NIUS Chemistry Camp - HBCSE, TIFR

Batch XVIII.2 (June 7-14, 2023)

As a part of National Initiative on Undergraduate Science (NIUS) programme, members of chemistry group at HBCSE conducted instrumentation camp in chemistry XVIII.2 from June 7-14, 2023 in collaboration with TIFR Colaba, which was a follow up camp of exposure camp XVIII.1 held in December 2022. Around 54 students got chance to explore basic as well as advanced instrumental techniques used for investigation of different chemical systems and analysis of materials of interest.

Various experimental sessions were conducted at HBCSE by chemistry group members along with two external resource persons of Mumbai and Pune University form June 07 to June 09. Students were distributed into three groups which further subdivided to work in pairs on mini-projects. All experiments were designed in pre-lab, lab and post-lab approach to enhance students learning. Pre-lab activity helped students in recollection of theoretical concepts, awareness about safety, technical skills associated with the experiments and cognitive preparation for the experiment. Post-lab discussions assisted in realization of constraints of the system under study, limitations and modelling of an experiment and drawing inferences. Additionally, students were made to write Reflective Commentary on the experimental findings supported by discussions within the group as well as with other groups. The arguments and defences that came out during these discussions deepen the understanding of students towards concepts.

The experimental mini-projects conducted were as follows: 1) Revisiting Werner's experiments to understand coordination compounds with the help of synthesis of Cobalt complex and its analysis by conductivity and precipitation reaction 2) Synthesis of Azo dye 3) Spectrophotometric method to explore estimation of Ca (II) using Na_2EDTA.

From June 10 to 12, students explored different chemistry labs at TIFR with the help of members at TIFR, that included (i) Demonstrations as well as presentations on making electrode, water splitting, solar cells were shown to students, (ii) Working of Mass Spectrophotometer, High Performance Liquid Chromatography was explained to students, (iii) Low temperature facilities as well as basic lab techniques for drug development using Schlenk lines to see cancer cell lines were demonstrated to students, (iv) Synthesis of BODIPY based dye and its characterization with ESI-MS along with fluorescence study was one of the fascinating demo at TIFR, (v) Graduate students at TIFR discussed their work as well as possible ways to join TIFR with students.

Comprehensive idea of exploring fundamental aspects of chemistry was achieved during the visit. On June 13, students started designing of an experiment and continued the discussions on June 14. Designing of an experiment helped students in understanding nuances of steps involved in the experimental procedure, factors to be considered for planning of an experiment, constrains of the materials available and variables involved in the given experiment.

The main aim of NIUS camp is to expose and excite undergraduate students towards the diverse areas in chemistry. The interactions of students with the facilitators and researchers from HBCSE and TIFR motivated and inspired the students to pursue science and build a career in the respective fields.