Report on the 107th BRNS-IANCAS National Workshop on "*Radiochemistry and Applications of Radioisotopes*" at *Department of Physics, Cochin University of Science and Technology, Kochi* January 22-27, 2024

The 107th BRNS-IANCAS National Workshop on "**Radiochemistry and Applications of Radioisotopes**" was organized at the *Department of Physics*, *Cochin University of Science and Technology (CUSAT), Kochi, Kerala*, during January 22-27, 2024. Dr. Madhava B Mallia was the coordinator, and Dr. Rhine Kumar, Department of Physics, CUSAT was the convener of the Workshop. There were 61 registered participants in the workshop which included faculty members and research scholars from various departments of CUSAT and other institutes in Kerala, Tamil Nadu and Orissa.

The Workshop was inaugurated by Prof. P.G. Sankaran, Hon. Vice Chancellor, CUSAT and Dr. S. Kannan, Vice President, IANCAS. In his inaugural address, Prof. Sankaran lauded the efforts taken by Department of Physics to conduct IANCAS workshop and emphasized the importance of research in radioisotopes, especially for medical applications. Dr. S. Kannan briefly described the activities of IANCAS and the contributions of BARC to radioisotope program in India. Later, he delivered a keynote covering the programs of Department of Atomic Energy, emphasizing the radioisotope program for healthcare and food security. Dr. Madhava B Mallia briefly explained the structure of the Workshop.

The technical program of the Workshop (enclosed) comprised of 11 lectures and 4 experiments. The lectures were held during the forenoon sessions and the afternoon sessions were dedicated for the experiments. 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.

The valedictory function of the workshop was attended by Dr. P.K. Mohapatra, Associate Director, Radiochemistry and Isotope Group, BARC. Dr Mohapatra

addressed the gathering and explained the opportunities available in Department of Atomic Energy in general and BARC in particular. On behalf of IANCAS, a set of two nuclear detectors, NaI(Tl) detector and G.M. Counter, were donated to the host institute for their academic use. The Workshop was concluded with a vote of thanks by Dr. Rhine Kumar. The workshop was well covered by local media, covering the prominent places in the local News Papers.

Glimpses of the Workshop

107th BRNS-IANCAS National Workshop
on
"Radiochemistry and Application of Radioisotopes"
at Department of Physics, Cochin University of Science and Technology, Cochin, Kerala
January 22-27, 2024

President, IANCAS	**Dr. P.K. Pujari** *Ex-Director, RC&I Group, BARC, Mumbai*		
Vice President, IANCAS & Chairman Workshop	**Dr. S. Kannan** *Ex-Director, RC&I Group BARC, Mumbai* **Prof. G.A. Rama Rao** *GITAM University, Hyderabad*		
Workshop Coordinators	Madhava B Mallia, SO/G, RPhD, BARC	mallia@barc.gov.in; madhavmb@gmail.com	09324088816
Convener and workshop director	Dr. Rhine Kumar A.K. Dept. of Physics CUSAT, Kochi	rhinekumar@cusat.ac.in	9447982019

Resource Persons

Name	**Designation & Affiliation**
Dr. Madhava B Mallia	SO/G, RPhD, BARC
Dr. Sudarshan Kathi	SO/H, RCD, BARC
Dr. Ashok Kumar	SO/F, HPD, BARC
Viju Chirayil	SO/F, RPhD, BARC
Ghanshyam Meena	TO/D, RCD, BARC

IANCAS Correspondence:
Secretary, IANCAS, C/o Radiochemistry Division, BARC, Trombay, Mumbai – 400085
Email: secretaryiancas@gmail.com / secretary@iancas.org; Ph: 022-25594590

Technical Programme		
Date / Time	**Lecture Topics**	**Resource Person**
22.01.2024; Monday – Day 1		
10:00	**Inauguration**	
11:00	**Keynote Address** – (Three stage nuclear program)	
11:30	**L1**: Nuclear Stability and Nuclear Structure	Dr Sudarshan Kathi, Radiochemistry Division, BARC
13:00	Lunch	
14:00	**L2**: Radioactivity and nuclear decay	Shri Viju Chirayil, Radiopharmaceuticals Division, BARC
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. Ghanshyam Meena, Radiochemistry Division, BARC Dr. Ashok Kumar, Health Physics Division, BARC
23.01.2024; Tuesday – Day 2		
10:00	**L3**: Interaction of Radiation with Matter	Dr. Ashok Kumar, Health Physics Division, BARC
11:15	**L4**: Radiation Detection and Measurement	Dr Sudarshan Kathi, Radiochemistry Division, BARC
12:30	Quiz	
13:00	Lunch	
14:00	Experiments & Discussions	
24.01.2024; Wednesday – Day 3		
10:00	**L5**: Fission and Fusion reactors: Advances and challenges	Dr Smt Usha Pal, Reactor Physics Design Division, BARC
11:15	**L6**: Types of accelerators and their applications	Dr. SISTA V L S RAO, Ion Accelerator Development Division, BARC
12:30	Quiz	
13:00	Lunch	
14:30	Experiments & Discussion	
25.01.2024; Thursday – Day 4		
10:00	**L7**: Radioisotope Applications in Health Care	Dr. Madhava B Mallia, Radiopharmaceuticals Division, BARC
11:15	**L8**: Health Physics and Radiological Safety	Dr. Ashok Kumar, Health Physics Division, BARC
12:30	Quiz	
13:00	Lunch	
14:00	Experiments & Discussion	
26.01.2024; Friday – Day 5		
10:00	**L9**: Application of Nuclear Technology for Food and Nutritional Security	Dr Shashidhar, Food Technology Division, BARC
11:15	**L10**: Positron Annihilation Spectroscopy and its application in material characterization	Dr Sudarshan Kathi, Radiochemistry Division, BARC
12:00	Quiz	
13:00	Lunch	
14:00	Experiments & Discussion	
27.01.2024; Saturday – Day 6		
10:00	Valedictory Function & Distribution of Certificates	

Experiments		
S.N.	**Topic**	**Resource Person**
E1	GM Counter – A Gas Filled Detector : Plateau and Statistics	Dr. Sudarshan Kathi
E2	GM Counter – Determination of dead time	Shri. Viju Chirayil
E3	Gamma-ray Spectrometry using NaI(Tl) Detector and Shielding Experiment	Shri Ghanshyam Meena
E4	Detection and estimation of radon in air	Dr. Ashok Kumar

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