIR-IICT and CSIR-IIIM, Jammu as a Special guest. **Prof U Umesh Kumar**, Convener and Head, Dept. of Chemistry, OU gave his remarks on the valedictory followed by the report of the seminar by **Prof P Leelavathi**, Co-Convener and Chairperson, BoS, Dept. of Chemistry, OU. **Prof B Satyanarayana** emphasized on strengthening and focusing on basic sciences and science courses. He appreciated the efforts of the convenor and his team in organizing the seminar and said that these type of seminars are very helpful and necessary to motivate the students towards research in chemistry. **Dr D Srinivasa Reddy** reminded the role of science and technology for societal development particularly during the Covid period in developing vaccines and medicines. He discussed about the contribution of IICT in bringing out Covaxin by Bharat Biotech. He suggested that basic as well as applied sciences need to be focused by teachers to motivate the students towards research.

Some of the delegates of the seminar gave their feedback appreciating the hospitality and efforts of the organizers and requested that more such seminars be organized by the Department in future as well to encourage the research scholars and students. The delegates who present the best were awarded best poster and best oral presentation awards with cash prizes as well as certificates. 10 best poster awards and 5 best oral presentation awards were bestowed along with three special awards. One special award was given to a BSc student from Andhra Loyola College for the best poster and one special award to a MSc student **Mr.Fazil** from the Dept. of Chemistry, OU for best oral presentation. One other special oral presentation award was given to **Ms Mumtaz**, a foreign student from Iran pursuing her Ph.D from Dept. of Biochemistry, OU. The valedictory session came to an end with the formal vote of thanks by **Prof P V Ananthalakshmi**, Co-Convener of the seminar.

News Paper Clippings:

నవతెలంగాణ

కరెంట్ ట్రెండ్స్, కెమికల్ సెన్సెస్‌పై అంతర్జాతీయ సెమినార్

సైన్స్ కోర్సుల వైపు దృష్టి సారించాలి

- కర్ణాటక సెంట్రల్ యూనివర్సిటీ వీసీ ప్రొఫెసర్ భట్టు సత్యనారాయణ
- దేశాభివృద్ధిలో సైన్సు అండ్ టెక్నాలజీదే కీలకపాత్ర
- ఐఐసీటీ డైరెక్టర్ డా.శ్రీనివాస రెడ్డి
- ముగిసిన రసాయన శాస్త్రం అంతర్జాతీయ సెమినార్

అలరించిన ఆట పాట

సైన్స్ విద్యార్థులు సమ్మిళిత అభివృద్ధి కోసం కృషి చేయాలి

వైస్ చాన్స్‌లర్ ప్రొ. భట్టు సత్యనారాయణ

వైస్ చాన్స్‌లర్ ప్రొ. భట్టు సత్యనారాయణకు జ్ఞాపికను అందజేస్తున్న ప్రొ. ఉమేష్ కుమార్

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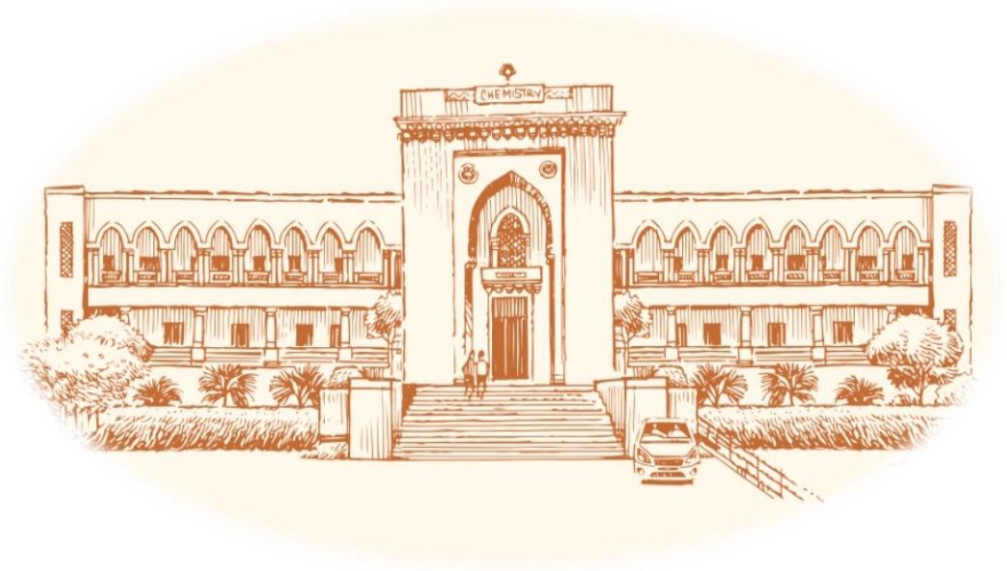
Photographs:

ONE-DAY NATIONAL SEMINAR ON

Organocatalysis:
Prospects and Opportunities

1st July 2023

REPORT



Organized by

DEPARTMENT OF CHEMISTRY

UNIVERSITY COLLEGE OF SCIENCE

OSMANIA UNIVERSITY

Brochure

ONE-DAY NATIONAL SEMINAR ON

ORGANOCATALYSIS: PROSPECTS AND OPPORTUNITIES

1st July 2023

Organized by

DEPARTMENT OF CHEMISTRY

University College of Science

Osmania University

About the Seminar

Department of Chemistry, Osmania University is delighted to invite researchers across the country to participate in the forthcoming One-Day National Seminar on "Organocatalysis: Prospects and Opportunities" 1st July 2023. Organocatalysis is a highly dynamic area in chemical research and being inexpensive provides an alternative to metal catalyzed reactions. The efficiency of organocatalysts leads to the application of such processes in the industry. A relatively new concept is the use of chiral organic catalysts. In this area, new opportunities are opening up for the development of extremely active catalysts that rival the efficiency of enzymes and that of the few superactive chiral transition metal complexes.

This Seminar aims to provide a greater insight into the latest research and advancement in the area of Organocatalysis at the juncture when the scientists who had contributed extensively in this area were crowned the Nobel prize in chemistry for the year 2022. This seminar provides a platform for interaction of the students, researchers and academicians working in different areas of chemical sciences.It is expected that this conference will contribute to update knowledge in the field of chemistry and will encourage the young researchers for promoting newer research endeavours in the challenging domain of modern science.This seminar will be useful for academicians, researchers and students in the universities as well as R & D scientists of any modern industries.

Objectives of the Seminar:

- To bring awareness on new developments in chemical sciences and in particularly in Organocatalysis.
- To create interest and broaden the horizon of knowledge among students in recent advancements.
- To foster the understanding of the use of organocatalysis for the advancement of chemical sciences in the field of medicine and pharmaceuticals.

About Osmania University

Osmania University, one of the oldest and largest educational institutions, reflects the National agenda for higher learning, as well as the aspirations of its founder, Mir Osman Ali Khan, the 7th Nizam of Hyderabad. From a conservative centre of study, this 100 year old University has now emerged as a premier institution of higher learning to meet the twenty first century goal in learning. The University has earlier emerged as a national leader in teaching and research with the highest rating of five -star status awarded by NAAC, located in a sprawling campus spread over 1600 acres, the University provides a restful surrounding for scholarly pursuits. A jurisdiction of over 60,000 sq.km in the Telangana region of the state, covering a population of some 20 millions, vests the university with more than 500 colleges offering 100 courses to nearly 2.5 lakh students. The University has attracted a sizeable number of students from over 30 countries. With Hyderabad, in the lead as far as information technology and Scientific Institutions are concerned, the University has an ever-increasing role to challenging student's intellect into higher spheres of advanced learning. Departments of Physics, Chemistry and Mathematics are from the oldest departments of the University. These departments have excellent records in teaching and research. In view of their excellence, UGC, has granted their several important programmes including DSA (Phase I) to Mathematics Department and DSA (Phase III) to Physics Department. The Department of Chemistry is also trying to get status of Centre of Advance Studies.

About Department of Chemistry

The Department of Chemistry, one of the oldest and biggest department of Osmania University has a glorious history of 100 years and from 1928 onwards, the department started offering M.Sc. in chemistry along with B.Sc degree. Since then, the Department has grown with time by introducing specializations in Inorganic, Organic, Physical, Physical organic, Analytical, Pharmaceutical, Pharmacoinformatics, Five Year integrated M.Sc in addition to the undergraduate B.Sc. teaching programme with combinations: MPC, BZC, BtBC, BtZC. In 2000 M.Sc forensic science has been introduced. Currently Osmania University has six constituent colleges, one PG Centre at Mirzapur (Medak district), two more centers at Jogipet and Narasapur, about 120 private and Government affiliated colleges offering M. Sc chemistry and 50 degree colleges offering B. Sc courses. The departmental library holds nearly 11,000 text books, few foreign and national journals and houses nearly 1000 theses in chemistry including organic, inorganic and physical chemistry. The library provides reprographic facilities on payment basis and also caters to the needs of allied subjects who are enrolled as members. Researches are performed with aid of good facilities of instruments such as UV-VIS spectrophotometers, FTIR, XRD, Spectrofluorometry, Fuming hood, Rotary evaporators and so on in collaboration with different funding agencies such as DST-FIST, UGC-SAP, DST-PURSE.

