HRDC, Pt. Ravishankar Shukla University, Raipur (C.G.)
Online Refresher Course in Chemistry
Theme: Recent Trends in Teaching and Research in Chemistry
September 14-26, 2020

REPORT

The online refresher course in Chemistry was organized successfully during **September 14-26, 2020** under the aegis of Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur. The main theme was "**Recent Trends of Teaching and Research Chemistry".** This course was formulated keeping in view the need to strengthen chemistry program in the undergraduate and postgraduates levels in the country. Special emphasis has been given to design a variety of interesting and meaningful topics which would be useful for all the Chemistry teachers irrespective of their specializations. In addition to that New Roles of teachers in technology driven higher education and research ethics have also been covered.

36 teachers from 7 states, Chhattisgarh, West Bengal, Maharasthra, Kerala, Jharkhand, Kashmir and Uttarakhand have attended this course. **21** resource persons delivered **37** lectures **(Please see Annexure I)**. Each day was started with a lecture by a resource person giving a brief outline of their research activities followed by the fundamental details of their respective topics. Some of the important topics like Quantum Statistics and Quantum Mechanics, Atomic Structure, Phase rule, Molecular organization, Solid State Chemistry , Linearfree energy relationship. Role of Bulk and Trace Metals in Human Body,Chemistry – For Healthy Future Structure Directed Delivery : Design ofCoordination Polymers (CPs) or Metal Organic Frameworks (MOFs) Optical Sensing Platforms: Opportunities and Challenges, Environmental Atmospheric Chemistry, imperfections in solids Nanomaterials and Spectroscopy have been covered. The daily activity report is enclosed **(Annexure -II)**. All the resource persons were strongly interacted with the participants.

The course began with a welcome address by the Director HRDC, Prof. A K Gupta. He discussed about the policies of HRDC and other important aspects of this on line refresher course. Course coordinator, Prof. Kallol K Ghosh briefly outlined the framework of the course and importance of this course in the context of New Education Policy. Hon'ble Vice-Chancellor of Pt. Ravishankar Shukla University Prof. Keshari Lal Verma presented his views on the refresher course.

He emphasized on knowledge economy and role of higher education for the overall development, prosperity and quality of life. According to him during this Covid-19 pandemic problem these online initiatives are surely going to help and enrich and empower the teaching and research activities of all the stakeholders of higher education. The distinguished guest Prof. A K Bakhshi, Vice Chancellor PDM University and Chairman National Resource Centre Chemistry discussed about the recent trends in chemistry teaching and research. Dr. Bhanushree Gupta of Centre for Basic Sciences proposed vote of thanks and conducted the program.

All the participants enthusiastically participated in the various activities conducted like Microteaching, Seminar and Research Project presentation (Annexure **III, IV and V).**The Participants of this Refresher Course also gave their Feedback on the format prescribed by the HRDC. Besides, the Participants provided the general Feedback about the course during various presentations and the Valedictory Function. They opined that this unique online course refreshed their knowledge and motivated them to be aware of the recent trends of research and teaching in the field of chemical sciences. They also appreciated the theme and proper selection of renowned academicians and experts.

On the concluding day of refresher course Prof. Kallol Ghosh, Course Coordinator, Refresher Course presented the report for the course. He discussed the various facets of the lectures delivered. He expressed satisfaction over the performances of the participants in regards to microteaching, seminars, project presentations and test. He expressed sincere gratitude to HRDC and Director, Asst. Director, Dr. Arvind Agrawal , Dr. Bhanushree Gupta and Ms. Srishti Sharma for their co-operation and university as a whole. After this Prof. A. K Gupta in his concluding remark congratulated HRDC in-general and Prof. Kallol K. Ghosh and his team in particular for successfully organizing the course. He wished good luck to the entire participant for future work. Finally, Prof. Keshari Lal Verma, Vice-chancellor, Pt. Ravishankar Shukla University Raipur addressed online assembly. Prof Verma expressed his satisfaction after hearing the feedback of participants for the course and congratulated them for choosing Pt. Ravishankar Shukla University Raipur for refresher course.

Annexure -I

Online Refresher Course in Chemistry

HRDC, Pt. Ravishankar Shukla University, Raipur

September 14-26, 2020

S. No.	Name of the Resource Person	Address	Title of the Lecture
1.	**Prof. A. K. Bakhshi** Vice Chancellor, PDM University, Bahadurgarh, Haryana. Chairman, National Resource Centre of Chemistry of MHRD	akbakhshi2000@yahoo.com; **M: 08826676577**	Towards Excellence in Chemistry in India in the 21st Century : Some Useful Tips
2.	**Prof. D. C. Mukherjee** Retd. Professor of Chemistry, University of Kolkata, Kolkata	dcm_chem@yahoo.co.in **M: 9007009171**	Genesis of Quantum Statistics and Quantum Mechanics (Two lectures)
3.	**Prof. S. K. Mehta** *Department of Chemistry, Panjab University, Chandigarh*	skmehta@pu.ac.in **M: 9417786061**	1. Quality research at higher education Institutions: Initiative and promotion 2. Significance of Ethics in Research
4.	**Prof. R. D. Kaushik** Head, Department of Chemistry, GurukulKangri University, *Haridwar*	rduttkaushik@yahoo.co.in; **M: 7351739000**	1.Linear Free Energy Relationships 2.S/N Ratio, Sensitivity, Detection limit, Types and Reduction of Noise, Basic Idea of FT
5.	**Prof. R. N. Prasad** Senior Advisor & Dean, Faculty of Science, JECRC University, *Jaipur, Rajasthan*	rnp_1949@yahoo.co.in; **M: 098282 48078**	Role of Bulk and Trace Metals in Human Body (Two Lectures)
6.	**Prof. C. R. Sinha** Head, Department of Chemistry, Jadavpur University, Kolkata	crsjuchem@gmail.com; **M: 9433621872/ 7044231277**	1.Chemistry –For Healthy Future 2. Structure Directed Delivery : Design of Coordination Polymers (CPs) or Metal Organic Frameworks (MOFs)
7.	**Prof. Goutam Patra** Department of Chemistry, GuruGhasidasVishwavidyalaya, *Bilaspur*	patragoutam137@gmail.com; **M: 8910136164**	1. (a) Optical Sensing Platforms: Opportunities and Challenges (b)A Tribute to Acharya PC Ray: Father of Indian Chemistry
8.	**Prof. Pramila Misra** *Department of Chemistry, Sambalpur* University, Sambalpur, Odisha	pramilamisra@rediffmail.com; **M: 9938333244**	Construction of the phase diagram of one, two and three component systems
9.	**Prof. B. K. Mishra** *Professor of Chemistry (Retd,), Sambalpur* University, Sambalpur, Odisha	bijaym@hotmail.com; **M: 9861046813**	Molecular Organizations (Three lectures)

10.	**Prof. A. P. Mishra** Department of Chemistry, Dr. H. S. Gour University, *Sagar, M.P.*	apmishrasagar@gmail.com; **M: 9425425938**	Chemistry at the Interface with biology. 1. Bioinorganic Chemistry : Metal ions in Biology 2. Metal Chelates in Medicine: Practices and Prospects
11.	**Prof. Ram Sagar Misra** Department of Chemistry, Banaras Hindu University, Varanasi	ramsagar.bhu@gmail.com; **M: 9971119402**	1.Stereoselective Synthesis of Natural Product Inspired CarbohydridsasAntiproliferative Agents 3. Intervention in plant signalling through light-activation of an exogenous sugar signalling-precursor increases yield and resilience in wheat crop.
12.	**Dr. Anjali Pal** Department of Civil Engineering, Indian Institute of Technology, Kharagpur,W.B	anjalipal@civil.iitkgp.ac.in, **M: 9474448946**	Recovery and reuse of organic and inorganic pollutants and their further application towards catalyst development (Two Lectures)
13.	**Prof. Tarasankar Pal** Professor of Chemistry (Retd.), Indian Institute of Technology, Kharagpur,W.B	tarasankar.pal@gmail.com; **M: 9434342349**	1. Reactions of Metals in Aqueous Solutions 2. A stimulating Phosphomolybdate-Dye Matrix for Chromism and Nitrogen Oxygen Binding
14.	**Dr. (Mrs.) Vimal Rarh** Coordinator, National Resource Centre of Chemistry, MHRD Project Head & Joint Director, Guru AngadDev Teaching Learning Centre of MHRD Deputy Director, Centre for e-Learning, SGTB Khalsa College, University of Delhi, Delhi	vimalrarh@gmail.com; **M: 9810094703**	1.New Roles of Teachers in Technology Driven Higher Education. 2.Development of OERs for Blended and Flipped Classroom Teaching
15.	**Prof. Manas Kanti Deb** School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, C.G	debmanas@yahoo.com **M: 94255-03750**	1.Atmospheric Chemistry: Fundamental Aspects 2.Atmospheric Chemistry: Analytical Aspects
16.	**Prof. Shamsh Pervez** Head, School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, C.G	shamshpervez@gmail.com; **M: 9425242455**	Air Quality Monitoring, Assessment , and Management
17.	**Prof. Anand S. Aswar** Head, Department of Chemistry, SantGadge Baba *Amravati* University, *Amravati , MH*	aswaranand@gmail.com; **M: 9421790866**	Imperfections in solids (Two Lectures)
18.	**Dr. Kamlesh Shrivas** School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur	kshrivas@gmail.com **M:7999926856**	1.UV-Vis: Basic Instrumentation and Application in Chemical Analysis" 2.Surface and Materials Characterization Techniques

19.	**Prof. Amiya K. Panda** Department of Chemistry, Vidyasagar University Midnapur , WB	**akpanda@mail.vidyasagar.ac.in** **M:9433347210**	A Cursory Glance on Colloid and Interface Science with Special Reference to Nanoparticles
20.	**Prof. Sanjiv Kumar** Professor in Physical Chemistry, School of Sciences, Indira Gandhi National Open University, MaidanGarhi, N. Delhi	**sanjiv_sos@ignou.ac.in; Sanjiv685@yahoo.com** **M: 9810473149**	1."Electronic Structure of Atom: Conceptual Development" 2.NMR spectroscopy: principle and applications"
21.	**Prof. K. S. Patel** **Retd. Professor,** S.o.S. in Chemistry, Pt. Ravishankar University, Raipur Present Address: AMITY University, Raipur	**patelks_55@hotmail.com** **M: 9993013290**	Water Pollution and Health Hazard

Annexure -II

Online Refresher Course in Chemistry

HRDC, Pt. Ravishankar Shukla University, Raipur

September 14-26, 2020

(Daily Activity Report)

Human Resource Development Centre

Pt. Ravishankar Shukla University Raipur, Chhattisgarh

Online Refresher Course in Chemistry

Refresher Course: New Trends of Teaching and Research In Chemistry

14th September to 26th September 2020

Lecture Title: "Towards Excellence in Chemistry in India in the 21st Century: Some Useful Tips" (Monday, September 14, 2021, 12:15AM -13:45 PM)
Speaker: Prof. A. K. Bakhshi

For the Financial Year 2020-2021, UGC has sanctioned Nine Refresher Courses. The Refresher Course in Chemistry for College and University Teachers was the fourth in the series of nine and it was inaugurated on 14.09.2010, at 10:30 am via online Google meet platform. Forty participants had registered for the Programme across the country. In the Inaugural Session, Prof A.K. Gupta, Director, HRDC, Pt. Ravishankar Shukla University Raipur, welcomed the gathering. Prof. A. K. Bakhshi Vice Chancellor, PDM University, Bahadurgarh, Haryana. Chairman, National Resource Centre of Chemistry of MHRD, inaugurated the Course, Prof K.L. Verma Vice Chancellor Pt. Ravishankar Shukla University Raipur, delivered the keynote Address. Prof Kallol Ghosh (Course Coordinator) explained the Theme of the Course, "New trends of Teaching and Research in Chemistry". He also underlined the duties and responsibilities of teachers to update themselves in their areas of specialization. After the completion of inaugural session first technical session was started with the lecture of Prof. A.K. Bakhshi, Vice Chancellor, PDM University, Bahadurgarh, Haryana. In his inspiring lecture Prof. A.K Bakhshi introduced the challenge in teaching and Research in Chemistry subject with its own growth. He described transformation of teaching and learning from talk and chalk method to techno savvy ICT methods. Prof. Bakhshi motivated the teachers to upgrade their learning attitude via online courses through MOOC, Swayam, ARPIT, e-PG Pathshala etc. He nicely explained the concept of basic clarity with out of box thinking with quantum mechanics examples. Moreover, He added the Combinations of 4Cs Curious, Creative, Courageous, Commitment need to be added in the researchers and teachers' attitude. He pointed out the significance of Communication and Presentation Skills in Carrier growth with carrier development. The session was designed around the theme to empower, enrich and upgrade the teaching, learning and research aptitude of participants. The lecture covered seven most widely explained topics for being outstanding teacher and researcher's

- Clarity of concept and sound knowledge, out of box thinking aptitude

Human Resource Development Centre

Pt. Ravishankar Shukla University Raipur, Chhattisgarh

- Talk to chalk to ICT techniques in Chemistry teaching
- Qualities for being Outstanding Teachers and Researchers with 4Cs
- Carrier management: Carrier Growth and Carrier Development
- Need to Reform in Chemistry Education: Focus on activity-based learning
- Science Education in India:
- Common Misconceptions in Chemistry

Report Submitted by

Archana Asatkar
Asst. Professor, Chemistry Shaheed Veer Narayan
Singh Govt College Jobi-Barra
Dist. Raigarh. CG. -496665

Report on Lecture Session

Name of the Event: Lecture session on selected topic (Lecture No 03 & 04)

Date of Event: September 14, 2020

Time: 2: 15 pm – 5:30pm)

Location of Event: HRDC, Pt. Ravishankar Shukla university, Raipur

Resource Persons:

(1) Prof. T. S. Pal

Distinguished visiting professor in the University of Johannesburg, South Africa.

