

## ADVAIT HASABNIS

Fourth Year, Integrated MSc in Chemistry, IIT Bombay, India

DOB: 21<sup>st</sup> June 1991

Level of Education	Degree / Branch	Name of University	Percentage / Grade
Graduation (2009 – 2014)	Integrated MSc Chemistry	Indian Institute of Technology, Bombay	8.86 out of 10
Intermediate (+2) (2006 – 2008)	International Baccalaureate (IB)	International School of Stuttgart, Germany	89 %

### ACADEMIC ACHIEVEMENTS

- Awarded **institute academic prizes** for three consecutive years for **ranking 1<sup>st</sup>** in the Department of Chemistry (5 Yr. Integrated MSc Programme) in IIT Bombay.
- Currently availing a **scholarship from the Government of India** under the Department of Science and Technology-Inspire Programme.
- Selected for the Vijyoshi Science Camp 2009 organised by IISc and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), where world science leaders were present to promote research and science as a career.

### ACADEMIC PROJECTS

#### Design & Validation of Software for SPR Instrument: Research Project (May – July 2012)

- **Guide: Prof. Masson, Department of Chemistry, University of Montreal, CANADA**
- Designed and validated software from scratch to analyse data from a home-build surface plasmon instrument.
- Learnt **LabVIEW**, completed the software and performed calibration and biosensing experiments.

#### Carbon Nanotubes: Research Project (September 2011 – Current)

- **Guide: Prof. Contractor, Department of Chemistry, IIT Bombay, India**
- Investigating dispersion of agglomerated MWCNTs using various surfactants (Triton X 100, CTAB, SDS)
- Used surfactants to disperse MWCNTs in solution
- Currently working on the previously undiscovered behaviour shown by MWCNTs by analysing AFM images.

#### Organic Synthesis Training: Research Project (May 2011)

- **Guide: Prof. Kaliappan, Department of Chemistry, IIT Bombay, India**
- Training in basic organic synthesis methods of natural products
- Learnt column chromatography, preparation of various starting materials, IR spectrometry

#### Silver Nanoparticles: Course Project (October 2010)

- **Guide: Prof. Contractor, Department of Chemistry, IIT Bombay, India**
- Prepared silver nanoparticles and studied the difference in properties of nanoparticles from macroparticles.

#### C++ Mini National UID Project: Course Project

- **Guide: Prof. Deepak Phatak, Computer Science & Engineering, IIT Bombay, India**
- Developed fingerprint recognition and matching programme on the lines of the Unique ID project launched by Government of India.
- Was the leader of the group whose main focus was to devise a method to compare fingerprints and determine whether a given pair of fingerprints matched or not and if yes then to what degree.

## LABORATORY EXPERIENCE

- **Organic Chemistry Lab I & II**  
Purification of solids and liquids, separation of enantiomers, substitution reactions, redox, reactions, qualitative analysis of organic compounds, separation of binary mixtures
- **Separation Techniques Lab (Organic & Inorganic)**  
Column chromatography, paper chromatography, extraction techniques, ion exchange chromatography
- **Principles of Chemical Analysis (Inorganic Chemistry Lab 1)**  
Oxidation-reduction titrations, gravimetric analysis, qualitative analysis
- **Inorganic Chemistry Lab II**  
Complex material analysis, conductometry, spectrophotometry, estimation of mixture of metal ions by EDTA titrations, Karl-Fischer titration
- **Physical Chemistry Lab I & II**  
Potentiometry, UV-Vis spectrophotometry, enzyme kinetics, Use of pycnometer, eudiometer, isentensiscopes and manometer
- **Chemistry Lab**  
Electrochemical cells, polarimeter, colorimeter, thin layer chromatography

## CHEMISTRY COURSES UNDERTAKEN

- **Methods in Organic Synthesis**  
Metathesis, Organometallics as protecting groups, coupling reactions
- **Organic Chemistry I, II & III**  
Hydrocarbons, stereochemistry, theoretical and mechanistic concepts, chemistry of carbonyl compounds, organometallic reagents, stereoselective reactions, retrosynthetic analysis, functional group interconversion, oxidation & reduction, selectivity, protecting groups, cycloaddition reactions, molecular rearrangements
- **Modern Methods of Analysis**  
Spectrophotometry, flame emission spectroscopy, nephelometry, turbidimetry, Raman spectroscopy, electro analytical methods, thermogravimetry, gas chromatography
- **Introduction to Cell & Molecular Biology**  
DNA, protein structure, separation techniques, haemoglobin, enzymes, carbohydrates, signal-transduction pathways, metabolism, TCA cycle, photosynthesis, gene expression
- **Introduction to Nanotechnology**  
Solid state-physics, TEM, SEM, STM, AFM, nanocrystals, theoretical modelling, self assembly, fabrication and applications
- **Chemistry I & II**  
Transition metal chemistry, periodic table, Schrodinger equation, hydrogen atom, MO theory, stereochemistry, carbonyl group, coordination complexes, thermodynamics, organic chemistry
- **Chemistry of Main Group Elements**  
Non-transition elements, stereochemistry, organometallics, inorganic rings, chains and cages
- **Physical Chemistry I**  
Real gases, intermolecular forces, liquid state, thermodynamics of solutions, phase rule
- **Inorganic Chemistry I**  
Transition elements, complex compounds, crystal field theory, spectral and magnetic properties, metal-ligand bonding and stereochemistry, applications
- **Rate Processes**  
Rates of chemical reactions, rate expressions, catalysis, non-linear dynamics
- **Chemical & Statistical Thermodynamics**  
Thermodynamic functions, phase & chemical equilibria, distributions, non-equilibrium thermodynamics, Onsager's reciprocity relations