About Hyderabad

Hyderabad, the pearl city of India and the capital of Telangana province, along with its twin city Secunderabad has over 400 years of history. Hyderabad, the fifth largest city in India with a population of over 6 million, is a jewel of Deccan region and possesses a heady mixture of heritage, traditional hospitality and a thriving software revolution. It has a mixed culture with a cluster of beautiful, ancient palaces and monuments of historical importance. Hyderabad with its rich cultural backdrop, is famous world over for its fabulous diamond markets, pearls, glass embedded bangles and the delectable Hyderabadi cuisine. The city has an international airport and there are several tourist attractions in and around Hyderabad (Charminar, Golconda Fort, Salarjung Museum, Largest Monolithic Buddha Statue in the middle of famous Hussain Sagar Lake and Ramoji Film City, etc.). It has also emerged as India's Silicon Valley and Pharmaceutical hub and most preferred destination for new business.

List of Speakers :

- **Plenary Lecture - 1 : Prof. D. Basavaiah**, School of Chemistry, UoH, Hyderabad.
- **Plenary Lecture - 2 : Prof. D. B. Ramachary**, School of Chemistry, UoH, Hyderabad.
- **Plenary Lecture - 3 : Dr. Akkattu T. Biju**, Associate Professor, Dept. of Organic Chemistry, IISC, Bangalore.
- **Plenary Lecture - 4 : Dr. Ch.Rambabu**, Principal Scientist, CSIR-IICT, Hyderabad

Important Dates

Last date for registration : 25th June, 2023

Registration details

Category	Registration Fee
For Research Scholars/Students	Rs. 250
For Faculty members/Scientists	Rs. 500
Industry	Rs. 1000

Registration fees can be paid in cash / online transfer, Gpay, Phonepay or Paytm to the account / Demand Draft in favour of **"The Head, Department of Chemistry, Osmania University, Hyderabad"**, payable at Hyderabad in State Bank of India or through online payment in

A/C no. 52198260896 (IFSC code: SBIN0020071, Branch: Osmania University, Branch Code: 20071; MICR No. 500004044; Swift Code: SBININBB).

Google Form Link for Registration: https://forms.gle/UQ7DgBysSMmLjvNK7

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Invitation

DEPARTMENT OF CHEMISTRY

Osmania University, Hyderabad, Telangana

Cordially Invites You to the

INAUGURAL CEREMONY

of the

ONE DAY NATIONAL SEMINAR ON

"ORGANOCATALYSIS: PROSPECTS AND OPPORTUNITIES"

Date: 1st July, 2023 | Time: 09.00 a.m.

Chief Guests

Prof. Battu Satyanarayana
Vice-Chancellor,
Central University of Karnataka

Dr. S. Chandrashekar
Secretary, DST-India

Presided by

Prof. D. Ravinder
Vice-Chancellor, Osmania University

Guest of Honour

Prof. A. Bala Kishan
Dean, Faculty of Science
Osmania University

Venue

Lectrure Hall-I, Department of Chemistry,
Osmania University

Prof. U. Umesh Kumar
Convenor and Head of the Department

Prof. J. Ramchander
Co-Convenor & Chairperson-BOS,
Forensic Science

Prof. G. Vijaya Charan
Co-Convenor

Invitation

DEPARTMENT OF CHEMISTRY

Osmania University, Hyderabad, Telangana

Cordially Invites You to the

VALEDICTORY CEREMONY

of the

ONE DAY NATIONAL SEMINAR ON

"ORGANOCATALYSIS: PROSPECTS AND OPPORTUNITIES"

Date: 1st July, 2023 | Time: 04.30 p.m.

Chief Guest

Prof. P. Laxminarayana
Registrar, Osmania University

Guests of Honour

Prof. G. Mallesham
Dean, Development & UGC Affairs

Prof. B. Veeraiah
Principal, UCS, Osmania University

Venue

Lectrure Hall-I, Department of Chemistry,
Osmania University

Prof. U. Umesh Kumar
Convenor and Head of the Department

Prof. J. Ramchander
Co-Convenor & Chairperson-BOS, Forensic Science

Prof. G. Vijaya Charan
Co-Convenor

ONE-DAY NATIONAL SEMINAR on

"Organocatalysis: Prospects and Opportunities"

1st JULY 2023

Organized by

Department of Chemistry

University College of Science, Osmania University

PROGRAM SCHEDULE

Venue: Lecture Hall-1

8:30 a.m. – 9:00 a.m.	**Registration**
9:00 a.m. – 1:00 p.m. **9:00 a.m. – 9:05 a.m.**	**INAUGURAL SESSION** Welcoming the Guests on to the Dais by **Prof. G. Vijaya Charan** **Prof. U. Umesh Kumar, Head, Dept. of Chemistry, OU** Presided by: **Prof. D. Ravinder, Vice-Chancellor, OU** Chief Guests: P**rof. B. Satyanaryana, Vice-Chancellor, CUK** **Dr. S. Chandrasekhar, Secretary, DST-India** Guest of Honour: P**rof. D. Karuna Sagar, Dean, Faculty of Science, OU**
9:05 a.m.-9:10 a.m.	Lightening of the Lamp
	Prayer Song by **Ms. Revathi Sundaramurthy**, *Research Scholar*
9:10a.m.-9:15a.m.	**Prof. D. Ravinder**, *Vice-Chancellor, OU* shall **preside** over the program
	Welcome Address by **Prof. U. Umesh Kumar,** *Convener & Head, Dept. of Chemistry, OU* **About the Seminar** by **Prof. J. Ramchander**, *Co-Convener*
9:15 a.m - 9:20 a.m. **9:20 a.m.-9:45 a.m.** **9:45 a.m. - 10:00 a.m.**	Address by the Guest of Honour: P**rof. D. Karuna Sagar** Message by the Chief Guest: **Dr. S. Chandrasekhar** Address by Chief Guest: P**rof. B. Satyanaryana**
10:00 a.m.-10:10 a.m.	Presidential Remarks by **Prof. D. Ravinder,** *Vice-Chancellor, OU*
10:10 a.m.- 10:30 a.m.	Felicitations to the Guests
	Formal vote of thanks by **Dr. M. Kavitha**
10:30 a.m.-11:00 a.m.	**TEA BREAK**
11:00 a.m - 11:45 a.m.	**Invited Lecture -1: "The Baylis-Hillman reaction: Our vision, thirty nine years of our experience and contributions"** **by Prof. D. Basavaiah,** IoE Research Chair Professor, School of Chemistry, University of Hyderabad
11:45 a.m. - 12:30 p.m.	**Invited Lecture -2: "Discovery of Parts-per-Million-Level, Catalytic Asymmetric Annulations"** **by Prof. D. B. Ramachary,** Professor of Organic chemistry, School of Chemistry, University of Hyderabad

12:30 p.m. - 1:15 p.m.	**Lunch Break**
1:15 p.m. - 2:00 p.m.	**Invited Lecture-3: "Organocatalysis using N-Heterocyclic Carbenes (NHCs)"** **by Dr. Akkattu T. Biju,** Associate Professor, Department of Organic Chemistry, IISc, Bangalore
2:00 p.m. - 2:45 p.m.	**Invited Lecture-4: "Enantioselective Desymmetrization Using Organocatalysis"** **by Ch. Rambabu,** Principal Scientist, CSIR-IICT
2:45p.m. - 4:15 p.m.	**Special Power-Point Presentations by MSc students**
4:15 p.m. - 4:30 p.m.	**TEA BREAK**

4:30 p.m. - 5:30 p.m.	**VALEDICTORY SESSION**
4:30 p.m. - 4:40 p.m.	Welcoming the Guests on to the Dais by **Prof. P.V. Ananthalakshmi** **Prof. U. Umesh Kumar,** Head, Dept. of Chemistry, OU Presided by: **Prof. B. Veeraiah, Principal,** Univ. College of Science, OU Chief Guest: **Prof. P. Laxmi Narayana,** Registrar, OU Guest of Honor: **Prof. G. Mallesham,** Dean**,** Development & UGC Affairs, OU
4:40 p.m. - 5:15 p.m.	**Feed Back by Participants** **Remarks** by **Prof. U. Umesh Kumar** *Convener & Head, Dept. of Chemistry, OU* Report of the Seminar by **Prof. G. Vijaya Charan,** Co-Convener Address by Guest of Honor: **Prof. G. Mallesham** Message by Chief Guest**: Prof. P. Laxmi Narayana** Presidential Remarks by **Prof. B. Veeraiah**
5:15 p.m. -5:25 p.m.	**Presentation of Awards to Students** **Felicitation of Guests**
5:25 p.m. - 5:30 p.m.	**Vote of Thanks by Dr. P. Muralidhar Reddy** **National Anthem**

Report

Department of Chemistry constantly strives to bring in the latest happening in the discipline of chemistry all around the world conducting national and international seminars, conferences and workshops for students, researchers and the teaching fraternity as well by inviting eminent speakers and researchers. In continuation of those efforts this one day seminar on the **"Organocatalysis: Prospects and Opportunities"** was organized with the main objectives to bring awareness on new developments in chemical sciences and in particularly in Organocatalysis. Further, to create interest and broaden the horizon of knowledge among students in recent advancements and applications of organocatalysis for the advancement of chemical sciences in the field of medicine and pharmaceuticals.