(2) Professor M. K. Deb

School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur (C.G.).

Session Chair: Dr. Saugata Konar

First of all, I would like to thank respected director of HRDC, Prof. A. K. Gupta, & coordinator of this Online Refresher Course (ORC) Prof. K. K. Ghosh, for giving me the opportunity to participate this ORC in Chemistry and to be the Rapporter of **IInd** session today (Lecture No 03 & 04).

Lecture session was started at 2:15 pm. Dr. Saugata Konar chaired the session and introduced both speakers.

In 1st lecture Professor Tarasankar Pal, distinguished visiting professor in the University of Johannesburg, South Africa. Professor Tarasankar Pal introduced the participants to the behavior of pure metals in solution discussed in the presentation. He introduced pure and impure metals in his lecture. He discussed how to work under normal condition of redox phenomenon especially for metals, W. Nernst equation and its related to osmotic pressure. The lecture covered the changes of redox potential generalized from (i) size effect of bulk metal (ii) solution pressure and (iii) effect of nuleophile with the idea of the shift of Fermi level. He also received considerable attention for applications in photocatalysis, solar cells, drug delivery, surface enhanced Raman spectroscopy and many other important areas. So, from this lecture, the deliverables are as follows:

- Clearing the concept of 'behavior of pure metals', 'redox phenomenon' & 'Fermi level' in the synchronized manner

- Presenting and analysing the well-known industrial processes of silver and gold extraction with cyanide ions.
- Explained the concept of osmotic pressure and electroneutrality.

In 2nd lecture Professor M. K. Deb, School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur (C.G.). Prof. M. K. Deb introduced to the participants an atmospheric chemistry studies concerned with determining the major gases in the Earth's atmosphere. He discussed air pollution became an increasing problem in many large cities, attention turned to identifying the sources, properties, and effects of the myriad of chemical species that exist in the natural and polluted atmosphere. The lecture covered the smog in London in 1952 and in Los Angeles in 1970 that created havoc resulted in researches in the field of photochemical smog formation and in understanding their origin mechanism. He also discussed the identification in 1985 of significant depletion of ozone in the Antarctic stratosphere focused attention on stratospheric chemistry and the susceptibility of the stratosphere to modification. So, from this lecture, the deliverables are as follows:

- Clearing the concept of atmospheric chemistry concerned with determining the major gases in the Earth's atmosphere.
- The focus of this presentation was on some of the basic concepts and principles underlying atmospheric chemistry, as illustrated by the effects of both natural and anthropogenic trace constituents.

Report submitted by

Dr. Mukesh Kumar Tyagi
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Human Resource Development Centre

Pt. Ravishankar Shukla University Raipur, Chhattisgarh

Online Refresher Course in Chemistry

Refresher Course: New Trends of Teaching and Research in Chemistry

14th September to 26th September 2020

Lecture Title: "UV-Vis: Basic Instrumentation and Application in Chemical Analysis" " (Tuesday, September 15, 2021,10:00 AM to 12:00PM)

Speaker: Dr. Kamlesh Shrivas

School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur

In his inspiring lecture, Dr. Kamlesh Shrivas, Associated Prof. School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, Basic Principals of UV-Vis Spectroscopy. In this context he has pointed out some modern type of instruments for UV -Vis in various laboratories which serve according to the purpose and convenience of researchers and academicians.

Dr. Shrivas Further explained UV-Vis spectral analysis of various organic and inorganic molecules chemicals. He extended the discussion towards the application of UV-Vis spectroscopy in recent researches along with few very much inspiring publications. Within one and half lecture he nicely summarized this very vast subject with making the environment very interesting and motivating for all participants.

The session was designed around the theme to empower, enrich and upgrade the participants in UV-Vis spectroscopy and its applications for chemical analysis to research and innovation. The lecture covered most widely explained all sections of the topics and it will really boost all the participants towards being outstanding teacher and researchers even in limited resources availability at college.

Report Submitted by
Archana Asatkar
Asst. Professor, Chemistry Shaheed Veer Narayan Singh Govt College Jobi-Barra
Dist. Raigarh. CG. -496665

Human Resource Development Centre

Pt. Ravishankar Shukla University Raipur, Chhattisgarh

Online Refresher Course in Chemistry

Refresher Course: New Trends of Teaching and Research in Chemistry

14th September to 26th September 2020

Lecture Title: "Water Pollution and Health Hazard"
" (Tuesday, September 15, 2021,12:15 PM to 13:45 PM)

Speaker: Prof. K S Patel
Retd. Professor, S.O.S. in Chemistry, Pt. Ravishankar University, Raipur
Present Address: AMITY University, Raipur

In his inspiring lecture, **Prof. K S Patel**, Retd., Prof. School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, presently working at AMITY University, Raipur, Talked about water quality assessment, disease born with water and their health hazardous and various parameter of water quality analysis.

Prof. Patel discussed about pure water, its quality and present scenario of the availability of water. He extended his lecture towards various parameter of water quality analysis like COD, BOD, DO, Turbidity, Alkalinity, Surfactants, NPK etc. Prof Patel explained the water borne diseases and associated metal ions along with the diseases and affected areas of Chhattisgarh state. He nicely explained the different type of fluorosis disease its symptom, causes and its solution with pictorial representation. He further added causes, symptom of Psoriasis and Minamata diseases, nitrate poisoning and the instruments which is being used to detect nitrate poisoning in water.

The lecture covered most widely explained all sections of the topics and it was awakening and awareness creating towards safe drinking water uptake. The talk of the Prof Patel will help us to understand the various parameter of water and boost us towards the research work related to water quality measurements.

Report Submitted by

Archana Asatkar
Asst. Professor, Chemistry Shaheed Veer Narayan
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Refresher Course in Chemistry

(From14thSept.to26thSept.2020)

Date-15/09/2020

Resource Person- Dr.S.K.Mehta, Professor in department of Chemistry ,Punjab University Chandigarh.

Topic- Quality Research at Higher Education Institutions.

In the third session resource person Dr.S.K Mehta was introduced by Dr. Gaurishankar Roymahapatra. In his deliberation of lecture Dr. S.K Mehta defined research and told us that how can get a good research outcome by using the potential of the student. He also explained SAIF and SRISTI portal and their usages. He also give brief knowledge about CRIKC which is very beneficial and facilitated for all young teachers. He also threw light on these following topics:

1) Important of research cluster.

2) Objectives of CRIKC.

3) Need for soft skill development.

4) Innovative teaching methods.

5) Project based learning.

6) Teaching and Research assistants.

7) Importance of research communication.

8) How to promote science and technology.

At last he quenched the thirst of the participants by giving their answers.

In the fourth session Dr.A.P Mishra , Professor department of Chemistry, Dr. H.S.G. University Sagar (M.P) was resource person. His

topic was on Bio-Inorganic Chemistry Metal Ions in Biology. He was heartily welcomed by the chairperson Dr. Gourisankar Mohapatra. He started his lecture with recent issues and concept of food. He told the bio inorganic chemistry has emerged as a new interdisciplinary research area. Bio-coordination chemistry has been used in medical sciences in medical science in many ways. He also told about the importance of chelate and how chelates are used in the treatment and daigonosis of diseases. In his lecture he explained the importance of metal ions in bio-chemistry. He shared his personal experience which is very useful for us. At last he answered the questions of the participants.

Some important points of his lecture were following these---

1) Components of aayurvedic medicines.

2) Some metalloenzymes and their biochemical functions.

3) Indicators of biologically important elements.

4) Biological Roles of Metallic elements.

5) Physiological Roles of Metal ions.

6) Factors affecting metal toxicity.

Chairperson

Dr. Gourisankar Mohapatra

Report submitted by

Mrs. Aarati Sao
Assist. Prof. (Chemistry)

Lt. Shri Jaidev Satpathi govt. College Basna

Dist.- Mahasamund (C.G.)

ONLINE REFRESHER COURSE IN CHEMISTRY

NEW TRENDS OF TEACHING AND RESEARCH IN CHEMISTRY

(14th – 26th Sept., 2020)

Organised by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur (C.G.)

Lecture Title : " Electronic Structure of Atom : Conceptual Development" (16th September, 2020; 10.30 AM to 12.00 noon)

Speaker – Prof. Sanjiv Kumar

In his inspiring lecture, **Prof. Sanjiv Kumar**, Professor of school of Sciences, Indira Gandhi National Open University, Maidan Garhi, New Delhi has introduced the interesting and more fundamental topics Electronic Structure of Atom : Conceptual Development. He has enlightened his lecture from the philosophical foundation of atom through the big journey to Quantum Mechanical treatment of Hydrogen atom. Prof. S. Kumar has explained lucidly about the discovery of atom of John Dalton (1803), discovery of Structure of atom by Rutherford, Neils Bohr and line spectra of H-atom. He has nicely presented about the Classical Mechanics, Challenges to Classical Mechanics, Wave Mechanics, postulates of Quantum Mechanics, physical significance of wave function , De Broglies matter wave, Schrodingers approach and its wave equation, Quantum mechanical treatment of H- atom, Radial distribution function of different orbitals etc. more clearly. At the end of the lecture some participants asked him different types of question relating to the topics in the interaction session. All participants have fully satisfied him for his all appropriate answers. It is also worth mentioning that all participants have been benefited for his inspiring lecture.

Report Submitted by

Dr. Monirul Islam

Assistant Professor

Seth Anandram Jaipuria College

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ONLINE REFRESHER COURSE IN CHEMISTRY

NEW TRENDS OF TEACHING AND RESEARCH IN CHEMISTRY

(14th – 26th Sept., 2020)

Organised by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur (C.G.)

Lecture Title : " NEW ROLES OF CHEMISTRY TEACHERS IN TECHNOLOGY DRIVEN HIGHER EDUCATION" (16th September, 2020; 12:15 to 13:45)

Speaker – Dr. Vimal Rarh

In her inspiring lecture, **Dr. Vimal Rarh**, Coordinator, National Resource Centre of Chemistry of MHRD, Project Head & Joint Director, Guru Angad Dev Teaching Learning Centre of MHRD, SGTB ,Khalsa College, University of Delhi, Delhi has introduced the more interesting topics *NEW ROLES OF CHEMISTRY TEACHERS IN TECHNOLOGY DRIVEN HIGHER EDUCATION*. She has enlightened his lecture about the new roles of teacher by ICT empowered dissemination of knowledge. ICT enabled education e- learning is related to (a) curriculam and content development methodology (b) blended/online teaching and learning and (c) assessments like formative and summative online and offline. She has properly differentiated between the traditional roles of teachers and new roles of teachers. Formal education is associated with syllabi, teaching learning and assessment. Teacher have play a key role in the teaching learning and assessment. She has nicely presented about the Innovative and Unique modules in chemistry class room that associated with chem news, chem talks, chem safe labs, chem Nobel Laureate, chem pedagogy, chem. Simplified, chem ICT tools, Chem error, chem. Industry, chem history, chem misconceptions, chem Application, chem quest etc. more clearly. She has nicely explained about the role of teachers in developing and delivering MOOCS and online courses, developing E-content methodology. At the end of the lecture some participants asked her different query relating to the topics in the interaction session. All participants have fully satisfied for her well conversatation. It is also worth mentioning that this talk focus on how the roles of the chemistry teachers are changing in this technology driven higher education and what all thay need to do in order to be successful in these new roles.

Report Submitted by

Dr. Monirul Islam

Assistant Professor

Seth Anandram Jaipuria College

Kolkata –700005 (W.B.)

Report of Prof. R. D. Kaushik, Professor and Head, Department of Chemistry, Gurukul Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India

Today on 16th Sept, 2020 at 2:15 pm, Prof. Kaushik delivered on "Linear Free Energy Relationships"

He discussed about different types of LFERs like Hammett, Taft, Van Bekkum, Sekigawa, and Brown & Okamoto and also gave brief information about application of LFERs alongwith other kinetics features including the isokinetics relationships also focussed on oxidation of aromatic amines and well explained on many correlation between rate or rate constant and equilibrium constant.

He mainly focussed on LFERS and LFER plot.

So from the above relationship, he said that, above theories failed due to some errors.

Next, for the aliphatic reaction series, he focussed on Tafts relationship but by default this theory was also failed due to some errors.

After this Tafts relationship, he discussed on Brown Okamoto. In this theory, he focussed on solvolysis of cumyl chloride in 90% acetone-water system. Also he discussed on Van-Bekkum Relationship.

Last but not the least, he focussed on Sekigawa relationship for the evaluation of new substituent constant. Finally, Prof. Kaushik explained deviation from linear behaviour in the plots between $\log(K/K_0)$ and substitution constant and also focussed on isokinetic relationship.

With this brief and informative lecture, he concluded the fruitful discussion on the topic Linear free energy relationship.

Report submitted by;

Mr. Bharat Chandoba Sonkamble, (Sr. No. 11)

Asst. Professor,

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Bhagwantrao Arts & Science College, Etapalli dist. Gadchiroli (M.S.)

Report of Prof. Anjali Pal, Department of Civil Engineering, Indian Institute of Technology, Kharagpur – 721302, India.

Today on 16th Sept, 2020 at 4:00 pm, Prof. Anjali Pal delivered on "Recovery and Reuse of Organic and Inorganic Pollutants and their further Application towards Catalyst Development"

She focussed on how to do recovery from waste products and recycle lead to zero waste management. So, to recover the waste material, madam said that adsorption process is an efficient process.

Also she discussed on, to decide the adoptability of material, the kinetics and efficiency plays a key role.

