

# Report on Educational visit to NCCCM (BARC) on 28<sup>th</sup> March 2022

MSc Final INORGANIC CHEMISTRY students are taken for an educational tour to BARC associated institute named National Center for Compositional Characterization of Materials (NCCCM). A group of 11 students and 6 faculty members attended the tour. Tour started with the introduction and briefing of senior scientists of the center. They gave brief idea about the available divisions and the type of work performed in those divisions respectively.

Group of 17 members are divided into 3 groups to start the process of visiting to different divisions simultaneously. NCCCM comprises of 4 divisions namely:

1. Ultra trace Analysis Laboratory
  2. Nano-Biotechnology lab
  3. Surface analysis Division
  4. Bulk analysis Division
- Ultra trace analysis lab concentrate on identifying the trace elemental analysis of a composite for their purification for the sensitivity of 8N: N stands for digit 9. Such great level of purity is a required protocol for the area of semi-conductors and environmental pollutant analysis. The analysis is performed by several types of spectroscopies like ICP-MS, ICP-AAS and IC-ICP-MS etc.
  - Nano-biotechnology division targets in the synthesis and biological applications of several metal nano particles.
  - Surface analysis division majorly works on the non-destructive analysis of materials with X-Ray/ $\gamma$ -ray spectroscopy; scanning electron microscope (SEM); powder X-ray diffraction techniques. Here scientists discussed about the production and usage of X-Ray/ $\gamma$ -rays for the characterization of several materials of the type thin films, composite materials of nano particles and super conductors etc. SEM and powdered X-ray diffraction derives the information about the thickness and characterization of powdered materials. Here in this section coating of materials also carried out.
  - The final visit to bulk analysis division characterizes the materials of solid nature. This division starts the analysis from the preparation of samples by Microwave chamber to the complete analysis for their composition using several instruments of the types:
    - ✓ Microwave sample preparation
    - ✓ Ion exchange chromatography
    - ✓ GC-MS
    - ✓ LC-MS
    - ✓ Flame absorption and Emission spectroscopy
    - ✓ C and S analyzer

Overall the visit to NCCCM provided the students an opportunity to observe and gain knowledge about several instruments and their use in areas of semiconductors and ore analysis

etc. At the end director of NCCCM **Dr. Sanjiv Kumar** interacted with us by briefly summarizing the visit and advised the students to orient their focus in attaining the goal and to be successful in the life. He asked us to plan for a Memorandum of Understanding (MoU) with the institute and make use of the facilities available.