The Seminar was started with the Inaugural session, welcoming the guests on to the dais by Prof. G. Vijaya Charan, the Co-Convener of the seminar followed lighting of the lamp by dignitaries with a prayer song by Ms. Revathy, research scholar of the department. The participants and the guests were formally welcomed by Prof. U. Umesh Kumar, the Convener and the Head, Dept. of Chemistry, University College of Science, Osmania University with his opening remarks. Prof. D. Ravinder, the Vice-Chancellor of Osmania University presided over the inaugural session. Dr. S. Chandrasekhar, Secretary, DST, Govt. of India and Prof. B. Satyanarayana, Vice-Chancellor, Central University of Karnataka graced as chief guests and Prof. D. Karuna Sagar, Dean, Faculty of Science was the guest of honour.

Prof. J. Ramchander, Co-Convener of the seminar presented the objectives of organizing the seminar and about the theme of the seminar. He mentioned that since organocatalysis being one of the most thriving areas of research in the organic synthesis, the seminar is significant in creating awareness among the young researchers about the latest developments in the area. Prof. Karuna Sagar appreciated the efforts of Department of Chemistry in organizing the seminar on organocatalysis and spoke about chemistry being central to all other disciplines of science and about the significance of organocatalysis. Dr. S. Chandrasekhar emphasized on focussing the research in chemical sciences and overall in sciences directed towards the environmentally safe and sustainable world. He further mentioned that efforts to be placed in achieving zero carbon foot print in chemical industries as well as in all the human activities. He also spoke about efforts to be placed for self-reliance to suit the requirements of the

nation. Prof. B. Satyanarayana also suggested that the research in chemical sciences should be towards the development of the society and mankind. He focussed his talk on the need to minimize waste and prevent the pollution that directly affects the society and environment by looking for all possible means to clean up and treat the waste before instead of dumping it as garbage. The Vice-Chancellor, Prof. D. Ravinder gave his presidential remarks congratulating the efforts of the organizers in conducting the seminar. The inaugural session ended with felicitation to the guests by the dignitaries and vote of thanks by Dr. M. Kavitha, Asst. Professor, Dept. of Chemistry, OU.

The seminar had four plenary talks split into two technical sessions that were pre-lunch and post-lunch sessions. The technical session-I after the tea break comprised of two plenary lectures by Prof. D. Basavaiah and Prof. D.B. Ramachary from School of Chemistry, UOH. The session was coordinated by Prof. V. Vijay Kumar of the dept. of chemistry, OU. He formally welcomed the speakers and introduced them and invited to deliver the talk. Prof. D. Basavaiah lecture was entitled "**The Baylis-Hillman reaction: Our vision, thirty nine years of our experience and contributions".** He talked on the fundamental aspects of organocatalysis and about bond formation/cleavage using functional groups and carbon chain manipulation. He explained the methods for developing molecules with 3 or more functional groups in the vicinity and ways of executing Bayles-Hilmann reaction. The second speaker of the seminar Prof. D.B. Ramachary gave a lecture on **"Discovery of Parts-per-Million-Level, Catalytic Asymmetric Annulations"** in which he shared his research work on organocatalysis applying new thought and ideas in click chemistry i.e., by strain promotion. He discussed the methods of constructing 5 membered ring using exo-enolates involved in the development of asymmetric supramolecular organocatalysis using ppm levels of catalysts for the synthesis of skeletons for pseudo terpenoids. Prof. V. Vijay Kumar concluded the session with his remarks and vote of thanks to speakers and dignitaries who presented mementos to the speakers.

Technical session-II started after the lunch break consisting of two plenary talks by Dr. Akkattu Biju, Dept. of Chemistry, IISC and Dr. Ch. Rambabu, Principal Scientist, CSIR-IICT. This session was conducted by Prof. A. Hari Padmasri, Dept. of Chemistry, OU. The first talk in this session by Dr. Akkattu Biju was entitled **"Organocatalysis using N-Heterocyclic Carbenes (NHCs)"**. Dr. Biju shared valuable information on Aryne Chemistry and N-heterocyclic carbene Organocatalysis and their applications for the synthesis of

indoles, quinolines and dihydroquinoxalines. He discussed about the umpolung strategy of aldehydes for the NHC catalyzed atroposelective synthesis of N-aryl succinimides via the desymmetrization of N-aryl maleimides. The second talk was by Dr. Ch. Rambabu on **"Enantioselective Desymmetrization Using Organocatalysis"**. He presented his research strategy in the Desymmetrization of symmetric molecules as a means to generate multiple stereocentres in a single operation with 100% theoretical yield from simple starting materials. He also talked about Organocatalytic enantioselective desymmetrization of prochiral substrates. He discussed some of their enantioselective approaches on prochiral cyclohexa-2,5-dienones and cyclic 1,3-diones for the construction highly functionalized scaffolds. He discussed about the application of SOMO activation and Lewis base organocatalysis. Prof. A. Hari Padmasri concluded the session after the felicitation of the speakers by the dignitaries with her remarks and a formal vote of thanks.

The next session was a special session comprising of a competition on power point presentations on the theme of this seminar by M.Sc students of the department. This was a small event introduced to involve the students and encourage them to learn and present their views on one of the very happening areas of research today ie., Organo catalysis. This was intended to bring some awareness as well as enthusiasm among the students to imbibe the concepts and understand the significance of organocatalysis. This session was conducted by Prof P Vijay Kumar and Prof D. A. Padmavathi of the Dept. of Chemistry. Prof. D. Ashok, Adjunct Profesor, JNTU-H and Dr. Ch. Rambabu, Principal Scientist, CSIR-IICT judged the competition. About 10 students participated and gave the presentation on theme of the seminar with great enthusiasm and zeal.

The final session, which was the valedictory session started after a short tea break. This session was conducted by Prof. P. V. Ananthalakshmi by welcoming the guests on to the dais. The valedictory program was graced by Prof. P. Laxmi Narayana, Registrar, OU as the chief guest, Prof. G. Mallesham, Dean, Development & UGC Affairs, OU and Prof. B. Veeraiah, Principal, University College of Science, OU as the guests of honour. The program started by the feedback from some of the participants. Ms. Divya, Lecturer from KV Ranga Reddy College for Women expressed being glad to be present at the seminar and felt had gain lot of awareness on organocatalysis. Some of the students from the social welfare college also expressed their gratitude to the convener of the seminar for giving them opportunity to attend the seminar with a fee waiver. The seminar was attended good number by students and

faculty from various constituent and affiliated colleges of Osmania university viz., RBVRR College for Women, St. Ann's College for Women, Mehdipatnam, Sarojini Naidu Vanitha Mahavidalaya, Govt. Degree College, Begumpet, GDC, Nayapul, Indira Priyadarshini College for Women, Nampally, City College, Lords Institue of Engineering and Technology, St. Peters Engineering College, St. Pious College for Women, UCSS, Saifabad, Nizam College, PG College, Secunderabad, OU PG College, Mirzapur, AMS Arts & Science College for women, GDC, Narayankhed, NB Science College, NTR-GDC, KV Ranga Reddy College for Women, Vivekananda College of Science, Humanities & Commerce, Bhavan's Degree College, St. Francis College for Women. Students and faculty from CSIR-IICT, Telangana Social Welfare Residential Degree for Women, Telangana Mahila Viswavidyalayam, KDC, Hanamkonda, Kakitya University, GITAM University and IISER, Thiruvanthapuram, Mahatma Gandhi University, Nalgonda, MJPTBC Residential College for Women, Warangal, Palamuru University, TSWRD & PGCW, Mahendra Hills along with research scholars working under the dept. of chemistry, OU also participated in the seminar. A total of about 500 members have attended the seminar. With more than 100 teachers and rest of them being PG & UG students from the department of chemistry, OU and other colleges mentioned above.

Prof. G. Vijaya Charan, Co-Convener of the Seminar presented a brief report of the event. And Prof. U. Umesh Kumar, the Convener & Head, Dept. of Chemistry, OU gave his remarks and thanked the guests, speakers, participants and the sponsors for the successful conduction of the event. Prof. B. Veeraiah, the guest of honour appreciated the Dept. of Chemistry for constantly engaging with academic activities to motivate the students and staff. He said that the activities of the department motivated him to announce such events to be organized at the Science College level involving all the departments of the college. He appreciated the enthusiastic participation of students and staff in the event. Prof. G. Mallesham expressed his happiness being present at seminar and appreciated the research contributions from the Department of Chemistry, OU. Prof. P. Laxminarayana, the Registrar of OU and the chief guest of the event said he was always inspired by the dept. of chemistry as a student and appreciated the initiation of the department to take up such activities and encouraged to take up to more such activities to inspire and motivate the young researchers and students.