She also discussed on, proper condition should be maintained for the recovery of the water sample. Micellar layers can be formed on solid surfaces also called as admicelle.

She basically focussed on how the admicellar layer can be formed or some suitable solid support and also might be applied to recover organic and inorganic pollutant from the water media

She also explained that how to develop some effective catalyst can degrade organic pollutant with the synergistics effect of the admicellar layer.

To overcome the waste and contaminated water, she briefly explained about 12 principle of Green Chemistry.

Also, she focussed on various treatments for the contaminated waste water with the help of physical methods and briefly explained on direct and indirect effect of water.

Mainly she focussed on dyes and structures of dyes like Methyl red, Crystal violet and Malachite green and gave explanation about the classification of surfactant, Classification of SMA.

She discussed that for the extraction of any dyes, fixed bed study is used and for the processing of chemical reactions of some metal ions the Fenton reaction is mostly useful.

Last but not the least, she explained advantages and disadvantages of Fenton rection.

Lastly, she described on heterogeneous catalysts is very efficient, fastly recovery rate and can be strongly re-utilise.

With this brief and informative lecture, she concluded the fruitful discussion on the topic Recovery and Reuse of Organic and Inorganic Pollutants and their further Application towards Catalyst Development

Report submitted by;

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Asst. Professor,

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ONLINE REFRESHER COURSE IN CHEMISTRY

(14th Sept 2020 – 26th Sept 2020)

Lecture Title: *"Stereoselective Synthesis of Natural Product Inspired Carbohybrids for Biological Applications" (Thursday, Sept 17, 2020, Session-10:30 AM -12:00)*

Speaker: *Prof R S Misra*

In his inspiring lecture, Prof. R. S. Misra, Department of Chemistry, Banaras Hindu University, Varanasi introduced the participants to stereoselective synthesis of natural product inspired carbohybrids for biological applications. In this context, Prof. Misra described the regioselective synthesis of chirally enriched tetrahydrocarbozolones and tetrahydrocarbozolones. The participants were informed that Pinacol is used as green oxo acceptor for reductive cyclisation. The speaker well explained the new and efficient methods for the synthesis of a natural product inspired library of carbohydrate fused Pyranol(3,2-C) quinolones hybrids. The participants were also informed that these methods had been successfully applied to diverse substituted substrates bearing electron-donating and withdrawing groups. He narrated how antiproliferative activity of these synthesized carbohybrids were determined against MCF-7 (breast) and HepG2 (liver) cancer cells. The speaker also mentioned that the selected library members of Pyranol (3,2-C) and quinolones hybrids displayed low micromolar and selective antiproliferative activity. He also described a new route for the preparation of chirally enriched tetrahydrocarbazolones and tetrahydrocarbazoles

So, from this lecture, the deliverables are as follows:

- Application of stereoselective synthesis in the field of Carbohybrids
- Expressing the new and efficient methods for the synthesis of a natural product inspired library of carbohydrate fused Pyranol(3,2-C) quinolones hybrids
- Stereoselective synthesis of library of molecules is tolerable with the broad range of EDG and EWG
- Expressing the antiproliferative activity of Pyranol (3,2-C) and quinolones hybrids

Report Submitted By

Sanjay Kumar Jain
Assistant. Prof. Chemistry
Govt. RMD Girls PG College, Ambikapur

HRDC PRSU Raipur 492010 Chhattisgarh

ONLINE REFRESHER COURSE IN CHEMISTRY

(14th Sept 2020 – 26th Sept 2020)

Lecture Title: *"S/N Ratio, Sensitivity, Detection limit, Noise and their reduction, the idea of FT" (Thursday, Sept 17, 2020, Session-12:15 PM-1:45PM)*

Speaker: *R.D. Kaushik*

In his inspiring lecture, Prof. R. D. Kaushik, Head, Department of Chemistry, Gurukul Kangri University, Haridwar, introduced the participants to different terms used in analytical chemistry. In this context, he has pointed out that the ability of equipment to distinguish between the signal and noise is expressed as a signal to noise ratio. He nicely explained the sensitivity of a spectrophotometric method. Sandell's sensitivity, sensitivity in terms of molar extinction coefficient and comparison of sensitivity and detection limits were discussed in detail. The participants were informed about sources of noise and different types of noises in instruments. Professor Koushik also described different types of environmental noise and fundamental noise such as white noise and flickered noise along with their sources and methods of reduction. The participants also learned the basic idea of Fourier transformation technique and its applications in emissions and absorption spectroscopy. Through his initiative talk, Prof. Koushik well explained the different terms, S/N Ratio, Sensitivity, Detection limit, sources, types and reduction methods of noise and Fourier transform technique in a straightforward and exciting manner.

So, from this lecture, the deliverables are as follows:

- Role of instruments to distinguish between the signal and noise.
- Optimizing sensitivity keeping the S/N ratio within the limit of tolerance
- Presenting the classification of different types of noises – sources and remedy
- Explaining the basic principles of FT technique
- Demonstrating applications of FT in different types of emission and absorption spectroscopy.

Report Submitted By

Sanjay Kumar Jain
Assistant. Prof. Chemistry
Govt. RMD Girls PG College, Ambikapur

UGC-Human Resource Development Centre
Pt. Ravishankar Shukla University, Raipur (C. G.)

Online Refresher Course in Chemistry, New Trends of Teaching and Research in Chemistry (14th - 26th September. 2020)

Lecture Title: "**Construction of the Phase Diagram of One, Two and Three Component systems**" (Thursday, 17 September, 2020, Session – III, 14:15 to 15:45)

Speaker: Prof. Pramila K. Misra

The lecture delivered by Prof. Pramila K. Misra, Centre of studies in the surface science and technology, School of Chemistry, Sambalpur University, Odisha, India, emphasized on the construction of the phase diagram of one, two and three component systems. She started with basics of phase diagram like introduction of phase, components, degree of freedom and derivation of phase rule.

She was taking appropriate examples of different systems to describe phenomenon of components. She utilized the basics to describe the applications of the rules in the phase diagram of one component Water system and Sulphur system. She also described the Polymorphism and Enantiotropy phenomenon. In the two-component system, she described Eutectic Phase Diagram and also shown a table with examples exhibiting the formation of more than one congruent compound. In the three-component system, she emphasized triangular plot and described systems of three liquid components exhibiting partial miscibility. In this part, one by one she has taken one pair, two pair and three pair of partially miscible liquids and gave idea of composition calculation, plait point, binodal curve, effect of temperature, critical temperature, relative mass calculation and miscible pair. She also described crystallization of pure components, formation of binary compounds such as a salt hydrate, formation of two salt hydrate and formation of a double salt.

Finally, I would like to say that it was a great lecture on Phase Diagram and Phase Rule.

Submitted by –

Name: **Dr. Sumit Srivastava**

Department: Chemistry

College/University: Govt. Swami Atmanand PG College Narayanpur (C.G.) affiliated to Bastar University

UGC-Human Resource Development Centre
Pt. Ravishankar Shukla University, Raipur (C. G.)

Online Refresher Course in Chemistry, New Trends of Teaching and Research in Chemistry (14th - 26th September. 2020)

Lecture Title: "**Catalyst formation in waste beads: Efficient utilization of modified chitosan beads generated after metal ion adsorption process**" (Thursday, 17 September, 2020, Session – IV, 16:00 to 17:30)

Speaker: Prof. Anjali Pal

The lecture delivered by Prof. Anjali Pal, Civil Engineering Department, Indian Institute of technology Kharagpur, Kharagpur, India exhibited the use of chitosan beads for the adsorption of Ni (II) metal ion from the water waste and utilized this Ni based chitosan beads as a reusable and heterogeneous catalyst. She has successfully developed a methodology to minimize the pollution in water. It was a very interesting lecture, I heard after a very long time. She has shown many years of her work within one-and-a-half-hour time. The important points of her lecture were as follows:

- Surfactant, Micelles and their formation.
- Preparation, properties and application of Chitosan bead.
- Preparation and properties of sodium dodecyl sulphate (SDS) modified Chitosan beads.
- Adsolubilization approach for removal of Ni (II) ions from water using POSTCS (CS bead with SDS above the CMC)
- Kinetic and thermodynamic studies have been performed for the removal of Ni (II) ions.
- The Ni (II) adsorption onto the surfactant-modified chitosan beads the material can be converted to a suitable catalyst for the transformation of Nitro compounds into Amino compounds in presence of Sodium borohydride as reducing agent.

Submitted by –
Name: **Dr. Sumit Srivastava**
Department: Chemistry
College/University: Govt. Swami Atmanand PG College Narayanpur (C.G.) affiliated to Bastar University

Repport

Online Refresher Course in Chemistry

UGC HRDC PRSU Raipur (CG)

Session : I time 10:30am **Date:18/09/2020**

Topic: "Intervention In Plant Signaling Through Exogenous Sugar Signaling Precursor Increases Yeild and Resilience

Resource Person : Prof Ram Sagar Misra department of ChemistryInstitute of Science, Banaras Hindu University, Varanasi, Uttar Prades

This lecture is provided by aProfessor Ram Sagar Misra the department of Chemistry Institute of Science, Banaras Hindu University, Varanasi, Uttar Prades has organized a Resource Person on topic "Intervention In Plant Signaling Through Exogenous Sugar Signaling Precursor Increases Yeild and Resilience" on 18.09.2020 for Online Refresher cource in Participant . The objective of this resource person is to create knowledge among the participant on the steps for success in lecture. The Program was started with invocation followed by brief introduction about the resource person. The session started with the key points for preparation to a successful interview and practice. The suggestions given during lecture sessions are as follows: (i) Introduction,Trehaloge in plant (ii) T6P and signalling ,goal of the project (iii) Exploiting the T6P signaling, (iv) Synthesis T6P precursors, Two words photolabile precursorse, (v) Design of signalling precursors, Invitro UNCAGING kinetics, SnRK1 activity of precursors, in planta uptake of signalling precursors, in planta uptake in planta toxicity study, in planta measurement of T6P, in planta quantification of T6P, Effect of release intermediate SnRK1 activity of control precursors, synthesis of C^{13} labelled T6P precursors, distribution of T6P precursors in plants, in plantasugar metabolism, Biosynthetic effect of T6P release, Inceased crop yield (wheat), increased crop biomass (wheats), increased crop reilience (wheats), Conclusion: We have shown here for the first time that a chemical strategy can directly control amount of an important sugar – signalling molecule (T6P) in vivo,etc.At the end, session ended up with vote of thanks delivered by Welcome address & Introduction about the Resource Person Lecture Session Refreshing activity Interaction with the resource person Mock interview Feedback by the participant.

Report Submited by
Sandeep Kumar Tandon
Asst. Professor
Govt. PMRS College Pendra Road(Gaurella)

Repport

Online Refresher Course in Chemistry
UGC HRDC PRSU Raipur (CG)

Session :II time 12:15pm **Date:18/09/2020**

Topic: "Role of Bulk And Trace Metals In Human Body

Resource Person : Prof. R. N. Prasad

This lecture is provided by a Professor R N Prasad senior advisor & Dean, science faculty, JECRC University, Jaipurhas organized a Resource Person on topic "Role of Bulk And Trace Metals In Human Body." on 18.09.2020 for Online Refresher cource in Participant . The objective of this resource person is to create knowledge among the participant on the steps for success in lecture. The Program was started with invocation followed by brief introduction about the resource person. The session started with the key points for preparation to a successful interview and practice. The suggestions given during lecture sessions are as follows: (i) The bio elements, (ii) Abundance of major element, (iii) Amount of metals per kg of body weight & food source, (iv)Classification of cations in biological systems, (v) potassium sodium pump, calsium, (vi) Muscle contraction and relaxation (siding filament model), (vii) Megnesium, chlorophyll, (viii) Two phases of photosynthesis, photosynthetic electron transport, (ix) Crown ether (PEDERSEN), crown ether selectivity, (x) Cryptands (LEHN). At the end, session ended up with vote of thanks delivered by Welcome address & Introduction about the Resource Person Lecture Session Refreshing activity Interaction with the resource person Mock interview Feedback by the participant.

Report Submited by
Sandeep Kumar Tandon
Asst. Professor
Govt. PMRS College Pendra Road(Gaurella)

Report on Microteaching

Name of the Event :- Microteaching
Date of Event :- September 18, 2020 (Time- 2.15pm to 5.30pm)
Location of Event :- HRDC, Pt. Ravishankar Shukla university, Raipur

First of all, I would like to thank Director of HRDC & also coordinator of this Online Refresher Course in Chemistry (Dr. Kallol Kumar Ghosh Sir) for giving me the opportunity to attend the Online Refresher Course in Chemistry. Microteaching session was started on 18-09-2020 at 2.15pm, Dr. Gourisankar Roymahapatra & Dr. Neeraj chaired the first session & second session respectively. Ten participants were allowed for each session but eight attendees joined each session. Three participants were absent & one part could not present his presentation due to technical issue. The session was divided into two segments (First segment – 14.15 p.m. to 15.45 p.m. & Second Segment – 16.00 p.m. to 17.30 p.m.). During the session attendees shared their opinions and thoughts on the varieties topic. The session was very interesting and gave me the opportunity to learn the following issues:

1. Skill of introduction.
2. Skill of explaining.
3. Presentation components.
4. Skill of stimulated variation.
5. Skill of reinforcement.
6. Skill of questioning.
7. Skill of demonstration
8. Skill of closer.

As a participant, I found both the sessions very enriching. The experience gathered here would be of great help for me.

