

St. Xavier's College

Mapusa - Goa

Awarded the status of "College with Potential of Excellence" by UGC [2004]

Accredited by NAAC with Grade 'A' [2019]

Awarded the DBT Star College Scheme by
Department of Biotechnology, Government of India [2021]

Department of Chemistry

C T A L Y S T

"Be a catalyst and enrich your life and those around you."



VOLUME: XIII

2023 – 2024



Our Vision

To use the knowledge of Chemistry for the benefit of society and the conservation of the environment.



Our Mission

To ignite the spirit of inquiry, creativity, independent thinking & responsibility in our students and teachers.



- To impart knowledge, foster understanding and enhance the application of Chemistry Education to students.
- To develop / enhance laboratory skills in students.
- To enhance the moral development of students and help them to be disciplined world citizens.

Novena Prayer in Honor of
ST. FRANCIS XAVIER

Feast Day: December 3



O Great St. Francis, well beloved and full of charity, with thee I reverently adore the Divine Majesty; and since I specially rejoice in the singular gifts of grace bestowed on thee in life, and of glory after death, I give thanks to God, and beg of thee, with all the affection of my heart, that by thy powerful intercession thou mayest obtain for me, above all things, the grace to live a holy life and die a holy death. Moreover, I beg of thee to obtain for me (request your favor); but if what I ask does not tend to the glory of God and the greater good of my soul, do thou, I beseech thee, obtain for me what will more certainly attain these ends. Amen.

Chief Editor

Ms. Kathleen Pinto

Editorial Team

Dr. Johnross Albuquerque

Ms. Milagrina D'Souza

Teaching Faculty Members

Ms. Kathleen Pinto [HoD], Ms. Janesline Fernandes, Ms. Edwina Pereira, Ms. Isabel de Noronha, Mr. Mahesh Nair, Ms. Sheryl D'Cruz, Ms. Shivta T. Mhamal, Ms. Flavia S. Travasso, Dr. Andrew D'Souza, Dr. Mira Parmekar, Dr. Johnross Albuquerque, Dr. Rheane da Silva, Ms. Milagrina D'Souza, Mr. Clarence Rodrigues, Ms. Shraddha Piligaonkar and Ms. Niti Naik.

Laboratory Staff

Mr. Cajetan Silveira, Mr. Douglas D'Souza, Ms. Susmita Parab, Mr. Savio Coutinho, Mr. Narendra Parsekar, Mr. Suresh Parsekar, Mr. Vishnu Singh, Ms. Kunda Raut and Mr. Aniket Mandrekar.

Administrator's Message



Through these few words I would like to convey to the HoD, staff and students of the Department of Chemistry my hearty congratulations on bringing out yet another issue of their newsletter 'Catalyst'. The newsletter will give to all the readers a good grasp of the work that is going on in this department.

Chemistry is an interesting subject. It very much related to our daily life. It is present in the food that we eat and how it breaks down to provide us with the necessary energy, in the air that we breathe and even in the reactions taking place within our bodies, and which help us to live healthy lives. The basic concepts of science that we have studied in our schools, have much to teach us. But at the college level this knowledge assumes a higher level, and helps the students to understand various aspects that cover varied fields like ecology, botany, pharmacology, forensic studies, etc. It is a science that studies the matter, its structure, composition and the changes that occur within this matter due to exposure.

This itself opens diverse opportunities to the students, like employment, or going for further studies leading to research. In our college we have M Sc in Physical Chemistry. We are also trying to see whether we can get another branch started so that the students have a wider choice.

Once again congratulations to the Department of Chemistry, may the work bear abundant fruit for all.

God bless you all.

**Fr. Tony Salema
Administrator**



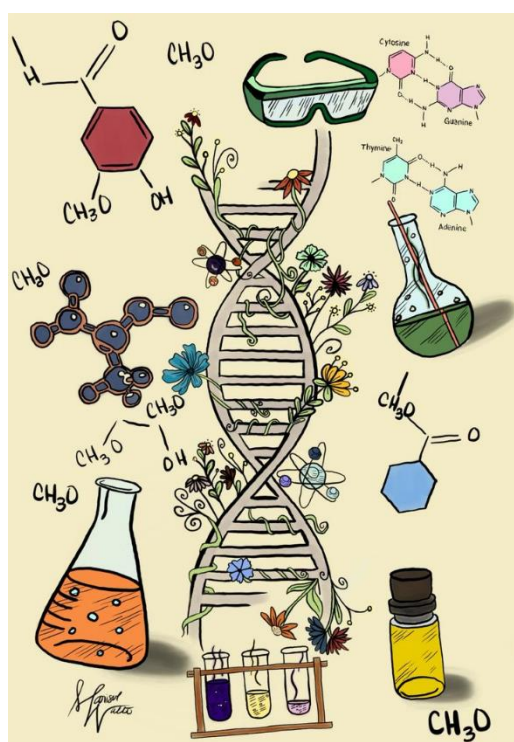
Principal's Message

I am happy to know that the Department of Chemistry is releasing their Newsletter "Catalyst". The Department is working wholeheartedly in organizing various activities, providing enriching learning experiences to students thus making learning interesting. It is a matter of pride that the Department was sanctioned and conducted activities sponsored by Goa State Research Foundation, Govt. of Goa.



I congratulate the Editor, Dr. Johnross Albuquerque and the Head of Dept., Ms. Kathleen Pinto and the entire team of staff members and wish them all the best in imparting Chemistry education to our students.

**Ms. Ursula Barreto
Acting Principal**



Message from Head of Department



The Department of Chemistry for the last 61 years has contributed to the state of Goa through the spread of Chemistry education and has been shaping students contributing in various domains of the society. The Department has always been on a high growth path and has experienced and dedicated faculty with strong commitment to Chemistry education, who work with zeal and enthusiasm to provide a vibrant learning environment.

In keeping with the department's vision, the holistic development of the students is focused upon that which instills a habit of continued learning and a sense of responsibility in them, to contribute towards the betterment of the society.

The students are motivated to participate in various competitions and they have brought laurels to the department. This year has seen 2 Projects sanctioned by Directorate of Higher Education [DHE] and Goa State Research Foundation [GSRF] which is a matter of pride for the department.

This year has also seen a whole lot of activities conducted by the dedicated Faculty. We have imparted training for answering GUART exams which has resulted in many of our students pursuing higher education. We have conducted a State level Seminar on "Handling of sophisticated Instruments" for the benefit of students and teachers across Goa. Many sessions were conducted on various topics for the knowledge enhancement of students. The Internship Program for students has helped them to be exposed to the work of world adding to their learning experiences. The "Summer School" program opened the doors of the department of Chemistry to budding std XI students making chemistry enjoyable. Two of our Teachers were felicitated by the Archdiocesan Society of Education for 30 years of meritorious services

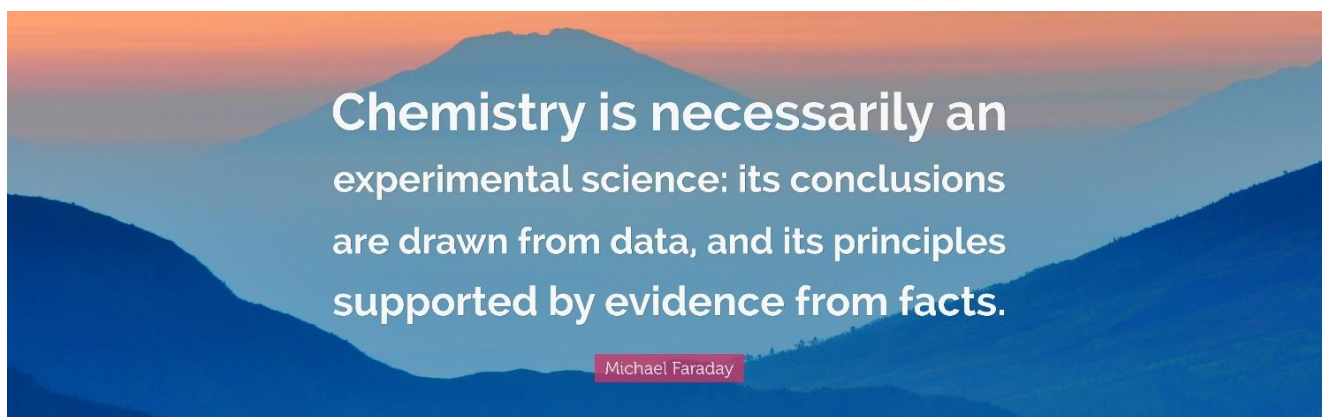
to the Institution. An outstation educational Tour was also organized for our T.Y.B.Sc students to Kerala, which was a great learning experience.

It is indeed my great pleasure that our department is publishing this newsletter etching every aspect of activities and events held in academic session 2023-24. The newsletter aims to bring into focus various proceedings, functions and happenings in the department.

I am thankful to God who is our constant source of enlightenment and strength. I am grateful to the Management, Administrator, Principal and Vice-Principals for their wholehearted support in the conduct of various activities and for their guidance. I am grateful to each Faculty member for their commitment and dedication in their academic work as well as curricular activities. My special thanks goes to our Editor, Dr. Johnross Albuquerque for his commitment in bringing out this Newsletter.

Happy reading!

Ms. Kathleen Pinto
Head, Department of Chemistry



CELEBRATION OF LIFE



Prof. P. M. Usgaokar

Department of Chemistry
June 1966 – 1968 St. Xavier's College, Bastora
1968 – 1998 St. Xavier's College, Mapusa

The Department of Chemistry organized a memorial service for Prof. P. M. Usgaokar at 12:00 p.m. on 21st October 2023. Various teachers from other departments along with the administrator of the college, Rev. Fr. Antonio Salema attended the service.



Ms. Edwina Pereira, In-charge of Chemistry Department led the service, praying for the departed soul of Prof. Usgaokar and for this family members. There was sharing of memories by faculty members who worked with Prof. Usgaokar and reading of messages sent by those who could not be present for the service. Towards the end, Fr. Antonio Salema addressed the gathering and the service ended.





Celebrating **30**
years



in the teaching profession



Our teachers: **Ms. Kathleen Pinto** and **Ms. Isabel de Noronha** were felicitated by the Archdiocesan Board of Education, for 30 years of meritorious services in the field of education, on 8th February 2024 at Ravindra Bhavan, Margao. It was a well-organized felicitation program with the theme "Be Imitators of Jesus the Great Educator".

We wish them well in the years to come.