The MSc students who won the competition of presentation on the theme of the seminar were awarded cash prizes and certificates by the dignitaries. All the student participants were given books on chemistry as gifts in appreciation of their active participation. The event came to an end with the felicitation to the guests by the Convener and other faculty members of the department followed by formal vote of thanks by Dr. P. Muralidhar Reddy, Asst. Professor, Dept. of Chemistry, OU. He extended thanks and appreciation to all the speakers, guests, sponsors, participants, faculty members, student volunteers, non-teaching staff and helpers on behalf of the organizers and the Dept. of Chemistry, OU.

News Paper Clippings:

నవతెలంగాణ

సమాజంలో సైన్స్ అండ్ టెక్నాలజీది కీలక పాత్ర

నవతెలంగాణ-ఓయూ

మారుతున్న నేటి ప్రపంచంలో సైన్స్ అండ్ టెక్నాలజీ కీలక పాత్ర పోషిస్తున్నాయి అని, రహదారి నుంచి భవనాలు, దుకాణం నుంచి విద్యా సూచనల వరకు ప్రతీది ఆధునిక శాస్త్ర, సాంకేతిక ఫలితమే అని డీఎస్టీ ఇండియా సెక్రెటరీ డా.ఎస్.చంద్ర శేఖర్ అన్నారు. ఓయూ డిపార్ట్మెంట్ ఆఫ్ కెమిస్ట్రీ ఆధ్వర్యంలో ఆర్గనో కేటాలసిస్ : ప్రాస్ ప్రేక్ట్ అండ్ ఆపర్చునిటీస్ అనే అంశంపై జరిగిన ఒక్క రోజు సెమినార్లో అన్నారు. సెంట్రల్ యూనివర్సిటీ ఆఫ్ కర్ణాటక వీసీ ప్రొ.భట్టు సత్యనారాయణ మాట్లాడుతూ నీరు, నీటి కాలుష్య నివారణలో రసాయనిక శాస్త్రం ప్రాముఖ్యత, ప్రాధాన్యత గురించి వివరించారు. ఓయూ వీసీ ప్రొ.రవీందర్ మాట్లాడుతూ ఓయూలో కెమిస్ట్రీ అతి పెద్ద విభాగం అనీ, ఇలా నిత్యం సెమినార్స్, సదస్సులు నిర్వహించటం హర్షణీయం అన్నారు. సెమినార్ ఉద్దేశాన్ని విభాగం హెడ్, కన్వీనర్ ప్రొ.యు.ఉమేష్ కుమార్ వివరించారు. విభాగం పురోగతిని వివరించి, ఆలూమిని అందిస్తున్న కృషి తోడ్పాటుకు ప్రశంసలు కురిపించారు. సెమినార్ కో-కన్వీనర్స్ ప్రొ.జె.రాం చందర్, ప్రొ.జి.విజయచరణ్ సెమినార్ ప్రధాన ఉద్దేశాన్ని ఆబ్జెక్ట్స్ వివరించారు. ఈ కార్యక్రమంలో డీన్ ప్రొ.కరుణసాగర్, బీఓఎస్ ప్రొ.లీలావతి, బోట అధ్యక్షుడు ప్రో.మనోహర్, ప్రొ.విజయ్ కుమార్, ప్రొ.గంగాధర్, ప్రొ.సక్రమ్, ప్రొ.హరి పద్మశ్రీ, ప్రొ.ఆనంతలక్ష్మి, ప్రొ.సరితారెడ్డి, ప్రొ.పి.మురళీధర్‌రెడ్డి, ప్రొ.లక్ష్మారెడ్డి, ప్రొ.కవిత, ప్రొ.పద్మావతి, ప్రొ.సోమేశ్వర్, ప్రొ.గిరి, ప్రొ.శిరీష, ప్రొ.రాజు రెడ్డి పాల్గొన్నారు.

ముగింపు సందర్భంగా..

సాయంత్రం జరిగిన సెమినార్ ముగింపు కార్యక్రమంలో ఓయూ రిజిస్ట్రార్ ప్రొ.పి.లక్ష్మీనారాయణ, యూజీసీ డీన్ ప్రొ.లక్ష్మి నారాయణ, ప్రిన్సిపాల్ ప్రొ.వి.వీరయ్య సెమినార్‌ను ఉద్దేశించి ప్రసంగించారు. ఈ సందర్భంగా ఎంఎస్సీ విద్యార్థులకు సెమినార్ అంశంపైన పవర్ పాయింట్ ప్రెజెంటేషన్ పోటీలు నిర్వహించి విజేతలకు బహుమతులు అందజేశారు. సెమినార్‌లో ముఖ్య వక్తలుగా ప్రొ.డి.బసవయ్య ప్రొ.రామచారి, విజు రాంబాబు వివిధ అంశాలపై ప్రసంగించారు.

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Photographs

Inaugural Session

Felicitation of Guests in the Inaugural Session

Technical Session-I

Technical Session-II

Valedictory Session



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UGC-MMTTC (HRDC)
Osmania University, Hyderabad
Refresher Course in Chemistry (6.12.2023 to 20.12.2023)

REPORT

The Department of Chemistry in association with UGC MMTTC HRDC, as a part of its commitment to academic excellence, crafted a refresher course with the theme, "***Comprehensive Chemical Analysis and Characterization in Chemistry***" to cater to the needs of individuals who want to revisit and deepen their understanding of the critical aspects of the said theme. In response to the dynamic scientific research and industry applications, the refresher course tried a comprehensive coverage of topics to equip participants with better understanding in analyzing chemicals through chemical analysis.

Eminent scholars and academicians from Tata Institute of Fundamental Research (TIFR), Indian Institute of technology, Hyderabad (IITH), Indian Institute of science and technology (IICT), National Institute of Technology Warangal (NITW), MS University of Baroda, Birla Institute of Technology and Science (BITS) Hyderabad and Osmania University were invited.

The topics that are covered in this course include:

- Spectroscopic methods such as UV-Vis, IR, NMR, and MS, in identifying and quantifying chemical compounds in elucidating the structure and dynamics of organic compounds and
- Chromatographic Techniques such as GC, and HPLC in separation and quantification of analytes.
- X-ray Diffraction to determine crystal structures.
- Surface Analysis Techniques like X-ray photoelectron spectroscopy (XPS) and scanning electron microscopy (SEM) to understand the composition and morphology of materials at the atomic and nanoscale levels.
- Elemental Analysis such as atomic absorption spectroscopy (AAS) and inductively coupled plasma mass spectrometry (ICP-MS), to quantify the elemental composition of samples.
- Spectral Data Analysis and Interpretation in peak identification, and quantification.
- Evaluation of analytical data and Safety and Laboratory Best Practices

A total of 34 participants from different Universities, Govt Degree colleges, Social welfare and Tribal welfare colleges participated in the refresher course. The 12-day course comprised invited talks, visits to laboratories at IICT, seminar presentations, group project presentations, a minor research project proposal, and a test, culminating in an evaluation process. Participants were equipped with the knowledge and skills necessary to enrich themselves in the ever-evolving field of chemistry. The course not only focused on foundational principles but also addressed emerging trends and real-world applications, ensuring participants are well-prepared for challenges in their careers and research pursuits.

The report provides a comprehensive overview of the lectures, accompanied by a brochure and a calendar of events with titles given by speakers in the last minute, including details about the inaug ural and valedictory sessions.

UGC-MALAVIYA MISSION TEACHER TRAINING CENTRE

(UGC-HUMAN RESOURCE DEVELOPMENT CENTRE)

OSMANIA UNIVERSITY (NAAC WITH A+)

HYDERABAD, TELANGANA STATE

is organising a

Refresher Course in Chemistry

Theme:Comprehensive Chemical Analysis and Characterization

(Offline/Physical mode)

6th to 20th December 2023

About Osmania University

Osmania University, established in 1918, is the seventh oldest in India, the third oldest in South India and the first to be established in the erstwhile princely state of Hyderabad. It has significantly contributed to the academic and economic development of not only the region but also of the Country. It is a multi-faculty and multidisciplinary university, offering rich and varied courses in the fields of Humanities, Arts, Sciences, Social Sciences, Law, Engineering, Technology, Commerce and Business Management, Information Technology and Oriental Languages.

In recognition of its excellent academic achievements, Osmania University had the distinction of being awarded the 'A+' Grade status by the National Accreditation and Assessment Council (NAAC) of the University Grants Commission, Government of India.

About UGC-MMTTC (HRDC)

The UGC-Malaviya Mission Teacher Training Centre (Formarly known as Human Resource Development Centre), Osmania University was established in 1988 (in the first phase of the scheme) and Prof. C.H. Raghuram, was its founder Full time Director. It was renamed as Human Resource Development Centre in the year 2015. It is established as a crucial link between teacher motivation and the quality of education. It was suggested by the National Policy on Education 1986. A new building for Human Resouce Development Centre (HRDC) was inaugurated by Prof.M.Jagadesh Kumar, Chairman, UGC, New Delhi on 10th March 2023. The function of an Human Resource Development Centre is to plan & organise, Faculty Induction Programmes, Refresher Courses, Short Term Courses, Workshops, Webinars for faculty of various Degree Colleges and Universities.