Report submitted by

Amit Das (Sl. No- 20)

Assistant Professor,

Department of Chemistry

Ramsaday College. Howrah, West Bengal. 711401

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ONLINE REFRESHER COURSE IN CHEMISTRY
"New Trends of Teaching and Research in Chemistry"
HRDC, Pt. Ravishankar Shukla University Raipur
(14^{th} to 26^{th} September 2020)

Report of 19^{th} September 2020

Schedule of the day:

Session	Time	Activity
First Session	10:30 am to 12:00 noon	Micro teaching
Second Session	12:15 pm to 1:45 pm	Invited Talk of Prof. R.N.Prasad

On 19^{th} September 2020, Micro teaching of Batch C was scheduled. Ten participants of Batch C presented their micro teaching. Participants taught topic, chosen by them through power point presentation. Each participant was allotted a time slot of six minutes. Assessment of micro teaching was done by Prof. Kuite and Prof. Manish Rai. Topic selected by participants is listed below:

Participant's No.	Name of the Participant	Title /Topic of Microteaching
21	Mukesh Kumar Tyagi	Stereochemistry
22	Neeraj	Auto ionization of water- A pictorial perception
23	Rama Sarojinee	Significance of Activation Energy
24	Rashmi Verma	Polymer and its type
25	Rita Bajpai	Term symbol
26	Rohit Kumar Bargah	Green Chemistry and its Basic Principles
27	Samir Kumar Mandal	Nucleophilic Substitution (S_N) Reaction
28	Sandeep Kumar Tandon	Chemical Kinetics
29	Sandhya Patre	Intermolecular Forces
30	Sanjay Kumar Jain	Lanthanide Contraction: Causes and Consequences '

In the second session, a lecture was delivered by **Prof. R. N. Prasad**, Senior Advisor & Dean, Science Faculty, JECRC University; Jaipur on the topic "Role of Bulk and Trace Metals in Human Body". In his lecture, he describe the role of bulk metals such as Na, K, Mg and Ca and trace metal such as Fe, Cu, Zn, Co, Mn, Al, V, Mo, Sn, Ni, Cr etc. in human system. He also explained the diseases caused due to deficiency of these metals in body. Through his lecture participants learn about the importance of these metals in body.

Report Submitted By:

Dr. Meena Chakraborty
Asst. Prof. Chemistry
Govt. Naveen College Bori, Durg

ONLINE

REFRESHER COURSE

in

CHEMISTRY

New Trends of Teaching and Research in Chemistry

14.09.2020 to 26.09.2020

Organized by

HRDC
PRSU
Raipur 492010
Chhattisgarh

ज्ञान-विज्ञान विमुक्तये

Course Coordinator

Prof. Kallol K Ghosh
SoS in Chemistry
PRSU
Raipur

Lecture Title: "**AIR QUALITY ISSUES OF INDIA**"

(Saturday September 19, 2020, 2:15 PM-3:45 PM)

Speaker: Prof. Shamsh Pervez, School of Studies in Chemistry, Pt. Ravishankar Shukla University

Professor Pervez in his commendable lecture addressed that we are facing increased number of diseases day by day due to air pollution. He stated that air pollution is the 4th highest cause of death among all health risks and airborne particulate matter (PM) is the main culprit for public health in the urban areas. He introduced that he is working in this areas with National and International collaboration all over the world. His statistical and graphical data gave well explanation that PM causes diseases such as bronchitis, impaired lung function, and cardiopulmonary problems. According to him, PM with the aerodynamic diameter of less than 2.5μm (PM 2.5) can deeply penetrate into the human lung. He introduced why IQ level of the new born babies after 2005 is raised. From the lecture we came to know that Pb-free world is the main reason, earlier which came from the petroleum fuel with ethyl tetra-acetate as anti-knocking agent but currently we are noticing more number of cancer patients due to use of benzene. He addressed that low and middle income countries are facing this issues e.g. India, China's people death rate is more than other countries due to air pollution. He maintained with the statistical data that death rate of baby and age greater than 40-50 yrs are the sufferer whereas ages with greater than 80 yrs are more sufferers. He shared his observation that 132276 peoples in 2016 of Chhattisgarh were suffering from acute respiratory ailments which becomes almost double in 2017 (239128 peoples). He clearly maintained that PM2.5 is more vulnerable than PM10. He introduced that significant level of black carbon (BC), organic carbon (OC) and other atmospheric pollutants into local communities, resulting in severe health and environmental impacts. He claimed that Kedarnath incident in 2013 is due to increases black carbon (BC) and organic carbon (OC) in the environment but agreed with the reduction of carbonaceous aerosol emission during the COVID-19 lockdown. As per the air pollution concern he introduced the issues to be taken into account due to particle size, chemical nature and concentration. There were many e.g. mass, physico-chemical and biological properties of air pollution; optical, thermal, molecular properties of atmospheric carbonaceous matter; impact and accumulation status of air toxins to susceptible bio-geo-environment to address adverse effect; atmospheric chemistry to address secondary aerosols formation; measurement and impact study of bioaerosol. The goal of ambient particle sampling has been introduced nicely to determine compliance with air quality standards; examine the extent and causes of elevated concentrations; apportion PM chemical constituents to pollution sources; evaluate adverse effects on health, visibility, climate and ecosystem. He introduced the air pollution study that designing the study, sampling plan and sample handling, analysis must follow standard protocol. Requirement of an ambient sampling system were well explained along with the some instruments. According to his statistical data we came to know that India contributed 18·1% of the global population but had 26·2% of the global air pollution in 2017. He described air sampling methods and results of some case studies and ended with an appeal to start multidisciplinary research.

So, from this lecture, the deliverables are as follows:

- Several diseases occurring due to air pollution
- Air pollution is the 4th highest cause of death among all health risks.

- Particulate Matter (PM) with the aerodynamic diameter of less than 2.5μm (PM 2.5) in the polluted air is the main culprit of the several diseases.
- IQ level of the new born babies after 2005 is raised due to lead free air.
- Babies and peoples greater than 40-50 yrs old are the sufferer whereas peoples with greater than 80 yrs are more sufferers.
- Increased level of black carbon (BC) and organic carbon (OC) in the air is alarming.
- Particle size, chemical nature and concentration of the pollutants are crucial.
- Ambient particle sampling is essential for air quality measurement.

Report submitted by

Dr. Samir Kumar Mandal
Assistant Professor
Saldiha College
Applicant ID: 26

Report on Lecture Session

Name of the Event: Lecture session on selected topic (Lecture No 20 & 21)

Date of Event: September 21, 2020

Time: 10: 30 am – 13:45pm

Location of Event: HRDC, Pt. Ravishankar Shukla university, Raipur

Resource Persons:

(1) **Prof. D. C. Mukherjee**

Retired Professor, Dept. of Chemistry, University of Calcutta, Kolkata

(2) **Professor C. R. Sinha**

Professor and HOD, Dept. of Chemistry, Jadavpur University, Kolkata

Session Chair: Dr. Gourisankar Roymahapatra, Haldia Institute of Technology, Haldia

First of all, I would like to thank respected director of HRDC, Prof. A. K. Gupta, & coordinator of this Online Refresher Course (ORC) Prof. K. K. Ghosh, for giving me the opportunity to participate this ORC in Chemistry and to be the Rapporter of 1st lecture session today (Lecture No 20 & 21).

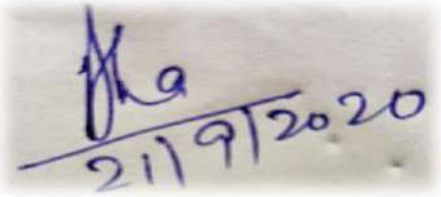
Lecture session was started at 10:30 am. Dr. Gourisankar Roymahapatra of Haldia Institute of Technology chaired the session and introduced both speakers in a humble and graceful way. Prof. Mukherjee, who is the senior most among all speakers in the list, sailed us all to the history of our own Indian science heritage with a very simple title 'A HISTORIC LETTER THAT LED TO QUANTUM STATISTICS'. His style of delivering lecture made all of us 'refreshed' in true sense after having some technical topics in last week. He tailed us the history of 'Qunta', and its relation with Acharya S. N. Baose, the 2nd National Professor of our country.

In 2nd lecture Prof. Sinha lucidly explained the use of chemistry in our life in his own style within the topic 'Chemistry-For Better Future'. From his lecture we learned how to plan our research work towards real problem solving. Specially the sensing and separation of Pd(0), Pd(II) and total Pd is a remarkable development of our own Indian Science. It was a nice elaboration how to use fluorescence spectroscopy towards metal sensing analysis and validation. He also explained

us vividly about the Metal Organic Framework (MOF), Coordination polymer and use of Co-ordination compounds in designing Photosensitive Optoelectronic devices.

Apart from scheduled lectures, a memorable moment came to all of us, when our session chair Dr. Roymahapatra, requested Prof. D. C. Mukherjee, to share his own memory with Acharya S. N. Bose. The tale of 'Two Cups of Coffee' transformed all of us emotional and it is truly a blessing to all participants of ORC to get valuable lecture from Prof. Mukherjee, who got the blessings and 'ORDER' from Achraya Bose to teach Bose-Einstein statistics to the end of his life. All participants expressed ovation to Prof. Mukherjee for the completion of his 60 years of teaching carrier. The session ended with vote of thanks delivered by the chairman of the session.

Report submitted by



Dr. Bameshwar Prasad Sinha
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ONLINE

REFRESHER COURSE IN

CHEMISTRY

New Trends of Teaching and Research in Chemistry

14th-26th September, 2020

Organized by

Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur (C.G.)

Date- 21/09/2020 (Monday)

Report of Post lunch session (III And IV)

Session III – Title- Understanding nature through molecular interaction

Resource Person- Prof. B. K. Mishra Professor of Chemistry (Retd,), Sambalpur University, Sambalpur, Odisha.

Lecture – 22

The deliberation /talk delivered by honourable Dr B K Mishra . It has been very nice explanation on Material and its interaction . He has been given very nice and interesting talk on the topic . The basis of these organizations are mostly due to different types of interactions – both attractive and repulsive; polar and nonpolar, ionic and neutral Some key points of the lecture are as follows

- About disintegration is a strategy for analysing organization in other words a focus on the basic unit of organism.
- Discussed about composition.
  Precursor ⟶ Monomer unit ⟶ Macromolecules ⟶ Supramolecules
  Amino Acids, aromatic bases , glucose ,ribose to cell
- A brief knowledge given about the elements which are important part of molecules. In all living systems we can always find 4 basic elements: carbon, oxygen, nitrogen and hydrogen. Carbon is the basic building unit contained in living matter. The percentage of carbon in the mass of living matter is 19.4 %. Oxygen and hydrogen are present in almost all organic compounds which create living **organisms**.

- Also talked about Chemical makeup of organism. And discussed about water and 30 common molecules.
- The nature of intermolecular forces.
- Types of intermolecular interaction.
    a. Short range repulsion
    b. Electrostatic interaction
    c. Dipolar interaction
    d. Fluctuating dipoles
    e. Cation interaction
    f. Hydrogen bonding
    g. Hydrophobic interaction
    h. pi –pi stacking
- Last section of lecture was about why water so important.

Session IV

Title- Imperfection in solids

Resource Person- Dr A S Aswar Prof. and Head Department of Chemistry ,Sant Gadge Baba Amravati University.

Lecture – 23

In this session honourable resource person delivered lecture on solid state and its imperfection or defects. He started session by some quotation which is very interesting. He has been given introduction about Solid-state chemistry sometimes referred as materials chemistry which is the study of the synthesis, structure, and properties of solid phase materials. The important point of the session was discussion on perfect and imperfect type of crystals with suitable examples. Some key points of the lecture are as follows

- Process of crystallization.
- Ideal and perfect crystal
- About defects which is deviation from perfect atomic periodicity.
- Why defects are important
- Brief discussion on line defect, Line defects weakens the structure along a one-dimensional space, and the defects type and density affects the mechanical properties of the solids.
- The higher internal energy state of crystal is stabilized by an increase in entropy and crystal become disordered
- Very nice explanation of classification of defects by flow chart. On atomic , subatomic and lattice.
- Latter on discussed about classification of imperfections based on dimensionality very nice explanation of zero dimensional, one dimensional, two dimensional and three dimensional pattern.
- Separately given collective knowledge on defects in solid impurity defects , stoichiometric defects and non stoichiometric defects.

- Consequences of defects.
- Interesting explanation of four types of non stoichiometry in non transition metals MOs.
- Impurity defects discussed it is a defect in which a foreign atom occupies a regular lattice site. Or it is present at the vacant interstitial site , semiconductor properties and example of NaCl and $SrCl_2$
- Last section of lecture was about creating color center with special reference to F center and hole center.

Submitted by

Dr Rashmi Verma
Department of chemistry
Dr C V Raman University
Kargi Road Kota Bilaspur CG

UGC- Human Resource Development Center
Pt. Ravishankar Shukla University, Raipur

Online Refresher Course in Chemistry new Trends of Teaching and Research in Chemistry
(14th September 2020 - 26th September 2020)

Lecture Title: "PATH TO QUANTUM MECHANICS FROM CLASSICAL MECHANICS"

(TUESDAY, SEPTEMBER, 22, 2020, 10:30 AM - 12:00 PM)

Speaker: *Prof. D. C. Mukherjee*

In his inspiring lecture, Prof. D. C Mukherjee, Advisor & Former President, Indian Chemical Society Former Professor, Department of Chemistry, Calcutta University Emeritus Professor, Heritage Institute of Technology, Kolkata introduced the participants to the Quantum and Classical Mechanics. In this context, he has pointed out Classical Mechanics give accurate description of the motion of particles that are considerably heavier than individual atom and the move with velocities much smaller that of light and Quantum Mechanics is an improvement on Classical Mechanics that may be used in studying the motion of atomic and sub-atomic particles. The limitation to particles moving slowly compared to the velocity of light continues to apply in most of the Quantum Mechanics. He explained the kinetic and potential energy, Newton's equation of motion, lagrangian equation of motion, invariant under any co-ordinate transformation and Coupled equation is Hamilton's equation of motion and Hamoilton's function represent the total energy rule for constructing the Quantum mechanical is to replace momentum $p_x = h/2\pi i.\delta/\delta x$ and to leave the co-ordinate. He also mentioned Schrodinger Postulate the wave function (ψ) should satisfy the equation $\hat{H}\psi = E\psi$ (this is Schrodinger wave equation) were discussed in detail. The lecture covered the molecular quantum mechanics, is a branch of chemistry focused on the application of quantum mechanics in physical models and experiments of chemical systems. Understanding electronic structure and molecular dynamics using the Schrödinger equations are central topics in quantum chemistry. The participants were informed about history of development of Quantum Statics and Quantum Mechanics *etc*. Post completion of this lecture, the participants learned Quantum mechanics is an important tool to understand at the theoretical level the electronic structure of chemical compounds and the mechanism, thermodynamics, and kinetics of chemical reactions. Quantum mechanics involves the study of material at the atomic level. This field deals with probabilities since we cannot definitely locate a particle.