Até a próxima
Ms. Isabel de Noronha



Dear Ms. Isabel de Noronha

**We express our gratitude to you for
being an incredible friend and a
colleague to us...**

**We are thankful for all the good times
and sweet memories we shared with
you...**

**Thank you for inspiring all with your
simplicity and for being an integral
part of the college.**

**HAPPY FAREWELL and ALL THE BEST
in new life beginnings.**



PARADIGM SHIFTS FOR GREATER EFFECTIVENESS IN THE REALM OF EDUCATION

“I have an obligation to all peoples, to the civilized and the simple, to the educated and to the ignorant” (Romans 1:14)

Throughout human history, many changes have come about through a new vision, a fresh approach to what existed earlier, created by evolving a new lens – A paradigm shift!

UNIVERSITY EDUCATION COMMISSION, 1948 (POPULARLY KNOWN AS THE RADHAKRISHNAN COMMISSION) was a major landmark for enunciating the goals and objectives of higher education in Independent India. It is the opinion of the commission that if our cultural life is to retain its dynamism, it must give up idolatry of the past and strive to realise new dreams.

We have achieved much through the subsequent policies implemented in India, **FIRST EDUCATION POLICY IN 1968**, followed by the **NATIONAL POLICY ON EDUCATION, NPE-1986** and its Programme of Action (PoA) 1992.

THE NATIONAL EDUCATION POLICY (NEP 2020) was implemented on July 29,2020. It begins with Goal 4 of the **United Nations, 2030: transforming our world**.

NEP 2020, provides a fresh canvas to paint on and opens up new avenues. Although, the policy has been scrutinized and dissected by experts in the field of Education and Industry and have witnessed conflicting views, networking systems will have to be established with all sectors- Educational Institutes, Industry, R & D organizations. Together, we can contribute in aligning it, in the direction of sustainable development.

“Building a New India, where every child is educated, where the marginalized are empowered, where the educational system seeks to transform society, is our dream. (CBCI 2006, 10)

Let us begin by creating an ecosystem of motivated faculty and students.

UNDERSTANDING OBE

“Education is an admirable thing, but it is well to remember from time to time that nothing that is worth learning can be taught.” (Oscar Wilde)

“Every place of formal education and every place of non-formal education can become a centre of a greater network which, from the smallest village to the most complex metropolis, wraps the world in HOPE”. There are many different ways of learning: Teaching is one of them!

We learn a great deal on our own, non-formal education. Hence the objective of education should be learning not teaching. When teaching becomes synonymous with the motivation to learn, we begin to get somewhere.

UNDERSTANDING OUR STUDENTS

Understanding where students are on the spectrum of novice to expert learning in your discipline or course is a key challenge to implementing effective and inclusive pedagogy (National Research Council 2000).

Ensuring academic excellence for all students is a fundamental goal of all educational Institutions. However, this goal presents a unique challenge: providing effective support to both under-performing and high-achieving students simultaneously.

Academic preparation is typically a function of one's high school experience, whether the high school was well resourced or underfunded. Whether or not a student receives a quality high school education is usually a structural matter reflecting inequities in our educational systems, not a reflection of an individual student's ability to learn.

Students will learn well in the ways that the instructor learned well. Actually, most instructors in higher education are self-selected into disciplines that align with their interests, skills. Our students have broader and different goals for seeking a college education and bring a range of skills to their coursework, which may or may not align with instructors' expectations of how students learn.

'Quality Education' is not a system glued to individualism, ambition, competition, mere academic results. In the true sense, 'Quality Education' produces persons with thought and feeling, persons who are capable of looking at the nobler things in life. It refers to all-round development of the person, humanism, authentic values-character formation, healthy relationships, dignified self-presentation and thoroughness about everything one does.

There are moments in history when a new direction has to be given to an age-old process. **"That moment is today"**.

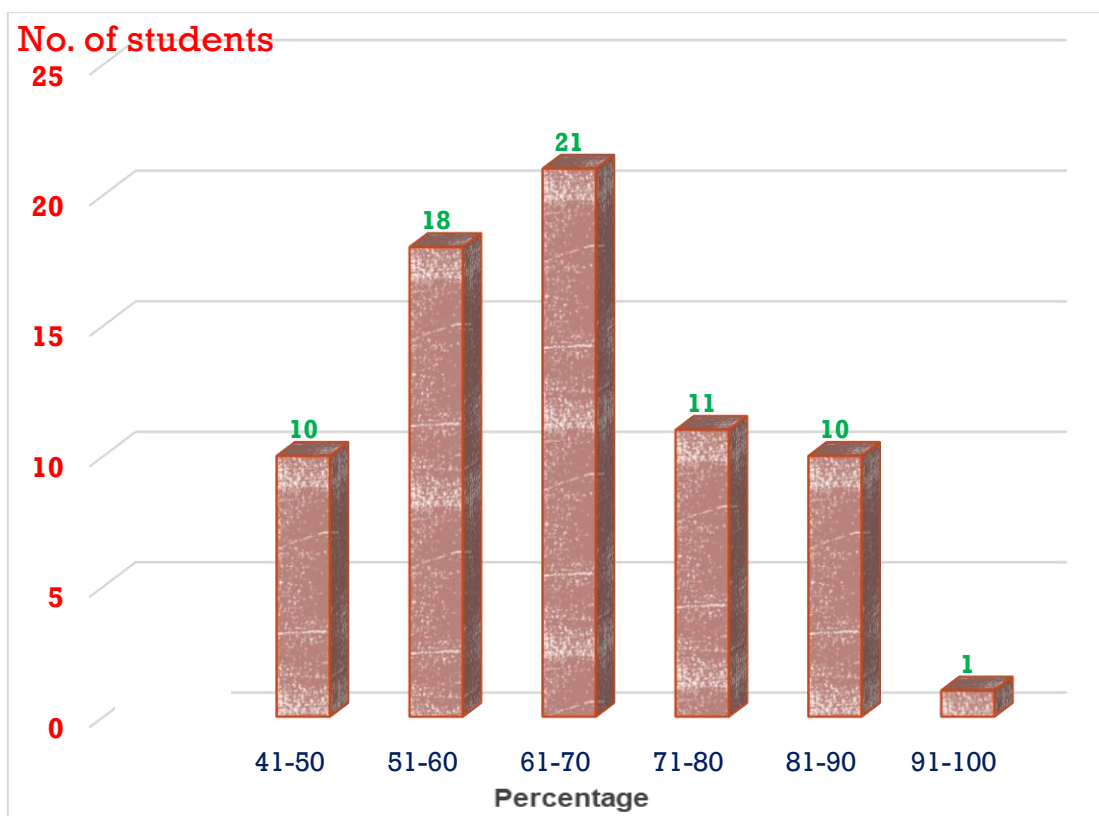
Ms. Edwina R. Pereira
Department of Chemistry

T.Y.B.Sc. Chemistry Results

2023 – 2024

First 10 Overall Toppers

Rank	Name of student	Marks out of 1300	Percentage
1 st	Ms. SANIYA SANDESH KOVTANKAR	1202	92.46
2 nd	Ms. PRADNYA TANAJI GORAL	1158	89.07
3 rd	Mr. SWARAJYA SUBHASH PATIL	1155	88.84
4 th	Ms. SWEZEL MENDES	1151	88.53
5 th	Ms. CYZEL DANIKA D'SOUZA	1146	88.15
6 th	Ms. PRACHITI PRALHAD DESAI	1131	87.00
7 th	Ms. SALONI SHANKAR MANDREKAR	1120	86.15
8 th	Ms. SANISHA JEWELA PEREIRA	1117	85.92
9 th	Ms. ASHWINI LAMANI	1088	83.69
10 th	Mr. SHRITEJ SHANKAR NAIK	1081	83.15

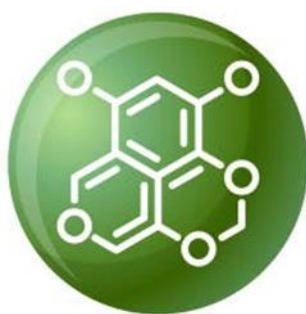




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Departmental Activities

2023 – 2024



Educational visit to Glenmark Pharmaceuticals



A total of 23 students comprising of T.Y.B.Sc. (Analytical Chemistry) and S.Y.B.Sc. students visited Glenmark Pharmaceuticals where they learnt about the site history, vision and other facilities of Glenmark Pharmaceuticals, concepts like Good Manufacturing Practices and important safety protocols before entering the manufacturing area. They were also shown the entire manufacturing process, from the raw material storage to the finished product packaging; and informed about the various career opportunities in the Pharmaceutical industry and how their academic background could be relevant to the field.



During the tour, the students had an interactive session with the Glenmark team, where they had the opportunity to ask questions and clarify their doubts. The students found the visit informative and enriching, and they appreciated the opportunity to witness the practical application of their theoretical analytical chemistry knowledge. The students were accompanied by Dr. Andrew D'Souza and Dr. Rheane Da Silva. The visit was coordinated by Dr Andrew D'Souza under the guidance of Ms. Edwina Pereira, Departmental in-charge.

Educational visit to Kaiga Nuclear Power Plant



The T.Y.B.Sc. students were taken to Kaiga Atomic Power station, near river Kali in Uttara Kannada district, Karnataka for interacting with actual industrial personal, to fill the bridge between technical concepts taught in curriculum and industry applied concepts; and finally, to prepare the students for the selection of career paths in various industries. The trip was an

exhilarating and irradiating experience where the students had a practical feel to the theoretical knowledge, reinforcing the fact that ' Nuclear Power is inevitable'



The visit was coordinated by faculty members Ms. Sheryl D'Cruz, Ms. Shivta T. Mhamal, and Ms. Flavia Travasso under the able guideship of the Departmental In-Charge, Ms. Edwina Periera. The other faculty members who accompanied the students were Dr. Johnross Albuquerque, Ms. Shradha Piligaonkar and Ms. Niti Naik.

Educational visit to Goa College of Agriculture



At Goa College of Agriculture, Ela Farm, Old Goa, the F.Y.B.Sc. SEC students attending the paper titled 'Soil and Water Analysis' were briefed on testing of soil and water: various testing parameters, sampling techniques with practical demonstrations.



The students were then moved to the testing laboratory where they analyzed the soil samples for NPK, micronutrients and were able to recommend proper fertilizer dosage. There was enthusiastic participation in these sessions wherein students understood the basics of agriculture.