About Department of Chemistry

The Chemistry Department at Osmania University stands as a pillar of academic excellence, defined by its illustrious history, unwavering commitment to research, and a dedicated mission to cultivate future leaders in the field of chemistry. The department derives its strength from the foundational principles laid out by its visionary founders and the nurturing hands of eminent educationists at the inception who laid the platform to bring highest quality education to the reach of one and all. Over the years, it has developed into a thriving academic institution with a rich historical background, placing a strong emphasis on both research and education. The department offers a comprehensive M.Sc. and PhD program with an impressive track record of placing students in various industries with a significant number of students pursuing careers in academia and research.

About Refresher Course

In today's ever-evolving landscape of scientific research and industry applications, it's crucial for professionals and students alike to stay current with the latest developments in chemical analysis and characterization techniques. This refresher course is meticulously crafted to cater to the needs of individuals who want to revisit and deepen their understanding the critical aspects of chemistry. A comprehensive coverage of topics, this refresher course can equip the participants with a well-rounded understanding of chemical analysis and characterization, preparing them to excel in their careers and research endeavors within this dynamic field.

The objectives of the Refresher Course are to:

- ·Educate and update participants' knowledge base in the field of chemical analysis and characterization. by providing a comprehensive overview of the latest techniques, methods, and advancements.
- ·Strengthen participants' ability to apply their knowledge effectively, reinforcing their understanding of key concepts and analytical tools.

Topics to be Covered:

- Introduction to Chemical Analysis and Characterization: Overview of the fundamental concepts and principles of chemical analysis, including the importance of accurate characterization in various scientific and industrial applications.
- Spectroscopy Techniques: Explore various spectroscopic methods such as UV-Vis, IR, NMR, and MS, emphasizing their principles, instrumentation, and applications in identifying and quantifying chemical compounds.
- Chromatographic Techniques: Covers different chromatographic methods, including gas chromatography (GC), liquid chromatography (LC), and high-performance liquid chromatography (HPLC), focusing on separation and quantification of analytes.
- Mass Spectrometry: Dive into the principles and instrumentation of mass spectrometry, discussing ionization techniques, mass analyzers, and applications in identifying and characterizing molecules.
- Nuclear Magnetic Resonance (NMR) Spectroscopy: Provide an in-depth look at NMR spectroscopy, its theory, and its utility in elucidating the structure and dynamics of organic and inorganic compounds.
- X-ray Diffraction (XRD): Introduce participants to X-ray diffraction techniques for determining crystal structures, discussing both powder and single-crystal XRD methods.
- Surface Analysis Techniques: Explore surface characterization techniques like X-ray photoelectron spectroscopy (XPS) and scanning electron microscopy (SEM) to understand the composition and morphology of materials at the atomic and nanoscale levels.
- Elemental Analysis: Discuss methods for elemental analysis, such as atomic absorption spectroscopy (AAS) and inductively coupled plasma mass spectrometry (ICP-MS), used to quantify the elemental composition of samples.
- Data Analysis and Interpretation: Teach participants how to process and interpret analytical data, including methods for spectral and chromatographic data analysis, peak identification, and quantification.
- Quality Control and Assurance: Cover quality control practices, calibration techniques, and the importance of validation and standardization in chemical analysis.
- Emerging Trends: Highlight recent advancements and emerging trends in chemical analysis and characterization, such as the use of artificial intelligence in data analysis, microfluidics, and miniaturized analytical devices.
- Applications Across Industries: Explore real-world applications of chemical analysis and characterization in various industries, including pharmaceuticals, food and beverage, environmental monitoring, materials science, and forensics.
- Safety and Laboratory Best Practices: Emphasize laboratory safety protocols, proper handling of hazardous materials, and adherence to ethical and regulatory guidelines.
- Hands-On Laboratory Sessions: Provide hands-on laboratory sessions where participants can apply their knowledge and skills using state-of-the-art analytical instruments and techniques under expert supervision.
- Case Studies and Problem-Solving: Present case studies and practical problem-solving exercises to challenge participants and reinforce their ability to apply learned concepts.

About the Course Coordinator

Dr. D Annapurna Padmavathi, Professor of Physical Chemistry holds an M.Sc. from Osmania University(1989), a Ph.D from IIT, Bombay(1994). She did short post-doctoral stints at Emory University, Atlanta, U.S.A (1995), and Institute for Molecular Science, Okazaki, Japan (1996). With 23 years of teaching and research experience, she has published 32 research articles. Under her supervision, 2 students have been awarded with their Ph.D., 2 have submitted their thesis and 2 research scholars are pursuing their Ph.D. degrees. She has also completed three minor research projects and co-authored nine chapters in B.Sc chemistry text books. Her research interests are in the fields of physical organic chemistry and theoretical chemistry.

Eligibility

Undergraduate and post-graduate facultyfrom state and central Universities, degree colleges and PG colleges, representing various branchesof Chemistry/Chemical sciences, physical sciences and life sciences are welcome to participate.

Registration fee

The Registration fee for the programme is Rs. 1000/- (Rupees one thousand only) to be paid through online payment mode. (link provided in the registration form).

Certification

The certificates will be issued to the participants on successful completion of the courses meeting the norms such as attendance for all the sessions, completion of assignments, seminar presentations, Group Project Presentations, submission of mini project reports and tests.

How to apply

- The faculty members desirous to participate in the programme are requested to register their details through online mode.
- Filling the online registration form is mandatory.

APPLY NOW

Chief Patron

Prof. D. Ravinder
Hon'ble Vice Chancellor
Osmania University

Course Coordinator

Prof. D. Annapurna Padmavathi
Department of Chemistry
University College of Science
Osmania University.

Facilitators

Prof. Smita C. Pawar
Director

Dr. T. Nagaveni
Associate Director

Dr. B. Sandhya Rani
Assistant Director

Contact: 8331040967 (10.00 AM to 5.00 PM) hrdc@osmania.ac.in

UGC-MMTTC (HRDC)
Osmania University, Hyderabad
Refresher Course in Chemistry (6.12.2023 to 20.12.2023)
Programme sheet – I Week

Date/Day	Session I 10.00 am to 11.30 am		Session 2 11.40 am to 1.10 pm		Session 3 2.00 pm to 3.30 pm		Session 4 3.40 pm to 5.10 pm
6.12.2023 Wednesday	**Inauguration** **Prof V Chandrasekhar** **An Overview of Some Analytical Techniques in Molecular Systems** Centre Director Tata Institute of Fundamental Research Hyderabad Gopanpally, Hyderabad-500046 vc@tifrh.res.in 8143247497	T E A	**Synthesis of carbon nano materials and their various applications** **Dr. P. K. Jain** Scientist "F" & Team Leader Qualification Ph.D. ARCI pkjain@arci.res.in 98494 46456	L U N C H B R E A K	**Thermal techniques I** **&** **Thermal techniques II** **Dr.Ch.Subrahmanyam**, Professor of Chemistry IIT Hyderabad. Kandi 502285, Telangana, INDIA E-mail : csubbu@iith.ac.in. Phone : ++ 91 (040) 2301 6050 9550435527		
7.12.2023 Thursday	**UV Visible Spectroscopy- Basics and Applications** **Jayathirtha Rao Vaidya** Emeritus Scientist: CSIR-Indian Institute of Chemical Technology CSIR-Indian Institute of Chemical Technology jrao@iict.res.in 9866063248		**Mossbauer Spectroscopy** **Dr. M. Vithal** Ph. D, FTAS Professor of Chemistry(Retd.) and CSIR Emeritus Scientist Email ID: mugavithal@gmail.com 9849973868		**Research Methodology** **Dr. M. Vithal** M. Sc., Ph. D, FTAS Professor of Chemistry(Retd.) and CSIR Emeritus Scientist Email ID: mugavithal@gmail.com 9849973868		**Chromatography - Method development and Validation** **Dr T Padmaja, NATCO** Chromatography tapadmaja@gmail.com 9348405065
8.12.2023 Friday	**Normal mode analysis - group Theoretical approach** **Dr Anantha Lakshmi** ananthaprasad2003@yahoo.co.in 9849711487		**Fluorescence Spectroscopy: A sensitive spectroscopic tool for chemical analysis and characterization of solutions and solid-state materials** **Prof. Jayanty Subbalakshmi** Professor, Department of Chemistry BITS-Pilani, Hyderabad Campus Shameerpet Mandal, R.R. Dist Hyderabad- 500078 jslakshmi@hyderabad.bits-pilani.ac.in 9505919741		**ESCA - Electron Spectroscopy for Chemical Analysis – A major tool for Materials Science Research** **Manorama V Sunkara** CSIR-Indian Institute of Chemical Technology manorama@iict.ap.nic.in 9866061347		**ESR** **Prof P Saritha Reddy** University College of Science OU abbareddysaritha@hotmail.com 98484 87363
9.12.2023 Saturday	Holiday (2nd Saturday)				Holiday (2nd Saturday)		
10.12.2023 Holiday	Holiday (Sunday)				Holiday (Sunday)		