So, from this lecture, the deliverables are as follows:

- Quantum and Classical Mechanics
- Hamoilton's function represent
- Newton's equation of motion
- Schrodinger Postulate the wave function

Report Submitted By

Dr. Sandhya Patre
Assstant Professor
Sant Shiromani Guru Ravidas Government College,
Sargaon, Dist. - Mungeli, Chhattisgarh, India

UGC- Human Resource Development Center
Pt. Ravishankar Shukla University, Raipur

Online Refresher Course in Chemistry new Trends of Teaching and Research in Chemistry
(14th September 2020 - 26th September 2020)

Lecture Title: "**STRUCTURE DIRECTED DELIVERY: DESIGN OF COORDINATION POLYMERS (CPs) OR METAL ORGANIC FRAMEWORKS (MOFs)**"

(TUESDAY, SEPTEMBER, 22, 2020, 12:15 PM - 13:45 PM)

Speaker: *Prof. Chittaranjan Sinha*

In his inspiring lecture, Professor & Head, Department of Chemistry, Jadavpur University, Kolkata-700 032, India, introduced the participants to the design of coordination polymers or MOFS. In this context, he has pointed out spatially adjustable donor centers design is a challenging task for making multinuclear coordination compounds. One of the articulate is the organic linker to bridge metal centers for the generation of coordination polymers which may extend in one (1D), two (2D) or three dimensions (3D). At present popular term is MOF or porous PCPs. He explained the potential applications of these materials are many, such as, gas storage and separation, catalysis, electrical conductivity, sensing, magnetism, drug delivery solar cell etc. He also mentioned the role of linker, metal knots and reaction condition. The lecture covered the coordination polymers (CPs) or metal-organic frameworks (MOFs) containing guest molecules are very attractive research field, not only owing to their designable structure, unusual flexibilities, but also on their tunable functional application. Post completion of this lecture, the participants learned linkage is isomers differ in the atom of ligand bonded to the metal in the complex, vitamin C, L-ascorbic acid strong antioxidant, reduces risk of heart disease, LDL level, blood urea; lower blood pressure boost immunity, anticancer drugs, sulphonamides are structure analoges and competitive antagonists of PABA, photochemical behavior in solvent media, The field has impacted many areas of science including commercial applications from gas storage agents to new investigations as drug-delivery vehicles.

So, from this lecture, the deliverables are as follows:

- Coordination polymers (cps) or metal organic frameworks.
- Discovery of Sulpha Drugs and Anticancer Drugs.
- SMX has developed antitumor, antifungal, anticarbonic anhydrase, protease inhibitor activity.
- PABA is used for the synthesis of folic acid an important metabolic in DNA synthesis
- Hydrogen Bonded Interaction, π-π interaction and photochromic behavior in solvent, solid media

Report Submitted By

Dr. Sandhya Patre
Assistant Professor
Sant Shiromani Guru Ravidas Government College,
Sargaon, Dist. - Mungeli, Chhattisgarh, India

Pt. RAVISHANKAR SHUKLA UNIVERSITY

TWO WEEK ONLINE REFRESHER COURSE IN CHEMISTRY
New Trends of Teaching and Research in Chemistry

(14th September – 26th September, 2020)

Day 8 Report
(Afternoon Session)

Reported by: Yogita Thakur
Government Ghanshyam Singh Gupt P.G College, Balod, Chhattisgarh

Chairperson: Dr. Rita Bajpai
Dr. JPM Government Science College, Mungeli, Chhattisgarh

Introduction:
Pt. Ravishankar Shukla University conducted a two-Week Online Refresher Course in Chemistry from 14th September to 26th September 2020 co-ordinated by Prof. Kallol K. Ghosh.

Report of the Afternoon session

Today is the 8th day of our Online Refresher program. In the afternoon session online lecture of the program.

- First lecture delivered by **Dr. A.P.Mishra** , D.Phil, D.Sc(Alld) from Dr. H.S Gour Central University, Sagar (MP)
- Second lecture delivered by **Dr. B.K. Mishra**, Professor of Chemistry (retd), Sambalpur University.
- Both the Resource person were introduced to the google meet class by Dr. Rita Bajpai.
- During the intermittent after first lecture our Honourable Vice chancellor Prof. K.L Verma significantly joined the online program and interacted actively with participants of RC chemistry.

Summary Report of the 1st Lecture:

In the session, first lecture delivered by Prof. A.P. Mishra on topic- **"Metal Chelates in Medicine: Practices and Prospects"**
He explained various topic:

- Utility of metal ions in life (Nutritionally important, medically important
- Role of inorganic constituents in life and biochemical process

- Biomedical inorganic chemistry ("Elemental Medicine") is an important new of chemistry
- Metal chelates in Medicine
- Explain what kind of compounds become drugs
- Chelation therapy, Pharmacokinetics, pharmacodynamics
- Explain the treatment of metal deficiencies
- Some inorganic compounds administered as drugs
- Radiation therapy for cancer
- Metals in body imaging (Radio-imaging)
- Nanotechnology in medicine-Quantum dots
- Metal and metal chelate in chemotherapy
- Neuropharmacology, photodynamic therapy
- Medicinal properties of organometallic compounds
- Antibacterial and Antifungal activity of bioactive ligands(drugs)-metal(ll) complexes
- Metal complexes can interact in the body by binding to DNA, affecting cellular equilibrium and inhibit protein function.

SUMMARY REPORT OF THE 2ND LECTURE

Second lecture delivered by Prof. B.K. Mishra on topic- **"Understanding Nature through Molecular interaction"**

- He explained: Molecular interaction and types, nature of molecular interaction
- It deals various interactions: hydrogen bonding, Vander Waal interaction, hydrophobic, ion-dipole interaction, dipole-dipole interaction, pi-pi interaction.
- Folding and assembly of biological macromolecules: Molecular interaction is important in Protein folding (It is the conversion from a denatured state to native state)
- Molecular interaction within a protein native state/denatured state (with surrounding water molecules)
- Molecular interaction in water:
    - Anatomy, geometry, cooperativity of hydrogen bonding.
    - Hydrogen bonding in Biological system
    - water is a biochemical reagent (biopolymer formation)
    - empirical description, molecular basis, thermodynamic basis of the hydrophobic effect.
- Application of Molecular interaction: Intermolecular force, Molecular docking, Interaction between ubiquitin and its binding protein etc.
- Biomolecular organization.

Lessons learnt and the outcome of the session:

During this lesson we learned about role of metallodrug, inorganic medicine and molecular interaction in Biological system.

End of session

Dr. A.P. Mishra and Dr. B. K. Mishra class ended with the votes of thanks from the chairperson of the day, Dr. Rita Bajpai.

Lecture Title: "A Stimulating Phosphomolybdate -Dye Matrix for Chromism and Nitrogen or Oxygen Binding"
(Wednesday September 23, 2020, 10:30 AM to 12:00 PM)
Speaker: Prof. Tarasankar Pal, Distinguished Visiting Professor in the University of Johannesburg, S. A.

Today Prof. Pal in his inspiring lecture, discussed the beauty of "throw away chemicals", ammonium phosphomolybdate (APM) [$(NH_4)_3PMo_{12}O_{40}$], in his basic research. The genesis of the research have been explained from the concept and observation obtained from the hydroxylation of benzophenone using APM under photochemical condition [*chem. comm.* **2009**, 7119]. He uttered that one of his fellow inspired and intuitively designed the material from APM that is prepared in UG lab with cationic dye like malachite green (MG). Prof. Pal expressed that the new material was robust and he abbreviated the green complex phosphomolybdate-malachite as PMMG. He nicely explained his thought and observation with heating and cooling of PMMG from green to yellow and vice-versa. He explained the observation nicely from the experiment in a vial with green copper sulphate ($CuSO_4.5H_2O$) and PMMG complex in alternative heating and confirmed that yellow PPMG is becoming moisture sensor. Prof. Pal claimed that he then thoughtfully developed the mechanism by which the material absorbed inert nitrogen gas or oxygen gas and changes colour. He concluded with how he established the chromism by binding the nitrogen or oxygen with the PMMG.

So, from this lecture, the deliverables are as follows:

- Throw away chemicals may be useful as new materials.
- The new material PMMG green complex display chromism property.
- The new material PMMG yellow complex able to bind N_2 or O_2.
- The new material PMMG bind with O_2 may open for oxidative catalyst.

Report submitted by
Dr. Samir Kumar Mandal
Assistant Professor
Saldiha College
Applicant ID: 26

Organized by

HRDC
PRSU
Raipur 492010
Chhattisgarh

ONLINE

REFRESHER COURSE

in

CHEMISTRY

New Trends of Teaching and Research in Chemistry

14.09.2020 to 26.09.2020

ज्ञान-विज्ञान विमुक्तये

Course Coordinator

Prof. Kallol K Ghosh
SoS in Chemistry
PRSU
Raipur

Lecture Title: "Understanding Nature through Molecular Interaction"
(Wednesday September 23, 2020, 12:15 PM to 1:45 PM)
Speaker: Prof. B. K. Mishra, Sambalpur University

With the continuation of the previous lecture, today Prof. Mishra in his informative and commendable lecture nicely introduced with molecular organisation which is a result of different molecular interaction e.g. ionic, dipole-dipole, ion-dipole, dipole-induced-dipole, London force, H-bond etc. He explained over the audience that it is only due to lowering of energy. Prof. Mishra explained the model of selective interaction of metal ions with crown ethers, cryptands, spherands, lariat ether and calixarene that are responsible for metal ion transport in living system. He introduced how podands gives different structures depending on the different metals. From his lecture we were enriched with the term molecular tweezer and came to know how light energy changes the tapping of guest molecule. Based on this he discussed the model of molecular lock that undergoes on-off with salt in-out mechanism. Then he nicely explored the idea of molecular mechanical machine. In his lecture he nicely introduced various rotaxane model that work like mechanical ball-bearing system. In this model molecular movement had been explained using chemical energy, electrical energy, solvation energy, photochemical energy, optoelectronic energy etc. Prof. Mishra also explained the preparation of fullerene and from this introduced nanotrucks, consisting of rotating axle and nanocars, a model of single molecular cars.

So, from this lecture, the deliverables are as follows:

- Atomic interaction is somewhat different from molecular machine.
- Interaction occurs to attain the stable system.
- Molecular interaction is the basis of natural phenomena.
- Tapping of metal ion with suitable ligand is the basis of metal transport in living system.
- Structures of host and guest molecules are responsible for molecular interaction.
- Movement of molecules in a locked system depends on molecular interaction.
- Understanding molecular interaction of small to large molecule is important to make molecular machine.

Report submitted by
Dr. Samir Kumar Mandal
Assistant Professor
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HRDC, Pt. Ravishankar Shukla University, Raipur, Chhattisgarh

Online Refresher Course In Chemistry

(14th – 26th September, 2020)

Seminar Presentation has been done by 35 participants in this RC as an extempore and the session was judged by Prof. M. K. Deb, School of Studies in Chemistry, PRSU, Raipur.

Among various topics like: i)National Education Policy 2020, ii)Research Oriented Teaching, iii)Covid 19 and Role of Chemistry, iv)Holistic and Multidisciplinary Education, v)Catalyzing Quality Education Research through National Research Foundation and vi)Online Teaching and Learning, each participant choose one topic and give the extempore lecture within 4 minutes. The list of the participants with their topic name and main points highlighted in their lecture is given below :

Name of the participants	Topic of the seminar
1. Aatma Ram Verma 2. Archana Asatkar 3. Bameshwar Prasad Sinha 4. Sandhya Patre 5. Sanjay Kumar Jain 6. Shabir Hussain Lone 7. Sudip Kumar De 8. Sumit Srivastava 9. Yogita Thakur	**National Education Policy 2020**
1. George T M 2. Gourisankar Roymahapatra 3. Sougata Sarkar	**Research Oriented Teaching**
1. Alka Shukla 2. Averi Guha 3. Bharat Chandoba Sonkamble 4. Bhaskar Sharma 5. Monirul Islam 6. Mukesh Kumar Tyagi 7. Rashmi Verma 8. Rohit Kumar Bargah 9. Samir Kumar Mandal 10. Shilpa Yadav 11. Waheed Ahmad Khanday	**COVID 19 and Role of Chemistry**
1. Aarati Sao 2. Amit Das 3. Ashutosh Pal 4. Hena Paul	**Online Teaching and Learning**

Name of the participants	Topic of the seminar
5. Indrajit Chakraborty 6. Meena Chakraborty 7. Neeraj 8. Rama Sarojinee 9. Rita Bajpai 10. Sandeep Kumar Tandon 11. Saugata Konar 12. Vitthal Nanaji Gowardipe	**Online Teaching and Learning**

From the lectures given by the participants and the expert's comments in this seminar session, the deliverables on each topic are as follows:

- **National Education Policy 2020**- This is the third education policy in the country and the need of it is to move atleast 50% students in the higher education. The 10+2 level is proposed to be replace by the 5+3+3+4 level in order to give emphasis on the foundation period of a child where the preschool has given importance. In this policy it is stated that assessment should be multi-directional such that report card of a student will be based on his/her analytical and critical thinking and not on their memorizing power only. This policy also give chance to pursue education in one's mother language and focused on holistic, vocational and skill-based education.
- **Research Oriented Teaching**- The role of the teachers are transformer and for this it is the duty of the teachers to make the subject interesting to the students so that they get motivated to learn that subject and this is only possible if the students can be engaged in some simple research activities. Such research exposure from early stages will also make the students become more passionate about the subjects and it will make them motivated to persue higher education which is the need of the hour.
- **COVID 19 and Role of Chemistry-** As SARS-CoV-2 continues to spread at an alarming rate, chemists around the world are making major contributions to the global fight against the novel coronavirus. Starting from the prevention to cure of this disease COVID 19 chemistry is playing a very crucial role. We all are aware of the fact about the hygiene measures which include washing our hands and other materials with soaps and doing proper sanitization regularly and in preparation of all these sanitization products contribution of chemistry is indispensable. Also now masks are being produced by nanomaterials to prevent the virus. In addition to these prevention measures for the cure of COVID 19 all over the country research is going on over the invention of vaccines

which is based on the knowledge of chemistry. The three different types of vaccines that are already in progress has been discussed along with the mention of the antiviral drugs that are in use for the treatment of COVID 19.