Preparation for the Birth of Jesus Christ



Advent is a season observed in most Christian denominations as a time of expectant waiting and preparation for the celebration of the Nativity of Christ at Christmas. During each week of the Advent season, the teaching and non-teaching staff of the Chemistry Department got together for a small prayer service where the respective advent candles were lit following a short invocation which included a prayer and reading of short Biblical passage. This included a brief narration about of the significance of each Advent candle. On 22nd December 2023, the fourth candle was lit, followed by a get-together to commemorate the birthday of Jesus Christ. The Departmental in-charge, Ms. Edwina Pereira spoke on love, LOVE being born on Christmas Day, and all of us being called to serve each other with love. There were games and prizes for the teaching and non-teaching staff, with snacks and drinks followed by fellowship meal. The time was well spent as all enjoyed the celebration.

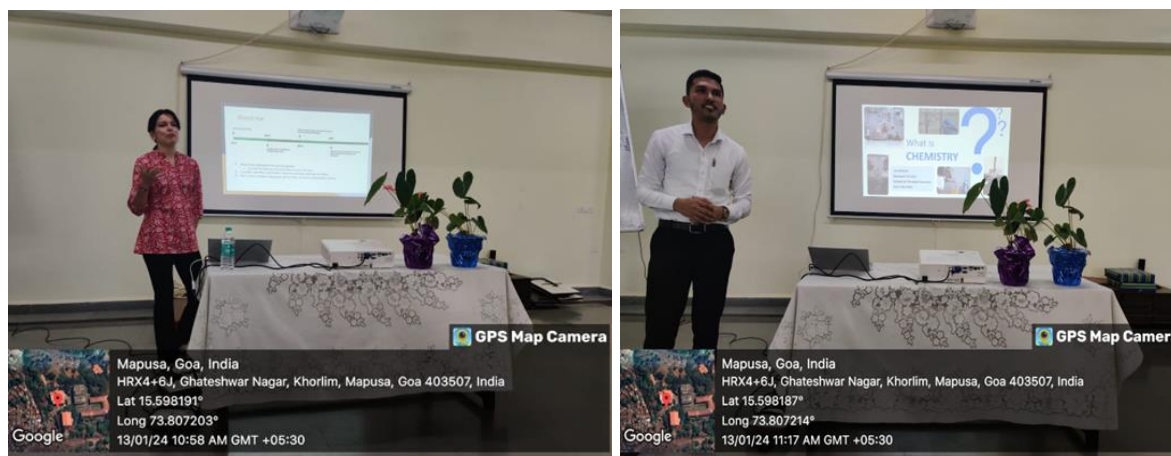




'Soft Core v/s Hard Core Chemistry in the light of Education Foresight'



An interactive talk was organized for the F.Y.B.Sc., S.Y.B.Sc. and T.Y.B.Sc. Chemistry Students on the topic 'Soft Core v/s Hard Core Chemistry in the light of Education Foresight' at the Conference Hall, Post Graduate Block of St. Xavier's College. The Resource Persons for the session were [1] Ms. Havana Kay Carmel Menezes, Research Scholar at Wageningen University & Research Centre, Netherlands and [2] Mr. Leo Francisco Blaise D'Souza, Research Scholar School of Chemical Sciences, Goa University.



Ms. Havana Kay Carmel Menezes gave a discourse on educational foresight about studying in Netherlands and abroad. She also shared a lot of her educational experiences, to mention a few: (1) about her master's program (at Wageningen University & Research Centre, Netherlands), (2) research thesis in Dubai where she did soil analysis for salinity levels under date palm trees and (3) as a member of a consultancy group project in Valencia where she analysed the irrigation efficiencies and soil water content in citrus orchards.

Mr. Leo Francisco Blaise D'Souza delivered an inspiring talk on Core Chemistry in everyday life. He began the historical tale on how alchemists endeavoured to

transform 'base metals' such as lead into 'noble metals' like gold, and to create elixirs to cure disease and extend life, which eventually led to modern chemistry: the isolation of drugs from natural sources, metallurgy, and the dye industry. He then highlighted how chemistry continues to deepen our understanding and improve our ability to harness and control the behaviour of matter. He also spoke about the chemistry that is associated with our everyday life such as how sunlight plays an important role in the conversion of cholesterol to vitamin D in the body as well as the role various chemical interactions play in saturated fats existing as a solid and unsaturated fats as a liquid. A glimpse into the opportunities in the future of chemistry was also presented, with an emphasis on sodium ion batteries developed in India by KPIT Technologies, Pvt. Ltd.

A total of 62 students from the Department of Chemistry attended the session. The Interactive session was co-ordinated by Ms. Kathleen Pinto, HoD Chemistry Department, Dr. Andrew D'Souza and Dr. Johnross Albuquerque.



GU-ART training for T.Y.B.Sc (Chemistry) students

The Department organized training sessions for GU-ART (Goa University Admission Ranking Test) for securing admissions to Post Graduate programmes offered at the Goa University and Affiliated Colleges. This event was funded by the Department of Biotechnology (DBT), Government of India under the DBT Star College Scheme. The convener for these training sessions was Ms. Kathleen Pinto, Head of Chemistry Department while the Coordinators and Co-coordinators were Ms. Milagrina D'Souza, Dr. Mira Parmekar and Ms. Flavia Travasso, Dr. Johnross Albuquerque respectively.



On the first day (27th January 2024), the training session began at 1:30 p.m. Ms. Milagrina D'Souza introduced the resource persons for the day: Mr. Sankalp N. Naik, Mr. Sajish D. Phadte and Ms. Ashweta U. Parsekar who were pursuing their studies at Goa University in the field of Organic Chemistry. The second day of the training was on 3rd February 2024 and the resource persons were Mr. Velicio Abranches,

Ms. Goutami R. Pilankar and Ms. Rachana R. Raul who were studying Organic Chemistry at Goa University.



On both days, the resource persons focussed on various concepts of inorganic, organic and physical chemistry belonging to UG semesters I to IV, followed by a discussion on the pattern of the paper and marking scheme. They also solved several MCQs. At the end of the sessions on respective days, Dr. Mira Parmekar presented a token of appreciation to all the resource persons, on behalf of the Chemistry Department.

‘Hands-on Training on Sophisticated Analytical Instruments’



The 3-Day State Level Workshop ‘Hands-on Training on Sophisticated Analytical Instruments: infrared spectroscopy, UV-Vis Spectroscopy, High-Performance Liquid Chromatography, Gas Chromatography, X-ray Diffraction Analysis and Cyclic Voltametry’ was held from 5th to 7th February 2024 at St. Xavier’s College Post Graduate Block. The workshop was funded by Directorate of Higher Education, Government of Goa. About 6 colleges across Goa registered for the event with a total of 54 participants comprising of faculty members, UG and PG students.



The chief guest for the Inaugural function (on 5th February 2024) was Mr. Rohit Gupta, General Manager, Human Resources and Admin, Glenmark Pharmaceuticals Limited. Mr. Rohit Gupta during his keynote address to the participants highlighted India’s need to grow at 8 – 9% for the next 20 years to become a developed nation by 2047. Mr.

Rohit Gupta also called attention of the students to developing good reading habits, punctuality and discipline which are some of the soft skills required for the corporate world.



The inaugural function was followed by the first technical session by Dr. Hari Kadam, Assistant Professor at School of Chemical Sciences (SCS), Goa University on '**High Performance Liquid Chromatography**' who comprehensively explained what HPLC is, how it works, and the different liquid chromatographic techniques used to purify mixtures.

The second session on **Gas Chromatography** was delivered by Dr. Prajesh Volvoikar, Assistant Professor at SCS, Goa University who meticulously explained what Gas chromatography is, its operational mechanism and different Gas chromatographic techniques. The Resource person for the explanatory talk and on **UV-Vis Spectroscopy** was Dr. Pradnyesh Satardekar Assistant Professor of Chemistry Ganpat Parsekar College of Education. Dr. Pradnyesh explained extensively what is UV-Vis spectroscopy, its procedural working and basic operation. The hands-on session on UV-Vis spectroscopy was conducted by Ms. Milagrina D'Souza, Assistant Professor from Dept. of Chemistry, St. Xavier's College.

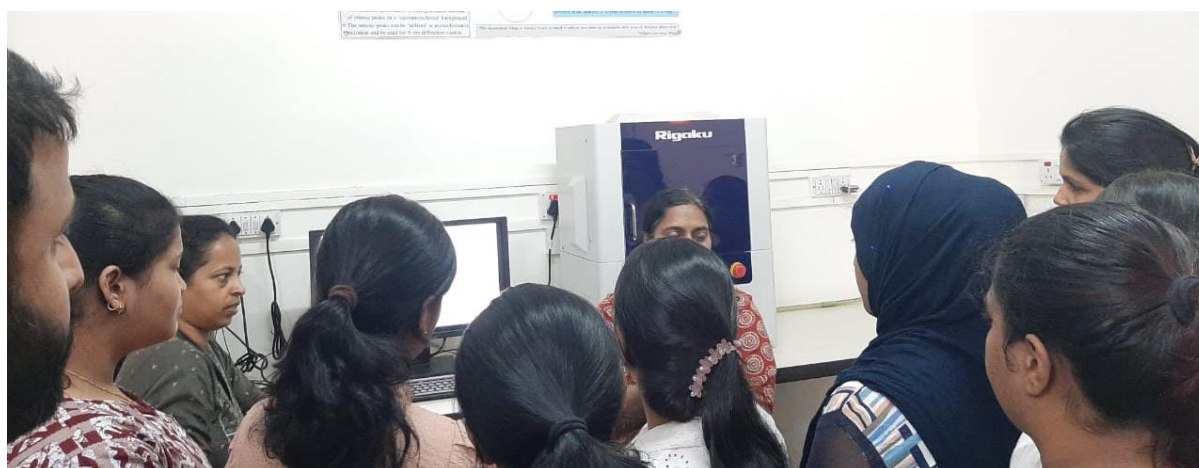


On the second day of the workshop, the first session was on **Infrared Spectroscopy** and the resource person was Dr. Madhavi Naik, Assistant Professor Carmel College

for Women, Nuvem, Goa. Dr. Madhavi explained thoroughly on the principle behind IR spectroscopy, how it works and the various applications of this technique. This was followed by hands-on session by Mr. Clarence Rodrigues, Assistant Professor from Dept. of Chemistry, St. Xavier's College on IR where students were shown the IR instrument and they prepared IR samples and recorded the respective spectra.