Prof. D. Annapurna Padmavathi
Course Coordinator

Dr. T. Nagaveni
Associate Director

Prof. Smita C. Pawar
Director

UGC-MMTTC (HRDC)
Osmania University, Hyderabad
Refresher Course in Chemistry (6.12.2023 to 20.12.2023)
Programme sheet – II Week

Date/Day	Session I 10.00 am to 11.30 am	Session 2 11.40 am to 1.10 pm	Session 3 2.00 pm to 3.30 pm	Session 4 3.40 pm to 5.10 pm
11.12.2023 Monday	**Titrimetry** **Dr Sirisha** University College of Science, Osmania Univ. Hyd berleysiree@gmail.com 93910 21853	**ORD spectra and applications** **Prof. Jalapathi** University College of Science, OsmaniaUniversity	**Seminar evaluations** **1. Prof. Vijaya Charan** Dept. of Chemistry, UCS, OU **2. Dr. T. Gangadhar** Associate Professor, Dept of Chemistry, UCS, OU gangadharchemou@gmail.com 9000234825	**Seminar evaluations** **1. Prof. Vijaya Charan** Dept. of Chemistry, UCS, OU **2. Dr. P. Jalapathi** Professor of Organic Chemistry E-mail: pochampallij@yahoo.co.in; Ph. No. 7386307989; 9848561495
12.12.2023 Tuesday	**1. Identification And Characterization of Molecules To Materials: The Power Of Modern Analytical Chemistry** **2. Application Of Green Chemistry Leading To The Environmental Health And Safety In Our Teaching And Research Laboratories** **Dr. Sudhakar G. Reddy** Sustainability Coordinator(Retd) The University of Michigan, Ann Arbor, Michigan, USA *redv@umich.edu* , 7893079687		**Computational chemistry to predict and understand molecular properties** **Dr Bhanu Prakash** Principle scientist IICT Hyderabd 9491124570 bhanu2505@yahoo.co.in Or bhanuprakashkotamarthi@gmail.com	**Electron Microscopy in Nanomaterial Research: An End User Perspective** **Dr Prakriti Ranjan Bangal** Sr. Principal scientist CSIR IICT Hyderabad prakriti@iict.res.in 94901 19821
13.12.2023 Wednesday	**X-ray Diffraction Techniques and their Applications.** Dr Jagadessh Babu N Principal Scientist IICT HYD *njbabu@iict.res.in* *9441039249*		**Visit to IICT** **XRD/SEM/TEM/XPS/NMR/MASS SEM/TEM/XPS/NMR/MASS** Hands on Session IICT HYD **Prof. B. Yadagiri** **Dept. of Chemistry, UCS, OU**	
14.12.2023 Thursday	**Elemental Analysis Techniques to** **Identify and Quantify The Elemental Composition of Chemical Samples and Compounds** **Dr. R. Krishnamoorthy** rkm.gsi@gmail.com KRISHNAMURTHYdr Lucid Labs [Mobile] 09908220609	**Fundamentals of Raman Spectroscopy and** **Applications** **Prafulla K Jha** Professor of Physics, The M.S. University of Baroda, Vadodara 9825032877	**The Spectroscopic and Computational Characterization of Bio-relevant Molecules** **Dr. Surajit Maity** Associate Professor Department of Chemistry, IIT Hyderabad +91 9182808348 surajitmaity@chy.iith.ac.in	**The Spectroscopic and Computational Characterization of Bio-relevant Molecules** **Dr. Surajit Maity** Associate Professor Department of Chemistry, IIT Hyd Kandi, Sangareddy-502285, TS, In Ph. +91 9182808348 surajitmaity@chy.iith.ac.in
15.12.2023 Friday	**IR and NMR Spectroscopic Techniques** Prof. G. Satyanarayana, IIT-Hyd. Kandi-502284, Sangareddy Telangana, India gvsatya@chy.iith.ac.in		**Role of Mass Spectrometry in the Analysis of Verities Molecules** T Jagadeeshwar Reddy, Principal Scientist IICT HYD tireddy@iict.res.in Jagadeesh NCMS +91 89535 63333	
16.12.2023 Saturday	**Lessons Learned from the Deep Seated** **Prof HSP Rao** profhspr@gmail.com	**Analytical Techniques in the Pharma Industry** **Dr A Veera Reddy** Technical Director, Srinivasa Labs (M):9392483004reddyvenis@rediffmail.com	**Understanding the Surface-Active Sites by Adsorption and Spectroscopic Techniques** **Dr A Venugopal** CSIR IICT akula@iict.res.in 94432 64222	**Overview of Chromatographic Techniques** **Dr Ashok;** Reddy labs +91 99590 96681ashoks@drreddys.com

Prof. D.Annapurna Padmavathi
Course Coordinator

Dr. T. Nagaveni
Associate Director

Prof. Smita C. Pawar
Director

UGC-MMTTC (HRDC)
Osmania University, Hyderabad
Refresher Course in Chemistry (6.12.2023 to 20.12.2023) Programme sheet – II Week

Date/Day	Session I 10.00 am to 11.30 am		Session 2 11.40 am to 1.10 pm		Session 3 2.00 pm to 3.30 pm		Session 4 3.40 pm to 5.10 pm
18.12.2023 Monday	**Spectral Analysis** Prof P Leelavathi UCS OU leelaou@gmail.com 9440621313			LUNCH BREAK	**Group project evaluations** Dr. P. Vijay Kumar Prof. of Organic Chemistry UCS, OU kumar4vijay@yahoo.com Dr. M. VithalDr. M. Vithal FTAS Professor of Chemistry(Retd.)	TEA	**Group project evaluations** Dr. P. Vijay Kumar Prof. of Organic Chemistry UCS, OU Kumar4vijay@yahoo.com Dr. Someshwar Pola Dept. of Chemistry, UCS, OU
19.12.2023 Tuesday	**Electroanalytical Techniques** Prof. Naredra Kurra narendra@chy.iith.ac.in IITH Kandi-502284, Sangareddy Telangana, India 8688345847				**Characterisation of Catalysts** Dr A H Padmasri ahpadmasri@gmail.com 9441788898		**Test**
20.12.2023 Wednesday	**Need for Safety Culture in the Academia** **Dr. K Babu Rao**, Retired Chief Scientist, IICT, Hyderabad +91 94911 16543 brkalapala@gmail.com		**Evaluation of Analytical Data** **Dr Raghu** NIT Warangal 8290529060 raghuchitta@nitw.ac.in		**Computational design and synthesis of novel drug like molecules** **Prof. M. Vijjulatha** Vice Chancellor Telangana Mahila Viswavidhyalayam Koti, Hyderabad		**Valedictory** **Chief Guest** ***Prof. M. Vijjulatha*** Vice Chancellor Telangana Mahila Viswavidhyalaya Koti, Hyderabad

Prof. D.Annapurna Padmavathi
Course Coordinator

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Prof. Smita C. Pawar
Director

INAUGURAL SESSION

A GLIMPSE OF FEW TALKS

The **Refresher Course in Chemistry** with the Theme "**Comprehensive Chemical Analysis and Characterization"** commenced on **6th Dec 2023** at UGC-MMTTC (HRDC) with an inaugural, by formally welcoming the Key Note Speaker *Professor V Chandrasekhar*, Center Director TIFR, Hyderabad, *Professor Smita C Pawar* the Director UGC-MMTTC (HRDC), the course coordinator *Professor D Annapurna Padmavathi* from Dept. of Chemistry, University College of Science, Osmania University and the participants by the Associate Director, Dr T Nagaveni UGC-MMTTC (HRDC).

Professor Smita C Pawar, the Director UGC-MMTTC (HRDC) provided opening remarks, outlining the course criteria and program details. The course coordinator Professor D Annapurna Padmavathi, then presented the objectives, and the theme of the refresher course as to educate, update and strengthen participants knowledge base by providing a comprehensive overview of the latest techniques, characterization methods, and advancements in the field of chemical analysis.

Professor V. Chandrasekhar an academician par excellence delivered key note lecture on the topic **An Overview of Some Analytical Techniques in Molecular Systems**. He highlighted that one of the chief contributors to the rapid progress in science in the last few decades has been the advancement of sophisticated tools that enable us to know more about matter. Most of these are based on light-matter interaction and have evolved now into a battery of powerful analytical techniques each complementing the other and enabling as near a complete picture as can be inferred about the structural details of molecules/materials. He gave an overview on the basic concepts in various spectroscopic Techniques of Molecular Analysis such as microwave, IR, NMR spectroscopic Techniques by emphasizing the research in chemical sciences and on the use of multinuclear NMR for probing the structures of main-group organometallic compounds.