- **Online Teaching and Learning-** Although this online teaching is introduced long back all over the world but in this pandemic situation its use has become enormous since now we have no option for the offline education mode. Discussions occurred both on the advantages and disadvantages of this online teaching and learning mode. Among the advantages of this mode emphasis has been given to the flexibility, cost-effectiveness. Anyone can access the teaching of any teacher from any part of the world staying at home like distance education which is really a good opportunity for the students. But long time screen exposure is very harmful specially for the children and also the family feeling between the teacher and students is missing here. The practical classes also faced a lots of problem in this online learning mode and the financially weaker sections of the society is also facing a lots of problems due to their lack of resources to provide this education to their family members.

Report Submitted by

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ONLINE

REFRESHER COURSE IN

CHEMISTRY

New Trends of Teaching and Research in Chemistry

14th-26th September, 2020

Organized by

Human Resource Development Centre,(HRDC) Pt. Ravishankar Shukla University, Raipur (C.G.)

Report For: Session (I And II) : Date- 24/09/2020 (Thursday):

(A)Report For: Session (I) : Date:24/09/20 (Lecture-30):

Title- Nuclear Magnetic Resonance (NMR), Principle And Applications

Resource Person/Speaker: Dr Sanjiv Kumar, Professor of Physical Chemistry, School of Science, Indra Gandhi National Open University(IGNOU), Maidan Garhi, New Delhi

Lecture No. 30

To begin with the 30th lecture of this Refresher Course in the session-I, on 24th of September,2020, the talk delivered by honourable Dr Sanjeev kumar, Professor of Physical Chemistry School of Science Indra Gandhi National Open University, Maidan Garhi, New Delhi was really an inspiring one in which through his cognitive approach, he introduced all the Participants with the significant Principle & effective applications of NMR Spectroscopy. The lecture was very nicely initiated with excellent presentation outlines of NMR & its working principle and applications including a number of examples. The lecture was very beautifully deliberated with too useful & informative contents as well as respective examples & key takeaways such as "What is NMR–Spectroscopy" "question and its answers", Structure determination & elucidation of Organic compounds, significance of NMR in chemical sciences etc. & the participants were informed subsequently & simultaneously. The following were the deliverables of the Talk of session-I

- Nuclear magnetic resonance spectroscopy (NMR), known as NMR spectroscopy or magnetic resonance spectroscopy (MRS), which is a technique to observe and analyze magnetic fields around atomic nuclei.
- This is a type of spectroscopic technique which is based on the absorption of electromagnetic radiation in the radio frequency region of 4 to 900 MHz by nuclei of the atoms.

- Now a days NMR has become the very important technique for the determination of structure of organic compounds, hence NMR has various significant aspects.
- Among all the spectroscopic methods, this is the only method for which a complete analysis and interpretation of the entire spectrum is normally expected.
- Signals were demonstrated by taking examples of 1 bromo ethane.
- NMR spectroscopy is routinely used by chemists to study chemical structure using simple one-dimensional techniques. Two-dimensional techniques are used to determine the structure of more complicated molecules.

(B)Report For: Session (II): Date:24/09/2020 (Lecture-31):

Title: A Tribute to Acharya Prafulla Chandra Ray-Father of Indian Chemistry & Optical Sensing platform opportunity and challenges

Resource Person/Speaker: Dr G. K Patra, Professor, Department of Chemistry, Guru Ghasidas Vishvavidyalaya Bilaspur.

Lecture – 31

In this session The honourable Resource Person Dr G. K Patra, Professor, Department of Chemistry, Guru Ghasidas Vishvavidyalaya Bilaspur, began his lecture with a Tribute to Acharya Prafulla Chandra Ray –Father of Indian chemistry and Started the session with an introduction & explanation of the History of Hindu Chemistry' which is one of the Rare book & one of the significant as well as important books published in twentieth century. His lecture covered the various key aspects & crucial features of Acharya Prafulla Chandra Ray such as...'Sir Prafulla Chandra Ray was the author of this book History of Hindu Chemistry & also a Chemist by profession & greatly gave his contribution to the field of Rasashastra . He was a very great teacher who donated his whole salary to students interested for the study. Further in his lecture, Prof Patra focussed on Some key features about the research areas of Acharyaji which were search for the elements missing in the periodic table. In 1896 he published a paper on presentation of a new stable chemical compound: Mercurous Nitrate. Ray developed a new method for the synthesis of Ammonium Nitrate. Ray wrote more than 100 papers, some in collaboration with his students on Mercury salts and related compounds. Moreover, Prof. Patra also featured the importance of Chemistry & chemical Sciences as a CENTRAL SCIENCE linked to many more other fields of Sciences. Thereafter He also elaborated & described about the respective opportunities & Challenges towards Optical Sensing Platform.

Mentioned below are the significant major points & key takeaways of the Lecture 31 deliberated by the respected Resource Person/Speaker of Session-II Prof G.K. Patra regarding Tribute to Acharya Prafulla Chandra Ray & Optical Sensors:

- History of Hindu Chemistry
- History of Acharya Prafulla Chandra Ray

- Chemistry as a Central Science
- Optical Sensors: Challenges & Opportunities
- Chemosensors
- Colorimetric sensors : metal ligand and internal charge transfer
- Fluorometric sensor : Active unit Fluorophore signalling via fluorescence change.
- Pet process
- C= N Isomerisation
- Benzo hyrazide Schiff base chemosensor and its advantages.
- Discussion about probable sensing mechanism.

  In last section of his lecture he concluded that He synthesized a series of novel , flexible and multifunctional Benzo-Hydrazide based Schiff's base receptor which contains suitable site for cation sensing.The Lecture was too interesting & informative

Report Prepared & Submitted by

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ONLINE REFRESHER COURSE IN CHEMISTRY

NEW TRENDS OF TEACHING AND RESEARCH IN CHEMISTRY

(14th – 26th Sept., 2020)

Organised by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur (C.G.)

Lecture Title : " Development of Chemistry OERs for Blended and Flipped Classroom Teaching"

(24th September, 2020; 16:00-17:30, Lecture no.32)

Speaker – Dr. Vimal Rarh

In her inspiring lecture, **Dr. Vimal Rarh**, Coordinator, National Resource Centre of Chemistry of MHRD, Project Head & Joint Director, Guru Angad Dev Teaching Learning Centre of MHRD, SGTB ,Khalsa College, University of Delhi, Delhi has introduced the more interesting topics ***Development of Chemistry OERs for Blended and Flipped Classroom Teaching***. She has enlightened his lecture the e-content that is consists of static content and multimedia enrichment. Static content containing Text additions, quizzes, graphics, images etc. and multimedia enrichment containing audio, video animations, simulations etc. Future of good e- contents based on self assessment, self learning, highly interactive etc. Modular format of e-content is most important for a now a days. She has lucidly explained about the development of static content among four quadrant format, it will be extensively utilized for e-PG path shala. More over she has explained E-content as four quadrant format, four quadrant format of MOOCs on Swayam, static content development related to copy right issue, open education resources and guidelines, plagiarism, violation of copy right, fair use guidelines etc. Another new thing like open educational resources (OERs) which includes full courses, curricula, course materials etc. Some examples of OERs are CEC, NTPEL, SWAYAM, National Science digital library project. API related to requirement for the promotion of teachers under CAS in college/university departments. Teacher e-kit 2.0 that consists of four quadrant She has clarified nicely as Teachers manual in quadrant I, Teachers presentation and video for flipped class room in quadrant II , Teachers assignment in quadrant III and teacher new more in quadrant IV. At the end of the lecture some participants asked her different query relating to the topics in the interaction session. All participants have fully satisfied for her well interactions.

Report Submitted by

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ONLINE REFRESHER COURSE IN CHEMISTRY

NEW TRENDS OF TEACHING AND RESEARCH IN CHEMISTRY

(14th – 26th Sept., 2020)

Organised by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur (C.G.)

RESEARCH PROJECT PRESENTATION (24th September, 2020; Time-- 14:15 -15:45)

Speaker – Group A, B, C and D Participants.

Research Project Presentation Title of the following groups

Group- A : "Room-Temperature Synthesis of Air Stable Cobalt Nanoparticles and Their Use as a Recyclable Catalyst towards Degradation Studies of Imidacloprid Pesticide"

Group- B : "An Alternative Pro-drug design of Aspirin"

Group- C : "Lanthanide-β-diketonates : Synthesis, Characterization, Photopysical Properties and Applications "

Group- D : "Kinetic Studies of Organic Substrate by Cr(VI) in Presence of Catalyst in Aqueous Micellar Acid Media"

In the presence of Expert member Dr. Kamlesh Shrivas and Course Co-ordinator Prof. Kallol K. Ghosh , four groups participants like Group-A, Group-B, Group C and Group-D have presented research project very nicely. All participants have clearly and spontaneously delivered the points regarding Introduction, historical background, Objectives, Methodology, Analysis and Interpretations, Conclusion and References etc. At the end of the project presentation of each group, expert member asked different types of questions separately each to all the participants relating to the topics in the interaction session. As per opinion of the expert member, the project presentation by the respective group members is up to the level of bench mark and quite satisfactory on records.

Report Submitted by

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On Line Refresher Course in Chemistry, HRDC
Pt. Ravishankar Shukla University, Raipur
Sept. 14-26, 2020

Lecture Title: "Atmospheric Chemistry: Analytical Aspects" (Friday September 25, 2020, **10:30 to 12:00,** Lecture -33)

Speaker: Prof. M. K. Deb

In his inspiring lecture, Dr. M. K. Deb, Professor, School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur (C.G.) introduced the participants to the idea regarding atmospheric chemistry. He described the pollutants for which sampling and analytical techniques to be discussed are some criteria pollutants viz. SO_2, NOx, O_3, NMHC, CO, BTX, SPM, RSPM and some other important chemical species. In addition, methods for meteorological parameters such as wind speed, direction, temperature, solar radiation and relative humidity will also be discussed along with wind rose plotting methods. The rationale for selecting these pollutants is that they are ubiquitous in urban air, widely recognized as posing a potential risk to population health and they commonly regulated at national and international level.

During ambient air pollutants sampling, it is also necessary to collect information on qualitative and quantitative data on the local sources of air pollution, topography, population distribution, land use pattern, climatology, etc, depending upon the objectives of the survey or measurement campaign. For example, an area map to locate pollution sources and monitoring locations, sources of pollution situated at far distances, etc. and other relevant data that describe the behavior of atmosphere for a specific pollutant. Through his intuitive speech he pointed out and describe during analyze air pollutants by the following concepts:

- National ambient air quality standard
- Pollutants data from Central pollution control board 2006
- AQI categories pollutants and health breakpoints in India for NO_2, O_3, SO_2, NH_3, Pb
- National Air Quality Monitoring Programme (NAMP) –Present scenario for 424 operating stations in 175 cities or town since 1982
- Monitoring of air pollutants where parameters monitored are (i) Pollutants (ii) Velocity (iii) Temperature and (iv) Pressure.
- Types of ambient monitoring stations and these descriptions such as: Downtown pedestrian exposure stations (ii) Downtown neighborhood exposure stations. (iii) Residential population exposure stations (iv) Mesoscale stations (v) Non-urban station (vi) Specialize source survey station with location of stations.
- Metrological parameters with different metrological centers from Srinagar to Gangtok
- Aerosol Sampler (Cascade Impactor type)
- Aerosol Sampling, Gravimetric and chemical analysis
- Quantitative determination of more than 60 metals or metalloid elements.
- Analytical description of Pb determination
- Gaseous pollutants monitoring analyze by the most common technique including spectrophotometry, chemiuminescence, Gas-chromatography wit flame ionization

detector (GC-FID), Gas-chromatography mass spectrometry (GC-MS) and Fourier Transform Infrared spectrometer (FTIR).

- Modified West-Gaeke Spectrophoto metric method
- Chemiuminescence, Gas-chromatography technique
- The Versatility of TD-A major advantage of thermal description is that it can be applied to such a wide range of analytes and samples
- Flame ionization Detector (FID), Nitrogen Phosphorous detector (NPD), Electron capture Detector (ECD), Mass Detector (MS).