The second session was on **Cyclic Voltammetry** for which Dr. Anjani Nagvenkar Assistant Professor of Physical Chemistry, SCS, Goa University was the resource person. Dr. Anjani explained comprehensively what CV is, its functioning mechanics, imparting to the participants practical knowledge necessary to carry out robust cyclic voltammetry measurements in their independent research. The hands-on session was conducted by Ms. Shivta Mhamal, Assistant Professor, St. Xavier's College.



On the third day, the session on **X-Ray Diffraction Analysis** was given Dr. Reshma Raut Dessai, Assistant Professor of Physics, Goa University. Dr. Dessai painstakingly explained what XRD analysis is and how it functions. This was supplemented by the hands-on session.



Inter-departmental educational visit to BITS Pilani, Goa



About 32 students from the various Science departments of St. Xavier's College (Chemistry, Microbiology, Physics, Computer Science, Botany, Biotechnology, Electronics, Mathematics) were taken on an educational tour to BITS Pilani K. K. Birla Goa Campus, Sancoale, Goa to familiarize them with various aspects of interdisciplinary studies.





At the campus, the students were taken on a visit to various departments where they interacted with various faculty members and other resource personnel. During this interaction, there were made aware about various opportunities available to them for higher studies, and how newer approaches and better instrumental technologies

help in contributing towards advancement of science.

The trip was coordinated by Mr. Clarence Rodrigues, Assistant Professor in Chemistry and was funded by the Department of Biotechnology, Govt. of India. The students were accompanied by faculty members: Mr. Clarence Rodrigues and Ms. Shraddha Piligaonkar from the Chemistry Department.



8th Annual 'Festival of Innovation: Goa's Young Innovators'

The 8th Annual 'Festival of Innovation: Goa's Young Innovators', a State Level Workshop for School, Higher Secondary School and College students, funded by Department of Biotechnology, Govt. of India, was on 15th February 2024. This workshop witnessed the enthusiastic participation of 28 institutions from across Goa, bringing with them their innovative models, to share their technological ideas and scientific innovations.



The Chief Guest for the event was Mr. Vaibhav Chhabra, Co-Founder, Maker's Asylum, who also delivered the Keynote address on innovations. The judges for the

Goa's Young Innovators competition were Dr. Anjani Nagvenkar, Assistant Professor, SCS, Goa University; Ms. Samidha Narvekar & Mr. Leo D'Souza, Research Scholars, SCS, Goa University; Mr. Sheikh Abdul Aziz, Alumnus, St. Xavier's College, Mapusa and Mr. Keegan Pinto, Ex- General Manager Maintenance, Rajdeep Builders.

INAUGURAL FUNCTION



The event was coordinated by Ms. Flavia Travasso, Ms. Sheryl D'Cruz and Ms. Shivta Mhamal, Assistant Professors, under the guidance of Ms. Kathleen Pinto, Head, Department of Chemistry. The winners of the Goa's Young Innovators competition were:

School Category

- 1st Place: St. Joseph's High School, Arpora
- 2nd Place: The Rosary High School, Cujira, Bambolim
- 3rd Place: St. Thomas Boys' High School, Aldona

Higher Secondary School Category

- 1st Place: Purushottom Walawalkar Higher Secondary School, Khorlim
- 2nd Place: Carmel Higher Secondary School, Nuvem
- 3rd Place: Rosary Higher Secondary School, Navelim

College Category

- 1st Place: Ganpat Parsekar College, Harmal
- 2nd Place: Dhempe College of Arts & Science, Miramar
- 3rd Place: Carmel College for Women, Nuvem



A DBT session on 'Essentials of herbal topicals'

A talk was organized for FY and SY SEC Chemistry students titled 'Essentials of Herbal topicals'. The resource person for the session was Dr. Supriya Hyam, R & D Manager, Amsar Goa Pvt. Ltd, Colvale, who shared valuable insights on cosmetics products and formulations including, lotions, creams, gels, and various skin care products, and advantages of using natural based ingredients like shea butter, beeswax, etc. She showed various samples of natural based cosmetics excipients and demonstrated their differences based on the processing techniques adopted.



The event was coordinated by Ms. Kathleen Pinto (Head of Chemistry Dept.), Mr. Clarence Rodrigues and Dr. Rheane DaSilva.

The talk was attended by over 58 SEC students (46 SY+ 12 FY) and around 8 faculty members.





National Science Day Celebrations

As part of the National Science Day 2024 'Open Lab Day' celebrations, the Dept. of Chemistry welcomed approximately 450 school students from schools across Goa including Holy Cross HS, Siolim, Holy Cross HS, Bastora, SFX HS, Mapusa, St. Anne's HS, Thivim, Vidya Vikas Academy, Margao, St. Alloysius HS, Benaulim, Our Lady of Rosary HS, Mandrem, New Goa HS, Mapusa, Sacred Heart HS, Parra, SFX HS, Mapusa and SFX HS, Siolim. Several exhibits, demonstrations and an interactive session based on chemistry concepts were designed and creatively presented to awaken scientific temper and foster the spirit of enquiry among young minds.



The Mascot of the department Mr. Jonathan Savio (F.Y.B.Sc.) played the subject superhero 'Iron Man' based on the character from the Marvel Universe, wearing a lab coat with pictures of iron ores and decorated with green crystals to resemble an oxidation state of Iron. As the chest piece, the symbol of the element Iron that is "Fe" was placed. The mascot from the Dept. of Chemistry was awarded the second place.

Students of F.Y.B.Sc. conducted a fun quiz with different rounds of questions based on the periodic table of elements, chemistry riddles and questions based on scientific processes which saw enthusiastic participation from the visiting school students.



'Fizzy Potions' was a fun demo by students of F.Y.B.Sc., showcasing the fizzy effects of bubbles of carbon dioxide gas produced by mixing citric acid and sodium bicarbonate to which coloured water was added to produce a fizzy bubbling effect.

Changing 'Water to Wine' was another skilfully presented demonstration by students of F.Y.B.Sc., in which a colourless liquid 'magically' turns pink and back again to colourless simply by blowing into it. This demo evoked gasps of surprise among students.

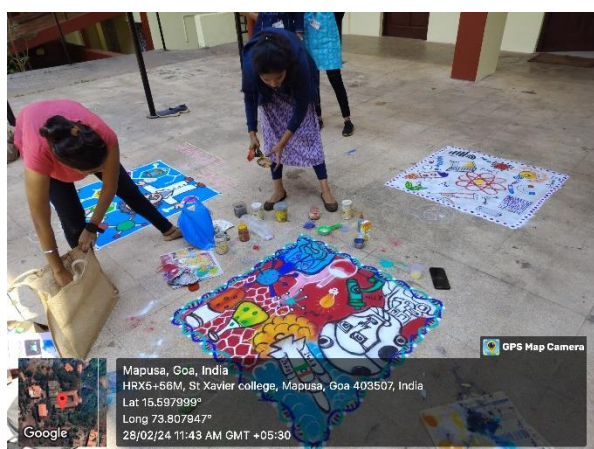
The final demonstration was 'Golden Rain' presented by students of S.Y.B.Sc. which was a stunning display of a suspension of glistening yellow crystals produced by the precipitation of lead iodide from a solution of potassium iodide and lead nitrate.

The teacher-in-charges from the department of Chemistry were Mr. Mahesh Nair, Ms. Milagrina D'Souza and Dr. Mira Parmekar.



Rangoli competition on 'Science in Day-to-Day Life'

To inculcate the spirit of scientific temper and to showcase the creativity of our students, the Chemistry Department organized a splash of colours in the form of 'Rangoli Competition' on the theme: 'Science in Day-to-Day Life'. A total of 6 teams comprising of two members each, participated in the same. The competition commenced at 9:30 a.m.



The participants created their unique artform on 90 x 90 cm area in two hours duration using sand based rangoli colours & had even made use of flowers & different leaves to enhance its aesthetic look. The Competition was judged by Ms. Sheryl D'Cruz, Ms. Flavia Travasso, Assistant Professors from UG Chemistry

Department & Ms. Fami Fernandes, Assistant Professor from PG department. The creative art was judged on the basis of relevance of the theme, Creativity, neatness and Overall effect. Throughout the competition the zeal and determination with which the participants were engrossed in their work was highly commendable.

The first place was secured by Ms. Richa Satelkar and Ms. Ranjusha Haldankar from SYBSc, second place by Ms. Sanisha Pereira and Ms. Saniya Kauthankar from TYBSc and the third place by Ms. Siya Palav and Ms. Siya Satardekar from SYBSc. The event was co-ordinated by Ms. Shraddha Piligaonkar, Assistant Professor, Department of Chemistry and was organised under the guidance of Ms. Kathleen Pinto, HOD of Chemistry Department.



Educational visit to Amsarveda

The educational visit to Amsarveda, Amsar, Colvale Industrial Estate was a part of learning the pedagogy of the Skill Enhancement Course, FY-UG NEP Programme 'Chemistry of Cosmetics and Perfumes'. The visit to this cosmeceutical facility offered the students a fascinating insight into the intersection of cosmetics and pharmaceuticals.

Cosmeceuticals are cosmetic products that claim to have medicinal or drug-like benefits due to their active ingredients.



At the facility, the students on arrival were welcomed by Dr. Supriya Hyam, R & D Manager and then taken inside the storage warehouse to show the raw material storage and weighing. Later they were sectioned into groups and taken inside the processing unit where the tablet formulation was shown. Following that the students were taken to the QC labs where first in the chemistry section the students were demonstrated the essential oil extraction on small scale using fractional distillatory.

Further in the biology section, they were demonstrated and explained the process of identification of the purity and quality of the extracted essential oil using HPTLC and matching it with the data in Ayurvedic pharmacopeia. The last section to be demonstrated was the R & D where tablet dissolution was explained using the just manufactured tablets. Following this the students were taken to the packaging section and told about various packaging sizes and safety measures followed during packaging and their transport.

The visit was co-ordinated by Dr. Mira Parmekar under the guidance of Head, Chemistry Department, Ms Kathleen Pinto. The 20 students were accompanied by Dr. Mira Parmekar and Ms. Milagrina D'Souza.