The inaugural session concluded with formal felicitation and a vote of thanks from the Associate Director, Dr T Nagaveni, UGC-MMTTC (HRDC).

The refresher course comprised of four technical sessions everyday, divided into two pre-lunch sessions and two post-lunch sessions. The subsequent session was led by *Dr. P. K. Jain*, Scientist "F" & Team Leader ARCI. He focused on **Synthesis of carbon nano materials and their various applications**. The speaker took all the participants through a virtual tour of ARCI and insisted that the participants should take motivation from Nature. He emphasized that the unique characteristics of Carbon make it versatile for many applications ranging from households to high tech aerospace, defense, nuclear energy and new energy source program on the other. Dr Jain shed light on material nanotechnology applications, textile engineering, textile coating, synthesis etc.

Later, in the afternoon session *Dr. Ch. Subrahmanyam*, Professor of Chemistry, IIT Hyderabad delved extensively into **Thermal techniques**. His presentation focused on diverse approaches, methodologies, applications, and potential sources of error within these techniques. The discussion included detail insights into Thermograms, elucidating topics such as Thermal Gravimetric Analysis such as TGA and Differential Scanning Calorimetry (DSC). Using various examples, he clarified concepts related to thermal degradation processes, heat capacity, polymer characterization, and kinetics.

On **Day 2** the 7th Dec, 2023, the session was led by *Dr Vaidya JAYATHIRTHA RAO,* Emeritus Scientist at IICT-HYD and Honorary Professor AcSIR on the topic "**UV-Visible Spectroscopy and its Applications**" . He began with an introduction to the absorption of Ultraviolet-Visible radiation by matter and the methods of measuring absorbed radiation by molecules in various states, including the solution state, film state, opaque state, powder state and solid state. Limitations to Beer-Lamberts law and spectral curves were extensively discussed in the analysis of UV-Vis absorption spectra.

The second and third sessions were conducted by *Prof. M. Vithal,* CSIR Emeritus Scientist, from UCS-OU covering the topics of **Research methodology & Mossbauer Spectroscopy**. In the first session of his talk, Prof Vitthal emphasized on various steps involved in research methodology, starting with choosing a research problem and extending to the award of a doctoral degree. He concluded the session by listing various funding agencies across the country. The second session focused on Mossbauer spectroscopy, where Professor explained all the applications in a precise and nut shell form, covering the rarely used spectroscopy.

The last session was by *Dr. N Padmaja* from NATCO Pharma, Hyderabad on **Chromatography - Method development and Validation** about High performance liquid chromatography (HPLC) the essential analytical tool in assessing drug product. Dr Padmaja explained HPLC instrumentation, and methods to separate, detect and quantify drugs and drug-related impurities during synthesis. She provided clear explanations of method development and method validation techniques, elucidating how a robust method is developed in pharmaceutical companies and its role in purity calculation of a drug.

Day 3 Session on 8th Dec, 2023 was initiated by the invited speaker, *Prof. P V. Anantha Lakshmi,* Professor of Chemistry, OU on **Normal mode Analyses – A Group theoretical approach**. Professor Anantha Lakshmi explained the basics of Symmetry Elements to advanced group theory calculations. She enlightened the participants on how to calculate IR and Raman active modes through Cartesian Coordinate method and Internal coordinate method, using simple molecules like H_2O and NH_3.

The second session was by *Prof. Jayanty Subbalakshmi*, Dept. of Chemistry, BTS-Pilani,Hyderabad division who enthrailed the audience with **fluorescence spectroscopy**. She explained the basic principles of fluorescence spectroscopy and its utilization in the characterization and comparative analysis of solutions and solid-state molecular materials, focusing on aspects like sensing, aggregation, metal-ion complexation, bio-imaging, etc. She emphasized how fluorescence spectroscopy stands out due to its utmost sensitivity.

The third session was by *Dr Sunkara-Vardhireddy Manorama* from the Nanomaterials Laboratory, CSIR-IICT, on **ESCA - Electron Spectroscopy for Chemical Analysis – A major tool for Materials Science Research**. Dr Manorama exclaimed that, among the various characterization techniques, ESCA has gained a lot of importance because of the significant role it plays in understanding phenomena, helping design novel and better performing materials. She explained the progress in instrumentation and associated soft-ware development, making the technique more convenient and user friendly. Dr. Manorama detailed the principle behind ESCA, the information that could be obtained, the experimental procedure, data analysis and interpretation of the results. A few cases from research in their group was presented to show case and highlight the importance of the highly sophisticated but simple analytical technique.

The fourth session on the third day of refresher course on 8th Dec 2023 covered **ESR Spectroscopy** by *Professor P Sarita Reddy* from UCS-OU. She explained about the components of ESR spectrometer, presentation of spectrum, spectral parameters, ESR spectrum of H-atom, methyl radical, Vanadyl acetylacetanato. She also explained selection rules, hyperfine splitting, superhyperfine splitting, zero field splitting, breakdown of selection rule, g-value, factors affecting g-value and ESR applications.

Day 4, the 11th of December 2023, started with *Prof B Sireesha* from University College of Science (UCS), Osmania University, conducting a session on **Titrimetry**. She introduced the topic, explaining in detail the types of titrations, requirements, precautions to be taken, and theories of indicators and their applications.

The second session was on **Optical Rotatory Dispersion (ORD) Spectroscopy Principles And Applications** by *Prof. P Jalapathi* from Chemistry Department UCS-OU.

Third and fourth sessions were on seminar evaluations. All participants delivered a 5 min presentation on structural elucidation using various techniques such as NMR, SEM, TEM, HPLC, retrosynthesis, emphasizing the importance of accurate characterization is crucial in science and industry. Topics included mass, ion exchange chromatography, water treatment etc. *Prof P Vijayacharan*, *Professor P Jalapathi* and *Dr T Gangadhar* from Chemistry department UCS-OU evaluated the seminar presentations.

The session on **5th day** began with *Dr. Sudhakar Reddy*, a Lab Director/ Campus Sustainability Coordinator from the University of Michigan, USA, delivering two lectures. The first one focused on **application of green and sustainable practices leading to the environmental health and safety in our teaching and research laboratories**. The second lecture was on **Identification and characterization of molecules to materials: the power of modern analytical chemistry**. Dr Sudhakar Reddy clearly explained how to work safely in chemistry labs, covering topics such as chemical hygiene plans, chemical, Physical and biological hazards, safety protocols, spills & accident prevention, and the construction of a sustainable lab. He also discussed the concepts like reuse program, atom economy, source reduction, micro scale chemistry and concluded with safer alternatives. In the second session, Dr Reddy started by explaining the steps involved in identification methods and various types of labs. Later, he delved into real-life problems and provided solutions.

The third session was by **Dr. K Bhanu Prakash**, Principal Scientist, IICT-Hyd, on the topic **Computational chemistry to predict and understand molecular properties**. He explained how the advent of computers made life easier and provided insights into different software used to calculate thermodynamic parameters using quantum mechanics, citing examples from his work.

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Later, in the last session of the day, Dr Prakriti Ranjan Bangal, Principal Scientist from IICT, spoke about **Electron Microscopy in Nanomaterial Research: An End User Perspective**. Dr Bangal initiated the session with an introduction of various types of optical microscopes, which later extended to electron microscopes such as SEM and TEM. He explained the principles involved in SEM and TEM, Components of Electron microscopes, different types of electron guns, types of detectors, ESEM, sample preparation for SEM, TEM and Image analysis. The session concluded with an overview of the wide applications of SEM and TEM.

On the **6th day** the 13th of December 2023, the morning sessions were by Dr Jagadeesh Nanubolu a Senior Principal Scientist from IICT Hyd on **X-ray diffraction techniques and their applications**. Dr Jagadeesh delivered an excellent talk, starting with an Introduction to solid forms. He covered a comparative study of Diffraction Single Crystal with Powder X-ray Diffraction (PXRD) technique and its applications, including Phase Identification, Indexing, Quantifications, Rietveld analysis, Nanoparticle characterization, Degree of Crystallinity, Formulations, Stability studies, single crystal X-ray Diffraction (SCXRD) and its applications, Structure determination, Stereochemistry, Absolute configurations, Bonding and Structure revisions.

Following the morning sessions there was a visit to IICT in the afternoon, allowing participants to observe XRD, NMR, MASS spectrometers and HPLC. Additionally, they had the opportunity to explore MolBank, a repository of molecules and observe the scaling up of synthesis from bench to large scale production.

Visit to IICT Hyderabad

On the **seventh day** of the refresher course on Decemnber 14, 2023, the first session's focus was on **Elemental analysis techniques to identify and quantify the elemental composition of chemical samples**. Dr R Krishna Moorthy, retired Director General of NGRI, Hyderabad current working at LUCID Labs, provided comprehensive information on the types of elemental analysis, including quality standards, analytical tests, atomic absorption methods and elemental analysis.

The second session on the same day was an online session on Fundamentals of Raman Spectroscopy and applications by Prafulla K Jha, Professor of Physics, The M.S. University of Baroda, Vadodara. Professor Jha covered various applications of Raman in a detailed manner.

