

Exploring the world of Sciences with Experiments

R. E. Society's Gogate Jogalekar College, Ratnagiri

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As a part of National Initiative on Undergraduate Science (NIUS) programme, members of Chemistry group at HBCSE conducted a 3-day workshop for undergraduate students at Gogate Jogalekar College, Ratnagiri. The workshop was part of one-week certificate course on Fundamental of Basic Sciences under DBT Star College scheme.

The workshop was attended by 48 students of SY B.Sc. The first two days of the workshop involved two lab experiments which were performed by students in pairs. The experiments were chosen from laboratory manuals of B.Sc. syllabus and IChO problems. These were modified to enhance the learning of students by developing pre-lab and post-lab questions. Each day, the experiments were divided into pre-lab, performing the experiments and post-lab sessions. Pre-lab and post lab sessions involved in-depth discussions. The primary aim of pre and post lab sessions is to create opportunities for discussion on the concepts, procedural understanding and observations related to experiment. The students were divided into two groups of 24 each. They were given to perform two different experiments each day and the students were given the other experiment on day 2.

Experiment 1: Determination of carbonate (CO_3^{2-}) and hydrogen phosphate (HPO_4^{2-}) in an abrasive sample in which the supplied sample consisted of two substances as the main constituents - Na_2CO_3 and Na_2HPO_4 . The students had to determine the carbonate and hydrogen phosphate content in the given sample by acid-base titrations.

Experiment 2: Synthesis of m-dinitrobenzene and analysis by TLC This experiment involved synthesis of m-dinitrobenzene by nitration of nitrobenzene. The synthesized products were filtered and a discussion on purity and yield of product was conducted using the TLC plates developed by students.

The third day of the workshop had two components which were conducted in the two halves of the day with each group of students.

- i. **Design of experiment:** This module was adapted from 2012 US National Chemistry Olympiad. The session involved discussions about the variable parameters in an experiment and how to plan an experiment with a given set of chemicals and materials. The discussions were followed by a demonstration which helped in understanding the expected observations.
- ii. **Identification of given unknown salt solutions:** In this experiment salt solutions were provided and the students were expected to identify the salt by doing mutual reactions among the given solutions only.

The workshop concluded with exchange of learnings by the students and written feedback by them on the sessions conducted.