Annual T.Y.B.Sc. Quiz

The Annual Third Year Chemistry Students Quiz was held in the T.Y.B.Sc. Chemistry Classroom. About 50 students appeared for this intra-class written quiz co-ordinated by Dr. Mira Parmekar and Ms. Milagrina D'Souza. The purpose of the quiz was to increase the aptitude of the students towards the core subject knowledge. The

following students were the top scorers:



- 1st place: Sania Kovthankar
- 2nd place: Ms. Saloni Mandrekar
- 3rd place: Ms. Sanisha Pereira,
- 4th place: Ms. Swezel Mendes
- 5th place: shared by Ms. Amisha Kumari and Mr. Swarajya Patil

The students were thrilled to answer the quiz which would prepare them for their future job prospects. Dr. Johnross Albuquerque and HoD of Chemistry, Ms. Kathleen Pinto supported in the smooth conduct of the Quiz.



Demonstration on 'Soil and Water sampling techniques'

Under the DBT Star College Scheme, an hands-on training session on 'Soil and Water Sampling Techniques' was organized for the F.Y.BSc. SEC Chemistry Students who have opted for the paper CHC-141: Water and Soil Analysis at the Conference Hall Post Graduate Block of St. Xavier's College. The Resource Person for the session was Mr Satish Patil Assistant Professor of Soil Science and Agricultural Chemistry at Goa College of Agriculture.



Mr. Satish Patil passionately explained how soil and water sampling is a vital process used to gather representative soil and water samples from different locations to understand the composition, fertility and health of the soil and pH, conductivity of water. Mr. Satish Patil explored the most common tools for soil sampling and practically demonstrated soil sampling techniques on the college campus using shovel/hand trowel method and auger method.



- Shovel or Hand Trowel Method: This technique is straightforward and requires minimal equipment. Using a shovel or a hand trowel, small pits or holes at various locations across the area of interest are dug. The soil samples are then collected from different depths within the pit and mixed together to form a composite sample. It's a quick method suitable for basic soil assessment.
- Auger Method: Augers are handy tools that allow collection of deeper soil samples with ease. There are various types of augers, but they generally involve a rotating helical screw that drills into the soil. This technique is valuable for studying soil profiles and identifying soil layers at different depths.

The students then moved to the chemistry laboratory for analysis of soil samples for their soil texture. Soil Texture indicates the relative content of particles of various sizes, such as sand, silt and clay in the soil. Soil texture influences the ease with which soil can be worked, the amount of water and air it holds, and the rate at which water can enter and move through soil.



The students enthusiastically participated in the hands-on session while gaining knowledge connecting this new knowledge with knowledge and concepts that they already learnt in the classroom.

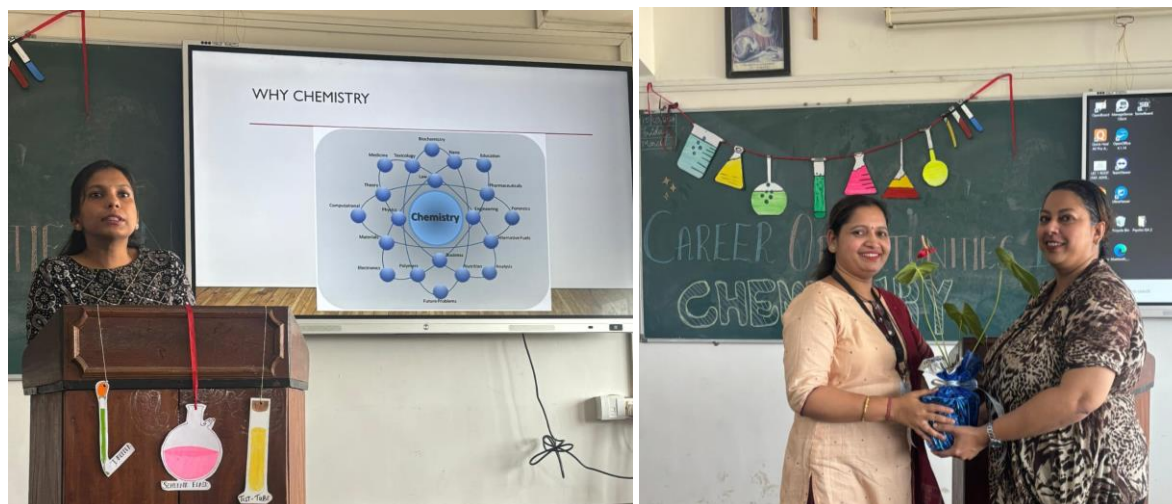


Session on Career Opportunities in Chemistry

An insightful session on Career Opportunities in Chemistry was organized by the Dept. for the students of S.Y.B.Sc. The session aimed to provide students with valuable insights into both industrial and academic career paths within the field of chemistry.

In classroom no. 218 at 9:30 a.m., the session commenced with a warm welcome extended to the esteemed guests, Ms. Yekshita Parab, a Process Development

Scientist at Deccan Fine Chemicals Pvt. Ltd., and Ms. Mamta Prabhugaonkar, Assistant Professor at the PG section of St. Xavier's College, Mapusa, Goa.



Ms. Sheryl D' Cruz graciously welcomed the guests with potted plants, setting a tone of appreciation and gratitude for their presence. Ms. Ishika Chodankar from S.Y.B.Sc. introduced Ms. Yekshita Parab, who shared her enriching industry experiences and provided valuable insights into the workings of the chemical industry. Ms. Parab elaborated on her journey as a process development scientist, offering students a glimpse into the practical applications of chemistry in real-world scenarios.

Subsequently, Mr. Avez Khan from S.Y.B.Sc. introduced Ms. Mamta Prabhugaonkar, who engaged with the students and encouraged them to explore various career opportunities in the field of teaching. Ms. Prabhugaonkar emphasized that teaching extends beyond school and higher secondary levels, encompassing roles in colleges and universities, thereby highlighting the diverse career paths available in academia. The session concluded with a token of appreciation presented to the esteemed guests as a gesture of gratitude for sharing their valuable insights and experiences. The Vote of Thanks was delivered by Dr. Rheane Da Silva. Mr. Vedant from S.Y.B.Sc. compered the session. The coordination of the event was overseen by Ms. Kathleen Pinto, HOD of the Chemistry Department, and Dr. Rheane Da Silva.



Industrial Visit to Glenmark Pharmaceuticals, Colvale

An industrial visit to Glenmark Pharmaceuticals, Colvale, Goa was organized for T.Y.B.Sc. and S.Y.B.Sc. Chemistry students who were accompanied by faculty members Mr. Clarence Rodrigues and Dr. Johnross Albuquerque. The students got the opportunity to see the QC and QA departments, interact with chemists from those departments, and see both wet labs as well as the various instruments like HPLC, IR etc that were in the

lab The trip was coordinated by Mr. Clarence, under the guidance of Ms. Kathleen Pinto, Head of Chemistry Dept.



Session on 'Stress Management and Life Skills'

An interactive session on 'Stress Management and Life Skills' was organized for the Third Year B. Sc. Chemistry students 2024 at 11:45 a.m. in Room No. 210. During this session, the resource persons: Ms. Zaneta D'Mello and Mr. Cipriano Fernandes (college counsellors) gave insights on social skills, thinking skills and emotional skills. The students got an opportunity to understand these skills through role plays, puzzle solving and case studies. The counsellors also highlighted the need for stress management and taught the students to take a meditative approach towards coping with stress. The session was coordinated by Ms. Kathleen Pinto, Head, Dept. of Chemistry and Ms. Flavia Travasso, Assistant Professor.





Educational tour to Kerala

An Educational tour to Kerala was organized for T.Y.B.Sc. Chemistry students from 7th May to 11th May 2024. Thirty-two students accompanied by three faculty members embarked on this educational tour to enhance their knowledge in the practical and research field. The group visited the Cochin University of Science and Technology (CUSAT), Kochi wherein they visited the Department of Polymer Science and Rubber Technology.



Dr. Prasanth Raghavan, H.o.D warmly welcomed the group for this educational visit. During the visit, Ms. Sitara gave an explanation on the various instruments used in the research process at the department. Some of the instruments shown were Freeze Dryer/Lyophilizer Contact Angle Goniometer, Universal Testing Machine (UT) and the Dynamic machine analyser. At the Rubber Technology Laboratory, Ms. Aparna gave insights on the various instruments used there such as the Rubber processing analyser, Rheo Line Multi-Function meter, Mooney Viscometer, Melt flow tester, the internal mixer and the micro injection mould.

The group also visited the famous tourist destinations of Kochi such as St. Francis Church, Fort Kochi, Dutch Palace and the Jewish synagogue. The group later proceeded to Munnar wherein the famous places of tourist attraction visited were Spice Plantation, Chocolate Factory, Kundala Lake, Echo Point, Mattupetty Dam, Gap Road, Tata Tea Museum and Tea Factory. The educational tour was a very wonderful learning experience for the students and faculty members.

The entire tour was coordinated by Ms. Kathleen Pinto, H.o.D, Ms. Shivta Mhamal and Ms. Flavia Travasso, Assistant Professors, Department of Chemistry.



Echo Point, Munnar



Chem-School: where Chemistry gets exciting (6-Day Summer School)



The last event for the academic year 2023 - 2024 was a 6-day Summer Schol 'Chem-School: where Chemistry gets exciting', conducted for std. XII studying HSS Science students. The duration of the summer school was from 28th May 2024 till 3rd June 2024 and this event was funded by Goa State Research Foundation (GSRF), Government of Goa.

About 34 students from 9 HSS's across the State of Goa registered for the event. The various HSS's are (1) Government HSS, Sankhalim (2) St. Francis Xavier HSS, Soilim (3) Shri. Shantadurga HSS, Bicholim (4) St. Xavier's HSS, Mapusa (5) St. Diogo Vaz HSS, Colvale (6) St. Thomas HSS, Aldona (7) Harmal Panchakroshi HSS, Harmal (8) DM's PVS Kushe HSS, Assagao and (9) Purushottim Walawalkar HSS, Mapusa.



The resource person for the first day (28th May 2024) was Mr. Clarence Rodrigues who took the theory and practical session on Chromatography. Mr. Clarence introduced the topic of Chromatography (which is a technique to separate compounds), explaining the various terms involved in chromatography (viz. stationary phase, mobile phase, retardation factor, etc.) and brief classification of chromatography.

During the practical session, students performed the experiment of separating a mixture of compounds (o-nitro aniline and o-nitro phenol) using paper chromatography and calculated retardation factors for the separated components and comparing with the pure compounds.

They also separated the mixture of anthracene, aniline and o-chlorobenzoic acid using the thin layer chromatography. The separated compounds were identified based on visualization of separated components using iodine chamber and UV

chamber. Unlike paper chromatography, students had to prepare the TLC plates using silica gel, ensuring that the gel prepared not viscous.

