

Report on the 100th BRNS-IANCAS National Workshop on

“Radiochemistry and Applications of Radioisotopes”

at

Department of Chemistry

University of Kerala, Kariavattam campus, Thiruvananthapuram, Kerala

December 9-14, 2019

The 100th BRNS-IANCAS National Workshop on “**Radiochemistry and Applications of Radioisotopes**” was organized at the *Department of Chemistry, University of Kerala, Kariavattam campus, Thiruvananthapuram, Kerala*, during the period 9-14, December, 2019. Dr. Madhava B Mallia and Dr. Pranaw Kumar served as workshop coordinator and practical coordinator, respectively. Dr. Sony George, Head, Department of Chemistry, was the convenor and director of the workshop. A total of 55 participants of the workshop included faculty members and research scholars from various departments of University of Kerala, and colleges affiliated to the University of Kerala. One of the faculties was from Cochin University of Science and Technology, Kochin. All participants received a book (IANCAS publications) on “Experiments in Radiochemistry”. About 4 “Fundamentals of Radiochemistry” (IANCAS publications) books were given to the host department for distribution to its library and libraries of other departments in University of Kerala. Five books were distributed among the winners of the quiz program conducted as a part of the workshop.

The Workshop was inaugurated on 9th December, 2019, at 9:30 am, by lighting lamp by Dr. Ajayakumar P. P., Pro Vice Chancellor, University of Kerala, Sri. Suresh Babu, Distinguished Scientist & Associate Director, Health, Safety and Environment group, Bhabha Atomic Research Centre, Dr. Pradeep Kumar Pujari, Distinguished Scientist & Director, Radiochemistry and Isotope Group, Bhabha Atomic Research Centre, Dr. S. M. A. Schibli, Professor, Department of Chemistry, University of Kerala and Dr. Madhava B Mallia, Radiopharmaceuticals Division, Bhabha Atomic Research Centre. Dr. Sony George, Head, Department of Chemistry, University of Kerala, welcomed the participants. Dr. Ajayakumar P. P., Pro Vice Chancellor, University of Kerala, addressed the gathering and lauded the step taken by Department of Chemistry to conduct IANCAS workshop. He emphasized the importance of research in radioisotopes, especially for medical applications, and the need to initiate such activities in University of Kerala. Dr. Pradeep Kumar Pujari, briefly described

the activities of IANCAS and the contributions of BARC to radioisotope program in India, especially in health care sector.



Inaugural function of the 100th IANCAS workshop on ‘Radiochemistry and Application of Radioisotopes’

The address by Dr. P. K. Pujari was immediately followed by donation of instruments (one NaI(Tl) detector and one G. M. Counter) by IANCAS to the host institute. Dr. P. K. Pujari handed over the donation certificate as well as seed money cheque for Rs. 20,000/- to Dr. Sony George, Head, Department of Chemistry, in presence of honourable Pro Vice Chancellor, University of Kerala.



Address by Dr. P. K. Pujari



Dr. Sony George, Head, Department of chemistry, Kerala University, receiving instruments donated by IANCAS from Dr. P. K. Pujari, Director, RC&IG



Keynote address by Sri. Suresh Babu, Distinguished Scientist & Associate Director, Health, Safety and Environment group Bhabha Atomic Research Centre

Prof. Schibli also addressed the gathering emphasising the importance of research. Sri. Suresh Babu, Chief Guest of the Inaugural function, delivered the keynote address in which he discussed the importance of Nuclear power in the context of global warming. Dr. Madhava B Mallia delivered the vote of thanks.

The technical program of the Workshop (enclosed) comprised of 11 lectures and 4 practicals. A total of 5 resource persons conducted the workshop (list enclosed).

The lectures were held during the forenoon sessions and the afternoon sessions were dedicated for the experiments. Probably a first in IANCAS workshop, a short quiz competition was conducted every day after the two scheduled lectures. The quiz was based on the lectures on that day and the winner was decided based on the aggregate of their individual score on each day. Sri. Viju Chirayil conducted the quiz while other resource persons contributed the questions. It is pertinent to note that this program was highly appreciated by the participants of the workshop. In our opinion, the quiz competition also encouraged the participants to pay more attention to the lectures. To ignite the enthusiasm of the participants, it was announced on day one of the workshop that winner of the quiz program will receive a copy of the book “Fundamentals of Radiochemistry”. All the lectures were received very well by the participants, which was evident from the questions & answer session following each lecture and subsequent lively discussions.

As indicated in the attached program schedule, there were four experiments. The participants were divided into four groups and every group did one experiment every day. Dr. Ashok Kumar, Dr. Pranaw Kumar, Sri. Viju Chirayil and Sri. Nilesh Tawade conducted the experiments. One experiment was on determination of radioactivity in air. Along with this experiment, Dr. Ashok Kumar introduced the participants to different radiation monitoring

devices as well as personal dosimeters such as TLD, DRD etc. and discussed their working principle. Each experimental session was followed by lively discussion.

The valedictory function of 100th IANCAS workshop was on 14th December, 2019, morning, after the scheduled lecture on ‘Actinide chemistry’ by Dr. Pranaw Kumar and a ‘Mega quiz’, based on all the lectures delivered during the workshop. Though Dr. V. P. Venugopalan, Outstanding Scientist & Group Director, Biosciences group, Bhabha Atomic Research Centre, was the chief-guest for the valedictory function, due to some technical reasons he could not attend the function. Prof. Schibli, Department of Chemistry, and resource persons from BARC did the distribution of certificates to the participants and also distributed the prize to the winners of the quiz competition. A few participants, including students and faculty, shared their views about the workshop. Dr. Madhava B Mallia responded to the feedbacks wherever necessary. The Workshop was concluded with a vote of thanks by Dr. Sony George.