Report Submitted By
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On Line Refresher Course in Chemistry, HRDC
Pt. Ravishankar Shukla University, Raipur
Sept. 14-26, 2020

Lecture Title: "Imperfections in solids" (Friday September 25, 2020, **12:15 to 13:45, session II,** Lecture -34)
Speaker: Prof. Anand S. Aswar

Prof. Anand S. Aswar, Professor & Head, Department of Chemistry, Sant Gadge Baba Amravati University, Amravati- 444602, given his lecture on 25th of September (Monday session IV, 4:00 to 5:30) with the topic Imperfection of Solids in which he described the classification of Defects. Today he continued his same topic which is nonstoichiometric defects and in his inspiring lecture, Prof. Anand S. Aswar covered all types of crystal defects. Through his intuitive speech he explained the following concepts:

- Colour centre of defects: This type of defect impart color to an otherwise colorless crystal, Ionic crystals such as NaCl, KCl etc in pure state, without imperfections are transparent throughout the visible region of spectrum. However, the impure salts are often coloured because energy is absorbed in certain regions of the visible spectrum owing to the presence of various impurities and point defects. A color center is, therefore lattice defect which absorb visible light.
- Types of color centers: (i) electricnic centres (F center, F_A center and R_A center) (ii) Hole center (H center, V center). F-centre, Farbenzentre (German Farben= colour, Zentre =centre) Is a non stochiometric defect due to uptake of large no of Na+ ions that stay at

  the surface of the crystal and e- diffuse into the crystal. F-centre is a single trapped electron which has an unpaired spin therefore exhibits paramagnetic moment. The study of color centre is carried out by ESR spectroscopy. The Hole-center is formed by heating, viz. NaCl in Cl_2 gas. In this case a $[Cl_2]^-$ ion is formed and occupies a single anion site. While in case of V center $[Cl_2]^-$ ion occupies at two sites. Thus, the molecular chloride ion occupies one site in H- center and 2 sites in V-center. F-Centers and H-centers are perfectly complementary; if they meet, they cancel one another.
- Ways of creating colour center: Heating the crystal in the vapour of the metal. Introduction of Impurities.
- Application of color centers: Color centers have been under investigation for many years. Theoretical studies guided by detailed experimental work have yielded a deep understanding of specific centers. The crystals in which color centers appear tend to be transparent to light and to microwaves. Consequently, experiments which can be carried out include optical spectroscopy, luminescence and Raman scattering, magnetic circular dichroism, magnetic resonance, and electro modulation. Color centers find practical application in radiation dosimeters; schemes have been proposed to use color centers in high-density memory devices; and tunable lasers have been made from crystals containing color centers. The illustration shows the absorption bands due to

color centers produced in potassium bromide by exposure of the crystal at the temperature of liquid nitrogen (81 K) to intense penetrating x-rays. Several prominent bands appear as a result of the irradiation. The *F*-band appears at 600 nanometers and the so-called *V*-bands appear in the ultraviolet

- Line Defects: When a lattice defect is confined to a small region in two dimensions, it is called a line defect. They are called dislocations i.e. the deviation from the ideal arrangement exists in the entire row of lattice points the defect is called as line defect. Dislocations are produced when one region of crystal surface is slipped with respect to other region and dislocation line represents the boundary between the two regions. Dislocations are an extremely important class of crystal defect. They are responsible for the relative weakness of pure metals and in certain cases for just opposite effect of

  extra hardness. Dislocations are responsible for the useful property like mechanical, ductility in metals, ceramics and crystalline polymers. They also explain the phenomenon

  of work hardening. A line defect is a lattice distortion created about a line formed during solidification process, by plastic deformation, by vacancy condensation or atomic

  mismatch in solid solutions. They are of two types: Edge Dislocation and Screw Dislocation.
- Edge dislocation: extra half-plane of atoms inserted in a crystal structure or missing half plane of atoms.
- Screw dislocation: It can be thought of as created by cutting the crystal part way and shearing down one part relative to other by one atomic spacing.
  Spiral planar ramp resulting from shear deformation.
- Observation od Dislocations: Dislocations can be made to observe directly or can be estimated by different techniques based on destructive or non-destructive method.
  (i) Method based on Growth Spirals (ii) Method Based on Etch Pits (iii) ooptical and electron-optical methods (iv) Decoration method (v) X-ray Diffraction Topography.
- Surface Imperfections: Surface imperfections arise from a change in the stacking of

  atomic planes on or across a boundary. The change may be one of the orientations or of

  the stacking sequence of atomic planes. In geometric concept, surface imperfections are two- dimensional. They are of two types external and internal surface imperfections.

- External surface Imperfection: They are the imperfections represented by a boundary. At

  the boundary the atomic bonds are terminated. The atoms on the surface cannot be compared with the atoms within the crystal. The reason is that the surface atoms have neighbors on one side only. Whereas the atoms inside the crystal have neighbors on either sides. This is shown in figure. Since these surface atoms are not surrounded by others, they possess higher energy than that of internal atom.

- Lineage boundary: It is the boundary between two adjacent perfect regions in the same crystal that are slightly tilted with respect to one another (less than 10) the boundary is said to be tilt boundary.
- Grain boundaries: A crystal is made up of a large number of small grains or crystallites which are single crystal; the grain boundary is the boundary between two crystals in a polycrystalline solid.
- High and low angle boundaries: high angle grain boundaries (HAGBs) whose misorientation is greater than about 10 degrees. Low angle grain boundaries (LAGBs) are those with a misorientation less than about 10 degrees.

- Tilt Boundary: Edge dislocation Series of edge dislocations. Low angle grain boundary: an array of aligned edge dislocations.
- Grain Boundaries: Present paths for atoms to diffuse into the material and scatter light through transparent materials to make them opaque. The boundaries limit the lengths and motions of dislocations that can move. That means that smaller grains (more grain boundary surface area) strengthens materials. The size of grains can be controlled by the cooling rate. Rapid cooling produces smaller grains. Large grains result in low strength materials. Any defect in the regular lattice disrupts the motion of dislocations.
- Twin Boundary: A special type of grain boundary across which there exists a mirror image of the crystal lattice. It is produced by mechanical shear stresses and/or annealing some materials.
- Other defects were explained: Sub grain boundary, Anti phase boundaries, Stacking Faults, Bulk or Volume Defects, Spinel.

Report Submitted By
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Uttarpara,W.B.

Date: Sept 25, 2020, Time: 16.00-17.30

In the concluding session there were project presentations by the participants (of Group E, F, G and H). The thirty six (36) participants were present and the following participants presented their project by group wise (group work) ----

GROUP E to H
25 th. September 16.00-17.30

GROUP E

21	Mukesh Kumar Tyagi	mukeshtyagi57@gmail.com	9165754661	**Title:** "Study of Factors affecting Rusting". They well described theory, methodology, analysis and interpretation of factors affecting rusting. Also, they illustrated different types of corrosion mechanism and common methods of rusting.
22	Neeraj	drneerajmoti@gmail.com	9431109243	
23	Rama Sarojinee	rama.sarojinee@gmail.com	9617660383	
24	Rashmi Verma	rashmi.rashi.verma@gmail.com	7752403268	
25	Rita Bajpai	bajpaishiva.bajpai4@gmail.com	9479001579	

GROUP F

26	Rohit Kumar Bargah	rohitbargah1978@gmail.com	9755387988	**Title:** "Organic Fertilizer" They explained the types and benefits of the fertilizers and manures are of great importance in soil fertility, They well explained methods and applications of Fym as well.
27	Samir Kumar Mandal	samirmandal2004@gmail.com	9433356499 / 7602906406	
28	Sandeep Kumar Tandon	tandonsandeep03@gmail.com	9407953990	
29	Sandhya Patre	sandhya.patre22@gmail.com	9926372988	
30	Sanjay Kumar Jain	jainsk77@yahoo.com	9424184225	

GROUP G

31	Saugata Konar	saugata.konar@gmail.com	9874247409/9832859715	**Title:** "Metal Organic Frameworks (MOF's): Present Research and Future Scope" They well explained objectives of the project, and focused on different synthetic route of MOF, showed verity of different kinds of examples of MOF's. They demonstrated different kinds of applications of MOF's and its future aspects very well.
32	Shabir Hussain Lone	chemshabir@gmail.com	9596484654	
33	Shilpa Yadav	shilpayadav23j@gmail.com	7987943371	
34	Sougata Sarkar	sougata.sarkar81@gmail.com	9477402759	
35	Sudip Kumar De	sudipkde@gmail.com	9831432757	

GROUP H

36	Sumit Srivastava	sumitchm@gmail.com	07781252755; 8010731778; 7646952005	**Title: "**Waste water treatment using adsorbents like zeolites". Firstly, they well explained origin of the problem, and elucidated introduction about zeolites and its different nanosized synthesis, characterization etc.
37	***Supratim Suin (left from this course)***	supratim.ic@gmail.com	9735304783	
38	Vitthal Nanaji Gowardipe	vitthalgowardipe@gmail.com	9421877106	
39	Waheed Ahmad Khanday	khanday.waheed@gmail.com	9906845272	
40	Yogita Thakur	yogita.thakur8@gmail.com	9827839678	

Report submitted by

Dr. Saugata Konar

Assistant Professor

The Bhawanipur Education Society College, Kolkata, WB

Human Resource Development Center

Pt. Ravishankar Shukla University Raipur (C.G.)

REFRESHER COURSE (CHEMISTRY) 2020 **" New Trends of Teaching and Research in Chemistry "**

14th – 26th September 2020

Lecture Title: "A Cursory Glance to the domain of Colloid and Interface Science with Special Reference to Nanostructured System"

(Saturday September 26, 10:30 AM – 12:00 PM)

Speaker: Dr. Amiya Kumar Panda

In his inspiring lecture, Dr. Amiya Kumar Panda, Department of Chemistry Vidyasagar University Midnapore (West Bengal) introduced the participants to the cursory domain of colloid and interface science to reference to nanostructure. In the starting of lecture his explain the division, branch and founders of physical chemistry. In present day so many research going to bases on nanoparticles and its necessary for us to know the behavior of matter special reference to colloidal and interfacial properties. Post completion of this lecture the participants learn how to approach material like nanoparticles to studies as synthesis and chemical kinetic. Through her intuitive speech Dr. Amiya Kumar Panda also collaborate to all participants and given the satisfy answer of their queries.

So from this lecture, the deliverable are as follows:

- Colloids and interfaces are intimately related.
- Colloidal system as system which are dominated by interfacial effect rather than bulk properties.
- Some tidbits from the history of colloids.
- Research on colloid science in India.
- Synthesis of nanocrystals.
- Kinetic studies of colloidal and NPs system.

Report submitted by

Aatma ram verma

Assistant professor (chemistry)
Shashidhar Panda govt. college sariya,
Dist – Raigarh (C.G.), 496554

Human Resource Development Center

Pt. Ravishankar Shukla University Raipur (C.G.)

REFRESHER COURSE (CHEMISTRY) 2020 **" New Trends of Teaching and Research in Chemistry "**

14th – 26th September 2020

Lecture Title: "Significance of Ethics in Research" (Saturday September 26, 12:00 PM – 01:30 PM)

Speaker: Prof. S. K. Mehta

In his inspiring lecture, **Prof. S. K. Mehta**, Department of Chemistry Punjab University Chandigarh (Punjab) introduced the participants to the important role of ethics in research. In the starting of lecture his explain the what is ethics and research. Now a day quality researches are available and important of ethics in these research play outstanding role to serve better result of our society. In lecture sir discuss core part of research which is guideline for ethical aspect of study. Through her intuitive speech **Prof. S. K. Mehta** also collaborate to all participants and given the satisfy answer of their queries.

So from this lecture, the deliverable are as follows:

- What ethics is and what it is not
- Relevance of research
- Historical events and development of code of ethics.
- Importance of ethics in research.
- Ethical principles guide research
- Role of peer, reviewers and researchers.

Report submitted by

Aatma ram verma

Assistant professor (chemistry)
Shashidhar Panda govt. college sariya,
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ONLINE

REFRESHER COURSE IN

CHEMISTRY

New Trends of Teaching and Research in Chemistry

14th-26th September, 2020

Organized by

Human Resource Development Centre,(HRDC) Pt. Ravishankar Shukla University, Raipur (C.G.)

Report For: Session (III & Valedictory session) : Date-26/09/2020 (Saturday):

(A)Report For: Session (III) : Date:26/09/20 (Lecture42):

Title- SURFACE & MATERIALS CHARACTERIZATION TECHNIQUES

Resource Person/Speaker: Dr. Kamalesh Kumar Shrivas, Associate Professor, School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, C.G.

End Session Lecture

The 3rd Session of 26th Sept, 220, the last Lecture of the Online Refresher Course-2020 in Chemistry started at 2.20 p.m. with the dynamic deliberation/talk by Dr. Kamalesh Kumar Shrivas, Associate Professor, School of Science in Chemistry, Pt. Ravishankar Shukla University, Raipur, on Surface & Material Characterization Techniques using the teaching tools of his beautiful & effective presentation slides of Basic Principles of Spectroscopy. After introducing the Participants & giving the brief information regarding the Principle of Spectroscopy, he further explained the various Surface Analysis Techniques through a nice schematic diagrams & pictures giving suitable examples. Thereafter his lecture involved a significant focus on Characterization of Thin films including Structure, Composition, Electronic Structure as well as the common types of Electron Spectroscopic Methods for Analysis of Surfaces. His informative words on these methods & also covered the following aspects as the key points:

- Auger Electron Spectroscopy (AES)
- Electron Misroscopy
- Xray Photoelectron Spectroscopy(XPS)
- Atomic Force Microscopy
- Princip[les of AES: two step process
- Principles of XPS
- Binding Energy

- Mass Spectrometry & its Application in biological, chemical & material sciences
- Characterization of Thin films

(B)Report For: Valedictory Session: Date:26/09/2020:

The Valedictory Session of the Online Refresher Course in Chemistry on **New Trends of Teaching and Research in Chemistry** started sharp at 4.00 p.m. during the post noon session on 26th Sept, 220, in the warm presence of Hon. Vice Chencellor of the University (PRSU), Respected Director, HRDC, PRSU, coordinator, RC-2020 & all other respected dignitaries & eminent participants. Further, moving towards the successful completion of the Refresher course the session began with marvellous feedback & sharing of experiences by the Course Participants throughout the duration of the refresher course. Thereafter, the Hon, Vice Chancellor of PRSU delivered his address.