After a short Inaugural function on the second day (29th May 2024), the first resource person for the day, Dr. Rheane Da Silva delivered a theory session on the Chemistry of Perfumes where the students got insights about the different methods of extraction of essential oils. This was supported by the practical session which dealt with extraction of volatile oils from lemon grass and orange peel via. steam distillation process.



During the second lecture session on the same day, Ms. Milagrina D'Souza spoke on the Chemistry of Cosmetics while during the practical session, students prepared two types of soaps during the practical session.



The resource person for the third day (30th May 2024) of the Summer School was Dr. Andrew D'Souza. who delivered theory and practical sessions on Soil and Water Analysis. During the theory session, Dr. Andrew explained what essential nutrients / micro and macro nutrients (with respect to soil) are; and he also covered topics like soil texture, various sampling techniques and aspects of water pollution. The practical sessions covered sampling techniques of soil, determining acidity, conductivity, alkalinity, dissolved carbon dioxide and hardness of water samples using titrations.



The resource person for Day -4 (30th May 2024) was Dr. Johnross Albuquerque who delivered lecture and practical sessions on Volumetry. The theory session covered fundamental principles of concentration: molarity, normality, equivalent and molecular weights, how to prepare standard solutions. The session was supplemented with problem solving approach where students calculated the amounts of substances to be weighed for preparation of solutions of various strengths. The experiments for the practical session were to determine neutralization reaction endpoints using conductometric and potentiometric titrations.



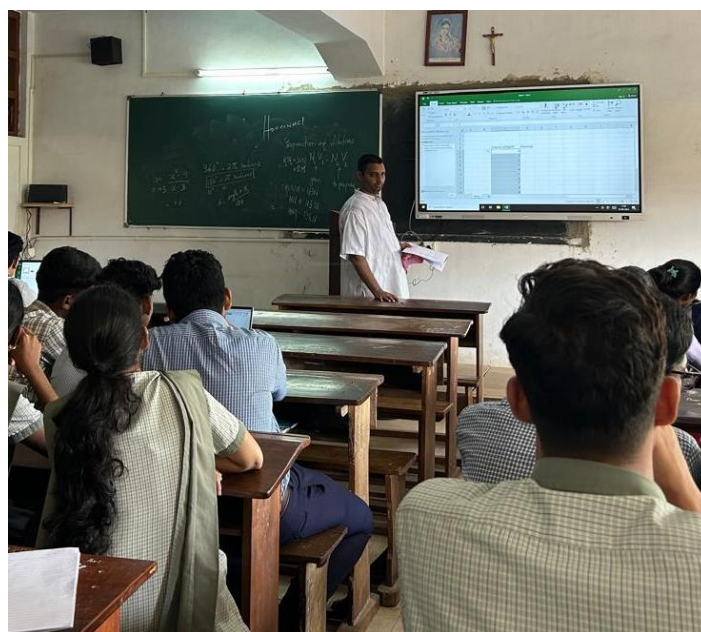
The topic on the 5th day (1st June 2024) was pH, acids and bases. The resource person, Dr. Mira Parmekar who during the first theory session covered the concepts of acids and bases; giving examples of each, followed by the Arrhenius, Bronsted and Lewis concepts of acids/bases with their limitations. There were also numerical

problem solving on pH and pH scale. During the first practical session, students learnt the working and calibration of pH meter. They also learnt how to find pH of different water/ food samples and how to perform titrations using pH meter.

During the second theory session, the students learnt on buffers, their working with examples of various buffers and on natural and chemical indicators. The second practical session was based on checking pH range of all indicators discussed during the theory class and finding pH of gases.



On the last day (3rd June 2024) of the summer school, the morning session was conducted by Dr. Johnross Albuquerque where the students learnt about Microsoft Excel and how to use to determine reaction endpoints using MS Excel.



The second theory session was taken by Dr. Mira Parmekar who explained the software ChemSketch. Students also had hands-on experience of the software on their laptops during the practical session where they learnt how to draw and name various organic molecules. The summer school ended with a short valedictory programme where certificates were given to the registered participants. Some students also shared their experience of the Summer School. The programme ended with the National Anthem.





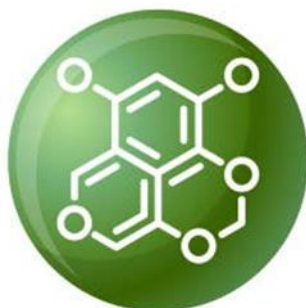


In order to encourage our students to explore and acquaint them with work culture in real work environment, the Department of Chemistry, organised an internship programme for Chemistry students of S.Y.B.Sc and T.Y.B.Sc. Under this collaboration 23 students were placed in various pharma industries to learn and study the best technologies employed in today's industries and to understand the latest instrumentation techniques used in chemical analysis. This experience also enables them to learn about latest norms in FDA regulations throughout the world and help sharpen their skills; while also helping them relate with topic they learn in their course.



The period of internship varied from one month and 10 days. The programme was coordinated by Ms. Kathleen Pinto (HoD of Chemistry) and Mr. Clarence Rodrigues.





Teacher – Progression Report



PEDAGOGY AND EDUCATION TECHNOLOGIES

Ensuring academic excellence for all students is a fundamental goal of all educational Institutions. However, this goal presents a unique challenge: providing effective support to both underperforming and high-achieving students simultaneously.

Digital education is an umbrella term for pedagogical practices and various education technologies. Pedtech is about putting pedagogical ideas first, and the technology serving those ideas.

As part of the implementation of National education Policy-2020, Ms. Edwina Pereira, In- Charge, requested the faculty to adopt various pedagogies/education technologies, in learning as well as assessment that would facilitate student-centered teaching and enhance the performance of all students.



LEARNING and ASSESSMENT PEDAGOGIES (ODD SEMESTER) 2023-24

Name of Faculty	Sub-topic	Pedagogy - Learning	Pedagogy - assessment	Class
Ms. Edwina R. Pereira	Quantum numbers	Group discussion	Topic round up / MCQs	F.Y.B.Sc. Major
Mr. Mahesh Nair	Chemistry of Cosmetics	Fact-finding and group discussion	Presentations	F.Y.B.Com. SEC
Mr. Clarence Rodrigues	Drugs	---	Quizzes & Presentations by students	T.Y.B.Sc.
Dr. Rheane Da Silva	Carboxylic acid	Collaboration and fact-finding	Quizzes	S.Y.B.Sc.
Ms. Flavia Travasso	Nomenclature of Drugs	Group discussion	Presentations	T.Y.B.Sc.
Ms. Janesline Fernandes	Periodicity of elements	Fact finding	MCQs	T.Y.B.Sc.
Dr. Johnross Albuquerque	Molecular Spectroscopy	Group discussion	Quizzes	T.Y.B.Sc.

Table continued...

Table continued...

Name of Faculty	Sub-topic	Pedagogy - Learning	Pedagogy - assessment	Class
Ms. Shivta T. Mhamal	Nuclear Chemistry	Fact Finding & field trip	Quizzes	T.Y.B.Sc.
Ms. Milagrina D'Souza	Acid-Base theories	Reflective, Inquiry based	Platform quiz	F.Y.B.Sc. Minor
Sheryl D'Cruz	Electrochemistry	Group Discussion, Quiz by the students	MCQs	T.Y.B.Sc.
Dr. Mira Parmekar	Chemistry of Perfumes	Fact-finding and group discussion	Class Presentations	F.Y.B.Sc. SEC
	Wood-ward Fieser Rules/ Name Reactions	Experiential Learning, Critical thinking	Quiz	S.Y.B.Sc.
	Energy Efficient Techniques in Organic Synthesis	Collaboration, Self-learning	MCQ Quiz	T.Y.B.Sc.
Dr Andrew D'Souza	Chromatography	Inquiry-based Learning	MCQs	F.Y.B.Sc.
	Analysis of Soil	Inquiry-based Learning	MCQs	F.Y.B.Sc. SEC



The Department of Chemistry conducted a series of sessions on the National Education Policy 2020 in the month of October for its faculty members. Teachers of the department were grouped together, and each group was allotted a topic from the NEP document and was supposed to present the same for a duration of around 10 minutes.

The first introductory session was taken by Ms. Edwina Pereira, In-charge of Chemistry Department on 7th October 2023. Following the first session, faculty

members of the remaining groups (Mr. Mahesh Nair, Ms. Sheryl D’Cruz, Dr. Andrew D’Souza, Dr. Mira Parmekar, Ms. Milagrina D’Souza, Mr. Clarence Rodrigues and Dr. Johnross Albuquerque) also presented their topics on subsequent days.

Dr. Andrew D’Souza and **Dr. Johnross Albuquerque**, Assistant Professors attended a One-Day program on ‘Research Grant Writing Workshop’ on 9th September 2023. This was conducted by the Directorate of Higher Education, Government of Goa in collaboration with National Oceanography Institute (NIO), Dona Paula at SCERT building, Porvorim. The resource persons described the various schemes available for teaching faculty to conduct research at their institutes and how to qualify for those grants. This discussion was followed by a brief overview of writing a research grant – the do’s and the don’ts with illustrations. The workshop ended with a panel discussion with the resource persons.



Ms. Shivta T. Mhamal and **Ms. Flavia S. Travasso** attended a Refresher Course in Environmental Sciences conducted by HRDC, Goa University in an online mode from 3rd to 16th October 2023. The range of topics covered by the resource persons were very comprehensive, from the basics of environmental science to more advanced topics such as climate change and sustainability. The course provided a deeper understanding of ecosystems and biodiversity. water resource management and environmental pollution are two of the most pressing challenges facing our world today, the resource persons gave a better understanding of these issues and ways to identify their potential solutions and also touched upon laws and acts for their conservation.



Dr. Mira Parmekar participated in the NEP Orientation & Sensitization programme from 16th to 26th October 2023 for the faculty members of the Colleges and the Universities (including Professors, Associate Professors, Assistant Professors) held online. The workshop was organized by UGC-Malaviya Mission Teacher Training Centre (formerly known as Human Resource Development Centre), Goa University. Over the course of 10 days, the various topics discussed were (1) skill development; (2) academic leadership, governance and management; (3) information & communication technology; (4) Indian knowledge system; (5) holistic and multidisciplinary education; (6) research and development; (7) higher education and society/student diversity; and (8) inclusive education. Faculty members having required attendance and qualifying the assessment test were awarded certificates.