We had distributed feedback forms (copy attached) among participants to understand their views on workshop, workshop content (both lectures and experiments), resource persons etc. In general, participants found the lectures and practicals very interesting and, informative. There were several queries from faculties regarding conducting similar IANCAS workshops in their colleges.

Some of the important suggestions and views from the participants are summarized below.

1. More than 90% of the participants had “Very good” opinion about the lectures, resource persons as well as the IANCAS workshop as a whole.
2. One of the participant felt a lecture on waste management could have been included.
3. Most of the participants liked the idea of having a quiz on each day after the scheduled lectures.
4. One of the suggestions from the participants is to conduct IANCAS workshop in colleges offering PG courses. They felt such courses would be more useful in such places.
5. One of the participant felt ‘time management’ was ‘poor’. The participant also suggested resource persons to “modulate their voices” to make the presentations “even more effective”. This participant rated the workshop “good” to “average”.
6. One of the participants from physics background suggested to include at least one lecture on nuclear physics aspects and may be one resource person with nuclear physics background.

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on
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at Department of Chemistry, Kerala University, Trivandrum
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President, IANCAS	Dr. B. S. Tomar <i>Ex-Dir, RC&I Group, BARC</i>		
Vice President, IANCAS & Chairman Workshop	Dr. P. K. Pujari <i>Asso. Dir. RC & I Group, BARC</i> Prof. Alok Srivastava <i>Punjab University, Chandigarh</i>	pujari@barc.gov.in	022 2559 5326
Workshop Coordinators	Madhava B Mallia, SO/G, RPhD, BARC Pranaw Kumar, SO/F, FCD, BARC	mallia@barc.gov.in ; madhavmb@gmail.com pranaw@barc.gov.in ; pranaw.k@gmail.com	9324088816 9969040988
Convener and workshop director	Dr. Sony George, Asst. Prof. & Head, Department of Chemistry, University of Kerala	emailtosony@gmail.com	9446462933

Resource Persons

Name	Designation & Affiliation
Dr. Madhava B Mallia	SO/G, RPhd, BARC
Dr. Pranaw Kumar	SO/F, FCD, BARC
Dr. Ashok Kumar	SO/F, HPD, BARC
Viju Chirayil	SO/E, RPhD, BARC
Nilesh Tawade	SA/F, EECS, RCD, BARC

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Technical Programme

Date / Time	Lecture Topics	Resource Person
09.12.2019; Monday – Day 1		
10:00	Inauguration	
11:00	Keynote Address	Sri. Suresh Babu Distinguished Scientist & Associate Director, Health, Safety and Environment group Bhabha Atomic Research Centre
11:30	L1: Nuclear Stability and nuclear structure	Dr. Pradeep Kumar Pujari Distinguished Scientist & Associate Director, Radiochemistry and Isotope group Bhabha Atomic Research Centre
13:00	Lunch	
14:00	L2: Radioactivity and nuclear decay	Dr. Madhava B Mallia
14:30	Introduction to experiments E1 - GM Counter – A gas filled detector: Determination of plateau & counting statistics E2 - GM Counter – Determination of dead time E3 - Gamma-ray spectrometry using NaI(Tl) detector and shielding experiment E4 - Detection and estimation of radon in air	Sri. Nilesh Tawade Dr. Ashok Kumar
10.12.2019; Tuesday – Day 2		
10:00	L3: Interaction of Radiation with Matter	Dr. Ashok Kumar
11:15	L4: Radiation Detection and Measurement	Sri. Nilesh Tawade
12:30	Quiz	
13:00	Lunch	
14:00	Experiments & Discussions	
11.12.2019; Wednesday – Day 3		
10:00	L5: Nuclear Reactors	Dr. Pranaw Kumar
11:15	L6: Radioisotope Production	Sri. Viju Chirayil
12:30	Quiz	
13:00	Lunch	
14:30	Experiments & Discussion	
12.12.2019; Thursday – Day 4		
10:00	L7: Radioisotope Applications in Health Care	Dr. Madhava B Mallia
11:15	L8: Health Physics and Radiological Safety	Dr. Ashok Kumar
12:30	Quiz	
13:00	Lunch	
14:00	Experiments & Discussion	
13.12.2019; Friday – Day 5		
10:00	L9: Lanthanide and Actinide chemistry	Dr. Pranaw Kumar
11:15	L10: How to set up a Radiochemical Laboratory	Sri. Viju Chirayil
12:00	Quiz	
13:00	Lunch	
14:00	Experiments & Discussion	
14.12.2019; Saturday – Day 6		
10:00	L11: Application of nuclear technology for food and nutritional security	Dr. V. P. Venugopalan Outstanding Scientist & Associate Director Biosciences group Bhabha Atomic Research Centre
11:00	Valedictory Function & Distribution of Certificates	

Tea: 11:00 and 15:30 (unless mentioned otherwise)
Experiments

S.N.	Topic	Resource Person
E1	GM Counter – A Gas Filled Detector : Plateau and Statistics	Dr. Pranaw
E2	GM Counter – Determination of dead time	Sri. Viju Chirayil
E3	Gamma-ray Spectrometry using NaI(Tl) Detector and Shielding Experiment	Sri. Nilesh Tawade
E4	(a) Detection and estimation of radon in air (b) Introduction to personal monitoring devices and contamination monitoring devices	Dr. Ashok Kumar