The afternoon session by *Dr. Surajit Maity*, Associate Professor from IITH, covered **The Spectroscopic and Computational Characterization of Bio-relevant Molecules**. Dr. Maity, explained the benefits of combining experimental and computational data in characterizing chemical systems. He emphasized the need for computational validation in assigning molecular structures and measuring accurate energy barriers for experimentalists. The computational chemists require benchmark data to validate methods to predict the interaction energies, perform spectral simulations, predict band assignments, and understanding the normal modes and their roles in chemical reactions. The discussion delved into theoretical backgrounds, experimental tools of spectroscopic methods (vibrational and electronic), appropriate computational methods to characterize biomolecular systems in session 1, while Session 2 explored combined experimental and computational investigations to understand structures, energetics and reactions were discussed.

On **8th day** the 15th Dec, 2023, the morning session was by Prof G Satyanarayana from IIT H , focusing on **IR spectroscopic technique**. Prof Satyanarayana introduced various spectroscopic methods like UV, IR, Mass and NMR. He then discussed topics like degrees of freedom, Vibrational Coupling, Overtones, combination bandy, Finger print region, Fermi Resonance, IR Instrumentation, and specific examples included IR spectroscopy of C_2H_5OH, Vanillin, M-methyl aniline etc.

The afternoon session covered the **Role of mass spectrometry in the analysis of verities molecules**, led by Dr T Jagadeeshwar Reddy, Principal Scientist, IICT. Dr Reddy started his lecture with application of mass spectrometry, instrumentation and the advantages of mass spectrometry. In the first session, he explained techniques and ions produced in mass spectrometry such as EI, CI, ESS, MALDI, APCI. paper spray and leaf spray analysis, and detectors. In the second session, Dr Reddy discussed 2D, 3D, 4D techniques, representation of low resolution MS Spectrum, HRMS, tandem mass spectrometry and mass spectrometry for proteomics.

On **9th day** the 16th Dec2023, the session commenced with the story of camphor presented by Prof H Surya Prakash Rao, a senior retired Professor from Pondicherry University currently serving as the Director and Scientific Adviser, at Teadus Pharma Pvt. Ltd. He discussed the lessons learnt from nature, using camphor as an example- covering its occurrence, isolation, , synthesis of camphor via Diels-Alder reaction, Biosynthesis of camphor, NMR, 2D NMR spectral data of camphor and its structure elucidation.

The second session was by *Dr A V Reddy*, Technical Director at Srinivasa Labs, who provided detailed insights into **Analytical Techniques in the Pharma Industry**. Dr Reddy explained aspects such as drug testing, IR spectral loss on drying, changes in residue on ignition, optical rotation, certification of drug analysis. forced degradation studies, gas chromatography for separation of isomers, various stationary phases, types of detectors, normal phase, reverse phase HPLC, as well as instrumentation and applications of GC-MS, LC-MS and HPLC.

In the third session, *Dr A Venugopal*, Chief Scientist, IICT-Hyd, discussed about **Understanding the Surface-Active Sites by Adsorption and Spectroscopic Techniques**. He emphasized the role of catalysis in the chemical conversion, spanning applications from pharma to space research. Dr Venugopal highlighted the importance of identifying surface-active sites for achieving high selectivity in product outcomes, considering environmental and economic perspectives. The talk delved into rationalization bulk and surface sites using coupled techniques, including adsorption techniques such as BET-SA, surface acid-base strengths, metal dispersion and spectroscopic techniques. These methods contribute to understanding the role of acid-base (Bronsted-Lewis) metal sites in producing renewable fuels and chemicals.

The fourth session by *Dr Ashok* from Reddy Labs, provided an **Overview of Chromatographic techniques – application in pharma industry**. Dr. Ashok began by explaining chemical analysis in the pharmaceutical industry, covering synthesis, evaluation, challenges faced in pharma industry, choosing analytical technique in synthesis, resolution of enantiomers. He also highlighted the differences in and explained about differences in chemical analysis between academia and industry.

On **10th day**, the 18th Dec, 2023, the session began with Prof P Leelavathi delving into the realm of **spectral analysis**. *Prof P Leelavathi* provided insights into deciphering structure of the compound through UV, IR, NMR and Mass spectral techniques. Using an interactive teaching style, she addressed and solved several problems engaging the students in the process. Subsequently she assigned problems for the participants to solve and provided few more for their personal exercise.

The third and fourth sessions were on group project evaluations, with a total of 11 groups, each consisting of a minimum of three participants. All groups delivered a 15 min presentation on various research areas. *Prof M Vitthal, Professor P Vijay Kumar and Professor P Someshwar* from Chemistry department UCS-OU evaluated the group project presentations.

At the same time all the participants were asked to submit project proposals. The project proposals of participants were evaluated by *Professor M Vitthal and Professor P Leelavathi*.

On **11th day** the 19th Dec, 2023, in the morning sessions Dr. Narendra Kurra from the Department of Chemistry, IITH covered various aspects related to the topic electroanalytical techniques. He started his session with various types of electrodes, Nernst equation, and the sensors including molecular and biosensors He then continued with conventional voltametric techniques such as linear sweep voltammetry, cycling voltammetry and electrochemical impedance techniques. He also provided basics on supercapacitors, their operating mechanisms, evolution of capacitor technologies and real life applications.

In the afternoon's first session, *Professor A H Padmasri* from Osmania University spoke about **Characterization of Catalysts**. She gave a detailed account of characterization of heterogeneous catalysts based on their surface reactions, reusability and applicability with special emphasis on Hydrotalcites and metal organic frame works.

In the last session, a test was conducted on the theme, "***Comprehensive Chemical Analysis and Characterization in Chemistry***" of the refresher as a part of the evaluation. All the participants went through all the 4 different modes of evaluation.

On **12th day** the 20th Dec, 2023 the session commenced with Dr Babu Rao Garu an eminent environmentalist from IICT Hyd speaking about **Need for safely culture in Academia -Practice Science Safely**. Dr Babu Rao explained the significance of safety culture in laboratories. He focused in topics like toxicity, hazard, chemical pollution, process safely management system (PSMS), Material safety data sheet (MSDS), handling of hazardous chemicals such as reactive and toxic chemicals, fume hoods, standards, regulations, good work practices and disposal of chemicals with many examples.

The second session was on **Evaluation of Analytical Data** by Associate Professor Dr Raghu C, NIT Warangal. Dr Raghu spoke on the evaluation process, the analytical methods used, and the specific objectives of the analysis. He also covered characterizing measurements and results, experimental errors, propagation of uncertainty, the distribution of measurements and results, statistical analysis of data, detection limits etc.

The third session was an invited talk by Professor M Vijjulatha, Vice-chancellor, Telangana Mahila Vishwavidyalaya on **computational design and synthesis of novel drug like molecules**. She explained molecular docking, ligand-based drug design and structure-based drug design of novel molecules with a high potency towards inhibition of HIV-1, with special focus on non-trivial proteins. She also spoke about the inhibition of proteins involved in signaling and transduction, DNA synthesis.

The fourth session of refresher course in Chemistry concluded with the valedictory session. Professor M Vijjulatha Vice-chancellor, Telangana Mahila Vishwavidyalaya, was the chief guest, and the guest of honor was Professor Umesh Kumar Chair person Board of studies, Osmania University.

The valedictory of the Refresher Course in Chemistry started with a formal welcome of the chief guest Professor M Vijjulatha, Vice-chancellor, Telangana Mahila Viswavidyalaya, Guest of honor Professor Umesh Kumar Chair person Board of studies, Osmania University, Professor Smita C Pawar, the Director UGC-MMTTC (HRDC), the course coordinator Professor D Annapurna Padmavathi from Dept. of Chemistry, University College of Science, Osmania University and the participants by the Associate Director, Dr T Nagaveni UGC-MMTTC (HRDC).

The course coordinator Professor D Annapurna Padmavathi presented the topics that were covered by various academicians and scientists during the 12-day refresher course. Out of 34 Participants 4 were awarded with A+ and rest with A. She said it was indeed an enriching experience to everyone involved. The sessions were very involved by the passionate leaders of chemical sciences. She expressed her gratitude to the learned scholars who took time off from their busy schedules to disseminate knowledge to the upcoming of scholars in the course to carry the legacy forward.

Professor M Vijjulatha, Vice-chancellor, Telangana Mahila Viswavidyalaya and Professor Umesh Kumar Chair person Board of studies, Osmania University gave their remarks about the course.

Professor Smita C Pawar, the Director UGC-MMTTC (HRDC), gave her presidential remarks by giving a brief note on the conduction of the 12 day refresher program in Chemistry.

A formal felicitation to the Chief Guest and Guest of honor, acknowledging their presence and expressing gratitude for their participation was done by the dignitaries followed by distribution of certificates to participants. The valedictory session concluded with vote of thanks by the Associate Director, Dr T Nagaveni, UGC-MMTTC (HRDC).

PHOTO SESSION





VALEDICTORY FUNCTION

VALEDICTORY FUNCTION