Mr. Mahesh Nair and **Mr. Clarence Rodrigues** attended the teachers training workshop conducted at the Talent Development Centre (TDC) of the Indian Institute of Science (IISc)-Challakere Campus, Chitradurga, Karnataka from 25th October to 11th November 2023. The workshop was organised and coordinated by the Directorate of Higher Education, Govt. of Goa, for a group of approximately sixty teachers across different undergraduate colleges in Goa; consisting of both lecture and practical sessions based on learning by doing and experiential exercises. Sessions were engaged by scientists from various departments of IISc, all experts in their respective fields, involved in ongoing research, and on the cutting edge of science. The topics covered included quantum mechanics and Schrodinger's equation, coordination chemistry, electrochemistry, spectroscopy, organic synthesis and carbohydrate chemistry among others. Teaching learning sessions involved the introduction of novel strategies and new experiments specially designed to challenge thinking and clarify concepts.



Dr. Johnross Albuquerque attended a two-day national level online workshop – Transformation through NAAC Accreditation Process on 30th and 31st October from 10:00 a.m. to 6:00 p.m. this workshop was conducted by Institute for Academic Excellence (IAE), Hyderabad. There were different resource persons who discussed the various NAAC criteria (from 1 to 7) and on Self Study Report (SSR).



Ms. Milagrina D'Souza presented a poster on her research work at the 3rd International conference on 'Modern Trends in Inorganic Chemistry' held during 14th – 17th December 2023.



Two faculty members from the Department of Chemistry: **Ms. Milagrina D'Souza**, **Dr. Johnross Albuquerque** and three non-teaching staff members: **Ms. Susmita Parab**, **Mr. Douglas De Souza** and **Mr. Savio Coutinho** attended a one-week National workshop "Operation and Maintenance of Laboratory Equipment" at the college campus from 8th to 12th January 2024 which was organized by the Department of Microbiology in collaboration with Western Regional Instrumentation Centre (WRIC), Mumbai.



During these days, the participants learnt the theories of various instruments such as pH meter, conductivity meter, multimeter, function generators, colorimeters, spectrophotometers, CRO, etc. There were hands-on sessions on these instruments as well where the participants learnt on how to repair and maintain them.



Dr. Mira Vinayak Parmekar, Assistant Professor of Chemistry of St. Xavier's College, Mapusa-Goa, was designated to be the resource person for the Vidnyan Dhara Mega Science Series 2024, organised by Directorate of Higher Education (DHE), Porvorim. Dr. Mira delivered two sessions titled "Learning Chemistry the fun way" on 5th February 2024 and 15th February 2024 at Shri Ram Vidya Mandir, Colvale, Bardez and Our Lady of Rosary High School, Mandrem respectively.



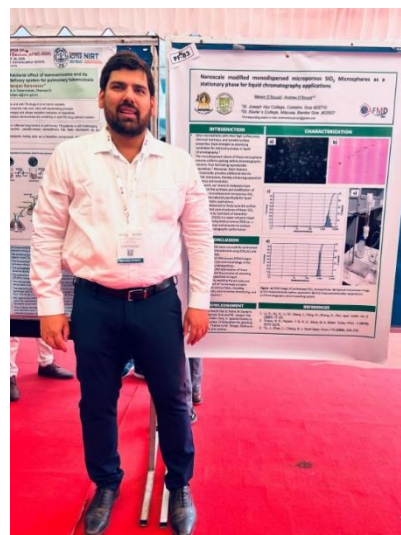
She elaborated on the techniques of Chromatography in separation of primary colors, chemistry in kitchen with the help of natural indicators and sensing pH of gases via demonstrations, conducted with the help of the school students. The sessions were deeply appreciated by a student of Std. V to IX with a profound interest in Chemistry. The efforts of outreaching and promoting basic science were upheld by the DHE as well and she was presented with appreciation certificate for the same at the Valedictory function of Vidnyan Dhara 2024 on 19th March 2024.



Dr Andrew D'Souza participated in the 3-day DBT BUILDER Bioprocess Technology Workshop from 20th to 22nd February 2024, organised by the Department of Biological Sciences, BITS Pilani, K. K. Birla Goa Campus. This workshop covered operations of several instruments like (1) continuous/ floor model centrifuge, (2) tangential flow filtration system, (3) fast protein liquid chromatography, (4) size exclusion liquid chromatography, (5) HPLC and (6) in-situ sterilizable 50 liter fermenter.

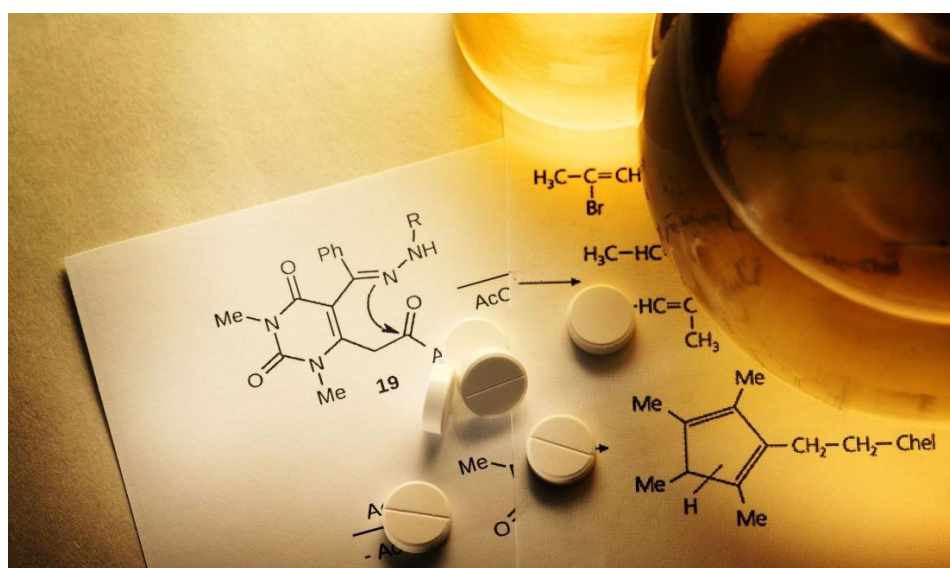


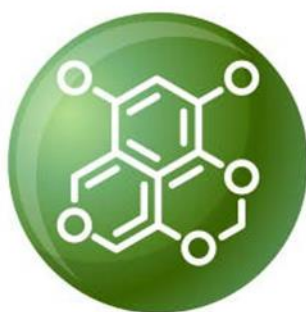
Dr. Andrew Joseph D'Souza participated and presented a poster at an international conference on 'Advanced Functional Materials and Devices – 2024' from 26th February to 29th February 2024 organised by Nanotechnology Research Centre (NRC) at SRMIST.



Ms. Kathleen Pinto presented an oral presentation on **“An alternate method for the synthesis of medicinally important Biscoumarins”** at the 2 day International Conference on “Green Chemistry and Intellectual Property for United Nations Sustainable Development Goals” organized by Department of Chemistry, DM's College and Research Centre, Assagao in association with Directorate of Higher Education, Government of Goa on 22nd and 23rd March 2024.







Student Awards and Recognitions



Our T.Y. BSc Chemistry students Mr. Swarajya Patil and Ms. Saniya Kovthankar won the First Place at the Intercollegiate Oral Quiz Competition on the topic Green Chemistry and Laboratory Safety for Better Sustainability Organized by Department of Chemistry, Dnyanprassarak Mandal's College and Research Centre, Assagao – Bardez, Goa in Association with Deccan Pharmaceuticals. The subject Green Chemistry is a part of the third year Chemistry curriculum. The students were mentored by the subject teachers Dr. Mira Parmekar and Dr. Rheane da Silva under the guideship of Departmental In-Charge Ms. Edwina Periera.



Our T.Y. BSc Chemistry students Mr. Swarajya Patil and Ms. Saniya Kovthankar won the Third Place at the Intercollegiate Quiz Competition organized by ACT at Goa University on 2nd February 2024. The students were mentored by Assistant Professor's Dr. Mira Parmekar, Dr. Rheane Da Silva and Ms. Milagrina D' Souza under the guideship of Ms. Kathleen Pinto, Head of the Department of Chemistry.



A team of 15 students of F.Y.B.Sc., S.Y.B.Sc. and T.Y.B.Sc. comprising of Ms. Ritusha Palyekar (team leader), Ms. Ishika Chodankar, Ms. Diya Malik, Ms. Sunidhi Naik, Ms. Ostira D'Souza, Ms. Merlyn Fernandes, Ms. Khushi Gad, Ms. Saloni Karapurkar, Ms. Anezka Fonseca, Ms. Riya Pednekar, Ms. Sejal Shetkar, Ms. Sonia Salkar, Ms. Gautami Desai, Mr. Shivang Shirodkar and Mr. Swarajya Patil, titled Team Entropy Eagles represented St. Xavier's College at an Inter-collegiate Chemistry event Chemtalsea 5.0, organised by DM's College, Assagao on 6th March 2024. The team won:

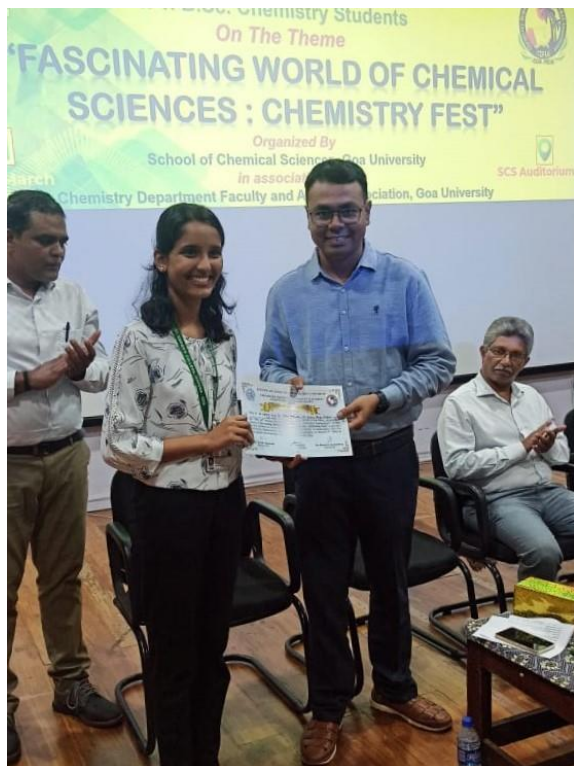
- **FIRST** place for the events: Surflame (Singing) credited to Ms. Ostira D'Souza and Ms. Merlyn Fernandes, and Chemball (Dance) credited to Ms. Ritusha Palyekar, Ms. Ishika Chodankar, Ms. Diya Malik, Ms. Sonia Salkar, Ms. Sunidhi Naik and Ms. Gautami Desai.
- **SECOND** Place for the events, Eco hunt (Treasure hunt) credited to Ms. Saloni Karapurkar and Mr. Shivang Shirodkar, and Let Colours Dance (eco painting) credited to Ms. Khushi Gad and Ms. Sonia Salkar.
- **THIRD** place for the event Chemspell (Word puzzles) credited to Ms. Anezka Fonseca and Ms. Riya Pednekar.



