

## CH P 409: PHYSICAL CHEMISTRY PRACTICALS - I

(Any 12 experiments are to be carried out)

### COURSE OUTCOME:

- Experiments have been designed which make use of the concepts of electrochemistry, thermodynamics, solution chemistry and surface chemistry.
- Students get hands on experience in use of various instruments.
- It will be able to understand the theoretical concepts.
- To learn Specific and molar refractivity, viscosity, parachor etc.

1. (a) Determination of transport number of  $\text{Cd}^{2+}$  and  $\text{SO}_4^{2-}$  ions by EMF method.  
(b) Determination of thermodynamic parameters of a cell reaction by EMF method.
2. Determination of pK values phosphoric acid by potentiometric/pH metric method
3. Potentiometric titration of halides in mixtures ( $\text{Cl}^-$ ,  $\text{Br}^-$  and  $\text{I}^-$ ) with silver nitrate
4. Verification of Nernst equation for  $\text{Ag}^+$ ,  $\text{Cu}^{2+}$  and  $\text{Zn}^{2+}$  species.
5. Determination of Solubility product and the Instability constant by potentiometric method.
6. Potentiometric determination of solubility of insoluble silver halide and the standard electrode potential using quinhydrone electrode.
7. Conductometric titrations of displacement and precipitation reactions.
8. Determination of equivalent conductance and dissociation constants of weak acid and base.
9. Determination of solubility of lead iodide at different T & hence molar heat of solution
11. Determination of hydrolysis constant of aniline hydrochloride.
11. Determination of degree of hydrolysis of  $\text{CH}_3\text{CO}_2\text{Na}$  and  $\text{NH}_4\text{Cl}$  by conductivity method.
12. Determination of Critical Micelle concentration by conductometric method.
13. Determination of pH of buffer solutions with a pH meter & evaluation of  $\text{pK}_a$  of acids
14. Verification of Walden's rule (relation between viscosity of a solution and the electrical conductivity).
15. Study of variation of viscosity of a liquid with temperature
16. Determination of parachor value for  $\text{CH}_2$  group and some elements by Surface Tension method,
17. Determination of the composition of a solution by S.T measurement
18. Determination of the Critical Micelle Concentration by surface tension/spectrophotometric measurements.
19. Determination of the composition of Zinc Ferrocyanide complex by Potentiometric titrations.
20. Determination of Specific and molar refractivity of liquids and paracor value of a species by refractometric method.

Any other relevant experiments of interest.

### REFERENCES:

1. Findlay's Practical Physical Chemistry- B. P. Levitt ( Longman, London).
2. Experiments in Physical Chemistry– James and Prichard.
3. Experimental Physical Chemistry - Daniels et al.
4. Experimental Physical Chemistry-Das & Behera (Tata McGraw Hill, New Delhi)1983.
5. Advanced Practical Physical Chemistry–Yadav (1989).
6. Experiments in Physical Chemistry–J. C. Ghosh ( Bharathi Bhavan)1974.
7. Practical Physical Chemistry-B Viswanathan & P.S Raghavan,(ViVa Books, New Delhi) 2005.

# Mangalore University

Mangalagangothri - 574 199



Department of Studies in Chemistry

Organises

International Webinar

on

Frontier Research in Chemical Sciences 2020

September 10 – 12, 2020



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## Resource Persons

Alumnae of the Department



Dr. Sahana Mallya  
SRI International, USA



Dr. Rashmi Nayak  
NCL Pune, India



Dr. Shridevi S. Bhat  
New York, USA



Dr. Anitha Alanthadka  
IIT Roorkey, India



Dr. A. S. Amrutha  
RIES, Hokkaido University, Japan



Dr. Sahana Roessler  
Max-Planck Institute, Germany

## Patron

Prof. P. S. Yadapadithaya, Hon'ble Vice Chancellor

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*Coordinator*

Prof. G. K. Nagaraja  
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## Organizing Committee

Prof. Balakrishna Kalluraya

Prof. B. Narayana

Prof. Boja Poojary

Prof. Jagadeesh Prasad D.