Report Prepared & Submitted by

Dr Jayati Chatterjee Mitra
Associate Professor, Department of Chemistry
Coordinator, IQAC, 8871275772, jc.bilaspur@gmail.com
Dr C V Raman University
Kargi Road Kota Bilaspur (CG)

Annexure -III

Online Refresher Course in Chemistry

HRDC, Pt. Ravishankar Shukla University, Raipur

TOPICS OF MICROTEACHING

18th and 19th September 2020

S. No.	Name of the Participant	Email address	Contact Number	Title /Topic
1.	Aarati Sao	aartisao89@gmail.com	9669892955	Crystal field splitting of d-orbitals in octahedral complexes
2.	Aatma Ram Verma	a.r.verma.09@gmail.com	9691722138	Photochemistry
3.	Alka Shukla	shukla.alka0721@gmail.com	9827999283, 9340059669	Fast reaction
4.	Amit Das	amitdasdeb@gmail.com	9733908702	Electron affinity and its variation trend in the periodic table.
5.	Archana Asatkar	asatkar@gmail.com	7623995917	NMR- Introduction in Brief
6.	Ashutosh Pal	ashupal33@gmail.com	9434889898	Structure of D(+)-glucose (up to backgrounds of ring structure)
7.	Averi Guha	averiguha2000@yahoo.com	9674726023	Derivations and Applications of Born Lande Equation
8.	Bameshwar Prasad Sinha	drbpsinha55@gmail.com	9458997626	UV spectroscopy
9.	Bharat Chandoba Sonkamble	bsonkamble88@gmail.com	07588894582	Green Chemistry
10.	Bhaskar Sharma	bsharma05@gmail.com	7999182918	Polymers and their applications
11.	George T M	georgtm@gmail.com	0484-2477602, 9037312392	"Photoelectric effect"
12.	Gourisankar Roymahapatra	gourisankar1978@gmail.com	9434452931	'Correlation between COD and BOD analysis'
13.	Hena Paul	hena_paul84@rediffmail.com	9433925830; 6296373744	Paper Chromatographic Separation
14.	Indrajit Chakraborty	indraji2001@gmail.com	8001096953	Stereogenicity *vs* Stereotopicity: A Broad Overview
15.	Jayati Chatterjee Mitra	jc.bilaspur@gmail.com	08871275772 , 07752419254	“Separation techniques with special reference to Solvent Extraction”
16.	Meena Chakraborty	chakrabortymeena@gmail.com	9826772191	"Crystal Field Theory"
17.	Monirul Islam	michem989@gmail.com	9434632589	" Covalency In Ionic Bonds : Fajans' Rules "
18.	Mukesh Kumar Tyagi	mukeshtyagi57@gmail.com	9165754661	Stereochemistry
19.	Neeraj	drneerajmoti@gmail.com	9431109243	Auto ionization of water- A pictorial perception

20.	Rama Sarojinee	rama.sarojinee@gmail.com	9617660383	Significance of Activation Energy
21.	Rashmi Verma	rashmi.rashi.verma@gmail.com	7752403268	Polymer and its type
22.	Rita Bajpai	bajpaishiva.bajpai4@gmail.com	9479001579	Term symbol
23.	Rohit Kumar Bargah	rohitbargah1978@gmail.com	9755387988	Green Chemistry and it's Basic Principle
24.	Samir Kumar Mandal	samirmandal2004@gmail.com	9433356499 / 7602906406	Significance of Activation Energy
25.	Sandeep Kumar Tandon	tandonsandeep03@gmail.com	9407953990	Chemical Kinetics
26.	Sandhya Patre	sandhya.patre22@gmail.com	9926372988	Intermolecular Forces
27.	Sanjay Kumar Jain	jainsk77@yahoo.com	9424184225	Lanthanide Contraction: Causes and Consequences '
28.	Saugata Konar	saugata.konar@gmail.com	9874247409/9832859715	Introduction to Acids and Bases
29.	Shabir Hussain Lone	chemshabir@gmail.com	9596484654	Hand-Sanitizers: Chemistry and Role
30.	Shilpa Yadav	shilpayadav23j@gmail.com	7987943371	Crystal Field Theory of Octahedral Complex
31.	Sougata Sarkar	sougata.sarkar81@gmail.com	9477402759	Dissolution of Noble Metals: Aqua Regia and Beyonds
32.	Sudip Kumar De	sudipkde@gmail.com	9831432757	VSEPR Theory
33.	Sumit Srivastava	sumitchm@gmail.com	07781252755; 8010731778; 7646952005	Coordination Polymers for the detection of Hazardous Materials
34.	Vitthal Nanaji Gowardipe	vitthalgowardipe@gmail.com	9421877106	Amines
35.	Waheed Ahmad Khanday	khanday.waheed@gmail.com	9906845272	Waste Management
36.	Yogita Thakur	yogita.thakur8@gmail.com	9827839678	Crystal Field Theory for Octahedral Complex

Annexure -IV

Online Refresher Course in Chemistry

HRDC, Pt. Ravishankar Shukla University, Raipur

Topics of Seminar Presentation

23rd September 2020

S. No.	Name of the Participant	Email address	Contact Number	Topic of the Seminar
1.	Aarati Sao	aartisao89@gmail.com	9669892955	online teaching learning
2.	Aatma Ram Verma	a.r.verma.09@gmail.com	9691722138	National Education Policy 2020
3.	Alka Shukla	shukla.alka0721@gmail.com	9827999283, 9340059669	Covid 19 and Role of Chemistry
4.	Amit Das	amitdasdeb@gmail.com	9733908702	Online Teaching and Learning'.
5.	Archana Asatkar	asatkar@gmail.com	7623995917	National Education Policy 2020
6.	Ashutosh Pal	ashupal33@gmail.com	9434889898	On line Teaching and Learning
7.	Averi Guha	averiguha2000@yahoo.com	9674726023	Covid 19 and Role of Chemistry
8.	Bameshwar Prasad Sinha	drbpsinha55@gmail.com	9458997626	New Education Policy-2020
9.	Bharat Chandoba Sonkamble	bsonkamble88@gmail.com	07588894582	Covid 19 and Role of Chemistry
10.	Bhaskar Sharma	bsharma05@gmail.com	7999182918	covid 19 and the role of chemistry
11.	George T M	georgtm@gmail.com	0484-2477602, 9037312392	Research Oriented Teaching
12.	Gourisankar Roymahapatra	gourisankar1978@gmail.com	9434452931	Research Oriented Teaching
13.	Hena Paul	hena_paul84@rediffmail.com	9433925830; 6296373744	On line Teaching and Learning
14.	Indrajit Chakraborty	indraji2001@gmail.com	8001096953	Online Teaching & Learning
15.	Jayati Chatterjee Mitra	jc.bilaspur@gmail.com	08871275772 , 07752419254	National Education Policy-2020
16.	Meena Chakraborty	chakrabortymeena@gmail.com	9826772191	online teaching and learning.
17.	Monirul Islam	michem989@gmail.com	9434632589	COVID 19 AND ROLE OF CHEMISTRY
18.	Mukesh Kumar Tyagi	mukeshtyagi57@gmail.com	9165754661	Covid 19 and role of Chemistry
19.	Neeraj	drneerajmoti@gmail.com	9431109243	Online Teaching and Learning
20.	Rama Sarojinee	rama.sarojinee@gmail.com	9617660383	Online Teaching and Learning
21.	Rashmi Verma	rashmi.rashi.verma@gmail.com	7752403268	Covid 19 and role of Chemistry
22.	Rita Bajpai	bajpaishiva.bajpai4@gmail.com	9479001579	Online Teaching and Learning

23.	Rohit Kumar Bargah	rohitbargah1978@gmail.com	9755387988	Covid 19 and Role of Chemistry
24.	Samir Kumar Mandal	samirmandal2004@gmail.com	9433356499 / 7602906406	Covid 19 and Role of Chemistry
25.	Sandeep Kumar Tandon	tandonsandeep03@gmail.com	9407953990	Online Teaching and Learning
26.	Sandhya Patre	sandhya.patre22@gmail.com	9926372988	National Education Policy 2020
27.	Sanjay Kumar Jain	jainsk77@yahoo.com	9424184225	National Education Policy 2020
28.	Saugata Konar	saugata.konar@gmail.com	9874247409/9832859715	Online Teaching and Learning
29.	Shabir Hussain Lone	chemshabir@gmail.com	9596484654	National Education Policy 2020
30.	Shilpa Yadav	shilpayadav23j@gmail.com	7987943371	Covid 19 and Role of Chemistry
31.	Sougata Sarkar	sougata.sarkar81@gmail.com	9477402759	Research Oriented Teaching
32.	Sudip Kumar De	sudipkde@gmail.com	9831432757	National Education Policy 2020
33.	Sumit Srivastava	sumitchm@gmail.com	07781252755; 8010731778; 7646952005	National Education Policy 2020
34.	Vitthal Nanaji Gowardipe	vitthalgowardipe@gmail.com	9421877106	Online Teaching and Learning
35.	Waheed Ahmad Khanday	khanday.waheed@gmail.com	9906845272	Covid 19 and Role of Chemistry
36.	Yogita Thakur	yogita.thakur8@gmail.com	9827839678	National Education Policy 2020

Annexure -V

Online Refresher Course in Chemistry

HRDC, Pt. Ravishankar Shukla University, Raipur

Topics of Project Presentation

24th and 25th September 2020

S. No.	Name of the Participant	Email address	Contact Number	Title of the Project
		Group A		
1	Aarati Sao	aartisao89@gmail.com	9669892955	Understanding nature through molecular interactions
2	Aatma Ram Verma	a.r.verma.09@gmail.com	9691722138	
3	Alka Shukla	shukla.alka0721@gmail.com	9827999283, 9340059669	
4	Amit Das	amitdasdeb@gmail.com	9733908702	
5	Archana Asatkar	asatkar@gmail.com	7623995917	
		GROUP B		
6	Ashutosh Pal	ashupal33@gmail.com	9434889898	An alternative prodrug design of Aspirin
7	Averi Guha	averiguha2000@yahoo.com	9674726023	
8	Bameshwar Prasad Sinha	drbpsinha55@gmail.com	9458997626	
9	Bharat Chandoba Sonkamble	bsonkamble88@gmail.com	07588894582	
		GROUP C		
10	Bhaskar Sharma	bsharma05@gmail.com	7999182918	Lanthanide-β diketonates: Synthesis, Characterization, Photopysical Properties and Applications
11	George T M	georgtm@gmail.com	0484-2477602, 9037312392	
12	Gourisankar Roymahapatra	gourisankar1978@gmail.com	9434452931	
13	Hena Paul	hena_paul84@rediffmail.com	9433925830; 6296373744	
		GROUP D		
14	Indrajit Chakraborty	indraji2001@gmail.com	8001096953	Kinetic Studies of Organic Substrate by Cr(VI) in presence of Catalyst in Aqueous Micellar Acid Media
15	Jayati Chatterjee Mitra	jc.bilaspur@gmail.com	08871275772 , 07752419254	
16	Meena Chakraborty	chakrabortymeena@gmail.com	9826772191	
17	Monirul Islam	michem989@gmail.com	9434632589	

GROUP E				
18	Mukesh Kumar Tyagi	mukeshtyagi57@gmail.com	9165754661	Study of factors affecting rusting
19	Neeraj	drneerajmoti@gmail.com	9431109243	
20	Rama Sarojinee	rama.sarojinee@gmail.com	9617660383	
21	Rashmi Verma	rashmi.rashi.verma@gmail.com	7752403268	
22	Rita Bajpai	bajpaishiva.bajpai4@gmail.com	9479001579	
GROUP F				
23	Rohit Kumar Bargah	rohitbargah1978@gmail.com	9755387988	Organic Fertilizer
24	Samir Kumar Mandal	samirmandal2004@gmail.com	9433356499 / 7602906406	
25	Sandeep Kumar Tandon	tandonsandeep03@gmail.com	9407953990	
26	Sandhya Patre	sandhya.patre22@gmail.com	9926372988	
27	Sanjay Kumar Jain	jainsk77@yahoo.com	9424184225	
GROUP G				
28	Saugata Konar	saugata.konar@gmail.com	9874247409/9832859715	Metal Organic Frameworks: Present Research and Future Scope
29	Shabir Hussain Lone	chemshabir@gmail.com	9596484654	
30	Shilpa Yadav	shilpayadav23j@gmail.com	7987943371	
31	Sougata Sarkar	sougata.sarkar81@gmail.com	9477402759	
32	Sudip Kumar De	sudipkde@gmail.com	9831432757	
GROUP H				
33	Sumit Srivastava	sumitchm@gmail.com	07781252755; 8010731778; 7646952005	Waste water treatment using adsorbents
34	Vitthal Nanaji Gowardipe	vitthalgowardipe@gmail.com	9421877106	
35	Waheed Ahmad Khanday	khanday.waheed@gmail.com	9906845272	
36	Yogita Thakur	yogita.thakur8@gmail.com	9827839678	