The team overall emerged as the First Runners-up for the Intercollegiate competition. Dr. Mira Parmekar and Ms. Milagrina D'Souza were the faculty in charge for the participation. The efforts of Ms. Kathleen Pinto, HoD Chemistry for her support and encouragement to participate in the event was highly appreciated.



School of Chemical Sciences, Goa University in association with Chemistry Department Faculty and Alumni Association (CDFAA), Goa University organised **16th Annual One Day Symposium** on the theme, **“FASCINATING WORLD OF CHEMICAL SCIENCES”** for the T. Y. B.Sc. Chemistry Students of Science Colleges in Goa on Saturday, 9th March 2024. This Symposium gives an opportunity to the T. Y. B.Sc. Chemistry students from all over the state to participate and present their T.Y. B. Sc. project work in the symposium. Dr. Dnyaneswar Gawas, Senior GM, Unichem Laboratories Ltd., Pilerne was the Chief Guest of the function. Venue for the event was Auditorium, School of Chemical Sciences, Goa-University and Dr. Rohan Kunkalekar was the Convener.

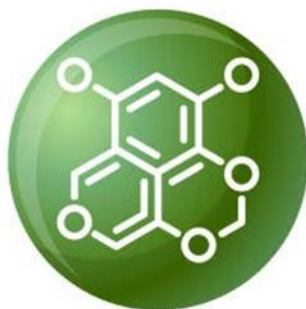


Along with the Third-Year students who participated in the event, 3 faculty members who were guiding these students for their projects also accompanied them. The Competition here occurred in two categories of which **Ms. Dalcy Fernandes secured 2nd Place in the Oral presentation** for her project work titled "Substituted Ferrites for Catalytic and Antimicrobial applications" guided by Dr. Mira Parmekar.

Mr. Aneesh Pal and Ms. Srushti Gawas also presented their work titled "Synthesis and Study of metal aluminates" and "Characterization and Identification of Organic compounds in Moringa Oleifera" carried out under the guidance of their accompanying guides Ms. Milagrina

D'Souza and Dr. Rheane Da Silva respectively for the Poster competition. Later, the students were taken around to show the departments instrumental facilities by the accompanying teachers. Overall, it was a very enriching experience for the students. The efforts of Ms. Kathleen Pinto, HoD Chemistry for her support and encouragement to participate in the event was highly appreciated.





Student's Corner



Green Chemistry: Innovations for a Greener Planet

Green Chemistry is an essential thing now a days wherein we can prevent many tragedies and control environmental damages. The tragedies that took place in past like Chernobyl Disaster, Love Canal, Bhopal Gas Tragedy and many more, would have been easily prevented if proper care taken i.e. if the workers that were working there were trained and had some experience.

There are two famous personalities in the field of Green Chemistry: Prof. Paul Anastas and Prof. John Warner who promote Green Chemistry throughout world.



The EPA (Environment Protection Act) was established at Beyond Benign, Centre for Green Chemistry and Green Engineering, Yale, ACS(American Chemical Society) Green Chemistry Institute, GCCE(Green Chemistry Centre of Excellence) at York.

Along with this there are twelve principles which depict waste prevention, atom economy, use of less hazardous chemicals, designing safer chemicals, use of safer solvents and auxiliaries, design for energy efficiency, use of renewable feedstock, reduce derivatives, catalysis, design for degradation, real time analysis for pollution prevention and the last inherently safer Chemistry for accident prevention. This last principle is known as the safety principle of Green Chemistry and also deals with PPE (Personal Protection Equipment's).

Green Chemistry is a design of chemical product and processes that reduces or eliminates the use and generation of hazardous substances, it is also known as Sustainable Chemistry: a Chemistry that is Benign by Design also embosses for pollution prevention at the molecular level.

Mr. Sudhanshu S. Halarnkar
S.Y.B.Sc. Chemistry,
2024 - 2025



Chemistry: The Marvelous Science Behind Everyday Magic

Chemistry might not always be the first subject that springs to mind when thinking about excitement or wonder, but it truly is the science of magic in our everyday lives. Imagine a world where nothing changes or reacts — no fizzy drinks, no vibrant fireworks, and certainly no delicious chocolate. Chemistry, the science of matter and its interactions, is behind all these delightful phenomena, making it one of the most enchanting disciplines you can explore. Let's embark on a journey through the whimsical world of chemistry, where scientific principles create everyday marvels.

1. Bubbles and Fizz: The Chemistry of Soda

Pop open a can of soda, and you're greeted with a symphony of bubbles and fizz. This bubbly effect is thanks to chemistry at work. Soda contains carbon dioxide (CO_2) dissolved under pressure. When you open the can, the pressure drops, causing the CO_2 to escape in the form of bubbles. This reaction not only creates the fizzy sensation but also delivers a satisfying auditory and tactile experience. Chemistry is truly responsible for turning a simple drink into a fizzy party!



2. Fireworks: A Colourful Chemical Display

Ever gazed up at the night sky and marveled at the explosion of colors during a fireworks display? Chemistry is behind these spectacular shows. Fireworks are packed with metal salts that produce vivid colors when burned. Strontium salts create red hues, copper compounds yield blue, and sodium compounds emit bright yellow. Each metal, when heated, emits light at specific wavelengths, resulting in the dazzling display of colors we see in the sky.



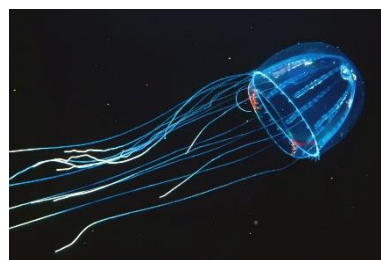
3. The Sweet Science of Chocolate

Let's talk about one of the most universally loved treats: chocolate. The chemistry of chocolate is nothing short of enchanting. When cocoa beans are processed, their fat, known as cocoa butter, melts at body temperature, giving chocolate its smooth, melt-in-your-mouth texture. The Maillard reaction, a chemical reaction between amino acids and sugars, is responsible for the rich flavours that develop during roasting. So, every bite of chocolate you enjoy is a delightful result of complex chemical reactions.



4. Glow-in-the-Dark Fun: The Magic of Bioluminescence

Imagine walking along a beach and seeing the waves light up with a mesmerizing blue glow. This phenomenon, known as bioluminescence, occurs due to chemical reactions in certain marine organisms like jellyfish and algae. These organisms produce light through a reaction between a light-emitting molecule called luciferin and an enzyme called luciferase. This natural glow is not only beautiful but also a testament to the wonders of chemistry.



5. Chemistry in the Kitchen: Culinary Alchemy

Cooking is essentially a magical chemistry experiment. When you bake a cake, baking powder releases carbon dioxide gas when heated, causing the cake to rise. The browning of meat, known as the Maillard reaction, creates complex flavors and aromas that make your meal irresistible. Even the crispy crust of your pizza is a result of chemistry. So next time you're cooking up a storm, remember you're a chef-scientist creating tasty chemistry!



6. Invisible Forces: The Science Behind Static Electricity

Ever rubbed a balloon on your hair and watched as it stuck to the wall or made your hair stand on end? That's static electricity, a fascinating aspect of chemistry. It occurs when electrons are transferred between objects, creating a charge imbalance. This phenomenon is a playful demonstration of how chemistry governs the forces we interact with every day, even if they're not always visible.

Conclusion: Chemistry's Everyday Magic

Chemistry might seem like a serious science, but its magic is woven into the fabric of everyday life. From the fizz in your drink to the colors in fireworks, the texture of chocolate, and the glow of bioluminescence, chemistry is the hidden artist behind many of life's wonders. So next time you experience a delightful surprise, remember that chemistry is the enchanting force making it all possible. Embrace the wonder of this marvellous science, and you'll see the world in a whole new light—one filled with magic, color, and a touch of scientific wonder.

Ms. Ishika Sandesh Chodankar
T.Y.B.Sc.
2024 - 2025



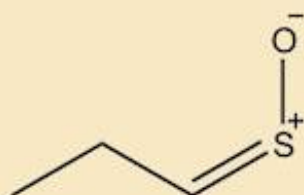
Chemistry of an Onion



AMINO ACID SULFOXIDES



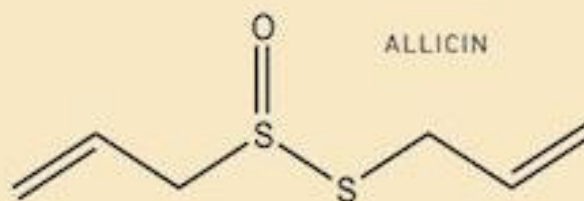
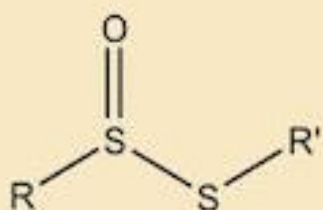
1-PROPENESULFENIC ACID



SYN-PROPANETHIAL-S-OXIDE

As onions are sliced, they release a class of enzymes, allinases, which break down amino acid sulfoxides. A specific compound produced during this process is 1-propenesulfenic acid, which is rearranged by another enzyme, called lachrymatory factor synthase, to produce syn-propanethial-S-oxide. Production of this gas peaks 30 seconds after mechanical damage to the onion, and it stimulates sensory neurons in the eye causing a stinging sensation; the eye therefore produces tears to flush it out.

ONION ODOUR & THIOSULFINATES



ALLICIN

Thiosulfinates are the primary flavour and odour producing molecules in an onion. These compounds are not present in intact bulbs, but are formed via enzymatic reaction from sulfur amino acids. Allicin is one of these compounds, which in turn quickly breaks down to form other sulfur-containing compounds.

Mr. Harsh Bhagat, Mr. Madhukar Govekar,
Mr. Atharva Gadekar & Mr. Gauresh Mandrekar
T.Y.B.Sc. 2024 – 2025

