

Chemistry Olympiad & NIUS Chemistry

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On behalf of
All members of the Chemistry Cell

Chemistry Olympiad: Experimental problems

Sensitize students towards safety aspects and good practices in the Chemistry laboratory

Test students on wet laboratory skills related to three core areas: synthesis, analysis and kinetics

Have innovative designs, contain comprehension questions related to the procedure

Demand rigorous standardisation w.r.t. reaction parameters

Chemistry Olympiad: Theoretical problems

Designed with a context and thus have pedagogical value

Test students on inter-linked concepts for a given topic
(comprehensive assessment)

Interdisciplinary and thus present a vibrant picture of
Chemistry

Content learning through problem solving

NIUS Chemistry

Features

Doable by undergraduate students

Need moderate facilities and thus could be developed at HBCSE

Interdisciplinary

Most projects are conducted at HBCSE laboratories:
Emphasis on peer interactions and co-operative learning

Everyone in the Chemistry Laboratory has a role to play

Structure

The cycle starts every December with an exposure camp: attended by 40-50 first year (B.Sc./ integrated M.Sc.) students across India.

15-20 students are selected for projects

Projects continue in summer and winter vacations

Mentors/ Resource persons (from research institutions, local colleges, chemical industries and HBCSE)

Project Areas

Study of physico–chemical properties of surfactant containing systems (phase diagrams, equilibria of azo dye/ acid-base indicators, cmc* measurements, and extraction of heavy and alkali metal ions.)

(Interfacial chemistry, experimental)

Synthesis of organic compounds using catalysts, different energy sources, solvent free reactions, deep eutectic solvents, Multi-component reaction Chemistry.

(Organic chemistry, experimental)

Investigation of formation of noble gas compounds having conventional bonding systems, catalysis using nano-sized noble metals like gold, silver, studies of hydrated electrons in water, hydrated clusters of haloacids, designing of models to study the anomalous behaviour of water.

(Computational/ Quantum chemistry, theoretical)

*critical micelle concentration

Evolution

Has started reaching its full potential from 2009

313 students have attended the first camp

Projects: 54 completed, 33 ongoing

Extension

Laboratory courses for UM-DAE* Centre for Basic Sciences (CBS) conducted at HBCSE for first two years (2008-2010)

International Conference on Education In Chemistry (ICEC) initiated in 2010 (upcoming in 2014)

*UM-DAE: University of Mumbai- Department of Atomic Energy

Things to work on

Development of Pedagogical Materials

Theory (core areas of Physical Chemistry)

Addressing Conceptual Pitfalls, problem solving
(work initiated in 2013- chemical thermodynamics)

Experiment

Developing novel experiments for regular UG labs

Training camps in experimental Chemistry

Introduction of Chemistry Education related projects for
selected students