Dr. M. R. Maddani



**Mangalore University**  
**Department of Studies in Chemistry**  
**Mangalagangothri - 574 199**



*International Webinar*  
on

**Frontier Research in Chemical Sciences 2020**

September 10 – 12, 2020

**Program Schedule**

**Thursday, 10-09-2020**

- 10.00am-10.30am Inauguration
- 10.30am-11.30am **Lecture 1: Dr. Sahana Mallya, SRI International, USA**  
Title SynJet™ – An automated chemistry platform for high throughput reaction screening and optimization
- 11.45am-12.45pm **Lecture 2: Dr. Rashmi Nayak, NCL Pune, India**  
Title Luminescent molecular liquids for large area lighting applications

**Friday, 11-09-2020**

- 10.30am-11.30am **Lecture 3: Dr. Shridevi S. Bhat, New York, USA**  
Title How nanotechnology can change the world?
- 11.45am-12.45pm **Lecture 4: Dr. Anitha Alanthadka, IIT Roorkee, India**  
Title Sustainable catalytic methodologies towards the synthesis of N-heterocyclic compounds

**Saturday, 12-09-2020**

- 10.00am-11.00am **Lecture 5: Dr. A. S. Amrutha, RIES, Hokkaido University, Japan**  
Title Targeted activation of motor protein – driven molecular transportation by visible light
- 11.15am-12.15pm **Lecture 6: Dr. Sahana Roessler, Max-Planck Institute, Germany**  
Title Spin-orbit entangled states in 4d and 5d transition element compounds
- 12.30pm-01.00pm Valedictory





Mangalore University

Department of Studies in Chemistry

International Webinar on  
Frontier Research in Chemical Sciences (FRCS 2020)



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Mangalagangothri - 574 199

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12.30pm-01.00pm	Valedictory



Department of Studies in Chemistry, Mangalore University organised an international webinar on Frontier Research in Chemical Sciences (FRCS 2020) during September 10 - 12 2020.

This webinar was very special as all the invited resource persons are Alumnae of the Department of Chemistry, Mangalore University who are actively involved in research in India and abroad. Inauguration of the webinar was done on September 10 2020. Prof. P. S. Yadapadithaya presided over the Inauguration function. After the Inauguration, Dr. Sahana Mallya, SRI International, USA delivered the first lecture on 'SynJet™ - An automated chemistry platform for high throughput reaction screening and optimization. The 2<sup>nd</sup> lecture of the Day 1 was delivered by Dr. Rashmi Nayak, NCL Pune, India on 'Luminescent molecular liquids for large area lighting applications.

On the Day 2, Dr. Shridevi S. Bhat, New York, USA delivered the first lecture on 'How nanotechnology can change the world?' Subsequently, Dr. Anitha Alanthadka, IIT Roorkee, India presented the 2<sup>nd</sup> lecture on the topic 'Sustainable catalytic methodologies towards the synthesis of N-heterocyclic compounds' On the Day 3, Dr. A. S. Amrutha, RIES, Hokkaido University, Japan delivered the lecture on 'Targeted activation of motor protein - driven molecular transportation by visible light'. The last lecture of the webinar was presented by Dr.

Sahana Roessler, Max-Planck Institute, Germany on the topic ‘Spin-orbit entangled states in 4d and 5d transition element compounds’.

Faculties of various institutions, MSc students, Guest faculties and other invitees participated in the webinar. Overall around 250 participants benefited from this webinar. Almost all the participants appreciated the organising team for arranging such a wonderful webinar. Many of the participants actively interacted with all the resource persons. After all the lectures, valedictory function was conducted. Sri K. Raju Mogaveera, Registrar, Mangalore University presided over the valedictory function.

