

Cadet College Hasanabdal 2024-25 Igniting Curiosity, Fostering Discovery



"Chemistry is the science of molecules and reactions, but it is also the art of understanding matter and its transformations. Join us as we explore the beauty and complexity of the chemical world."





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Brief History of the Chemistry Club

The Chemistry Club at Cadet College Hasanabdal (CCH) has long been a cornerstone of scientific curiosity and academic enrichment at the institution. While formal records do not state an exact founding date, credible accounts and indirect references suggest that organized chemistry-related activities began around 1976, during a period when co-curricular science societies were becoming more common in elite educational institutions in Pakistan.

In its early years, the Chemistry Club was likely an informal extension of classroom learning, where passionate teachers encouraged students to engage in experiments, demonstrations, and science exhibitions. These early activities were often carried out under the umbrella of the broader Science Society, which included cadets from all scientific disciplines. Chemistry projects—ranging from model volcanoes and chemical reactions to displays on acids, bases, and industrial processes, were regular features of the Annual Science Exhibition, a much-anticipated event on the college calendar.

In more recent years, particularly in the 2010s and beyond, the Chemistry Club has embraced a more structured and modern approach. The club now serves multiple roles: supporting students in Cambridge O and A Level Chemistry, organizing labbased learning sessions, preparing cadets for national and international Olympiads, and hosting chemistry-themed awareness campaigns such as Green Chemistry Week and World Water Day.

One of the unique strengths of the club is its tradition of peer mentoring, where senior cadets help juniors understand complex topics and demonstrate lab techniques. This fosters a collaborative environment and strengthens bonds across year groups. The club also collaborates with the Biology and Physics Clubs on interdisciplinary events, including science quizzes, poster presentations, and innovation challenges.

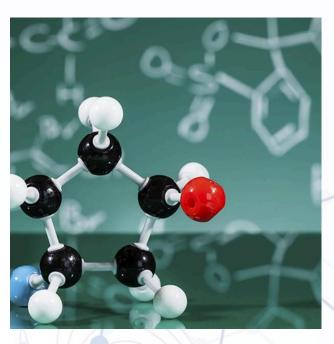
Today, the Chemistry Club continues to be an integral part of the co-curricular life at Cadet College Hasanabdal. It stands as a vibrant platform where scientific thinking is nurtured, innovation is encouraged, and curiosity is celebrated, preparing Abdalians not only for academic excellence but for meaningful contributions to science and society.





Introduction

Welcome to the Chemistry Club of Cadet College Hasanabdal! Our main objective is to encourage and motivate students to explore the fascinating world of chemistry and how it connects to their daily life. Through hands-on activities and experiments, we strive to make learning chemistry an exciting and interactive experience.



Our club has developed a comprehensive five-year plan for students from 8th to 12th grade. The plan is flexible and adaptable, depending on advancements in the field of chemistry and situational changes. In the initial years, we focus on teaching basic chemistry related to daily life and coursework, helping students understand difficult concepts through experiments and applying those concepts to other subjects like Physics and Biology. We also aim to develop students' research skills, teaching them how to conduct research and transform it into experiments.

Chemistry can be a challenging subject, and our cadets may lack the equipment handling skills necessary to succeed in the laboratory. Therefore, our primary goal is to develop our students' minds into chemists who can apply their knowledge to contribute to the progress of their country. We also plan to broaden the horizons of our students' vision about the application of chemistry by visiting various chemical industries and coordinating with different universities and colleges to talk on different projects, which will be helpful in their future studies.





In addition to exploring the many fields of chemistry, our club aims to develop students' leadership and communication skills, while providing opportunities for service to their communities. We believe that through the Chemistry Club, students will discover and pursue connections within the larger chemistry community, and have a better understanding of the study and career opportunities available to them. We are excited to embark on this journey with our students, and we hope that they will find chemistry to be an enjoyable and rewarding subject. Please refer to the attached five-year plan for more information about our club's objectives and activities.



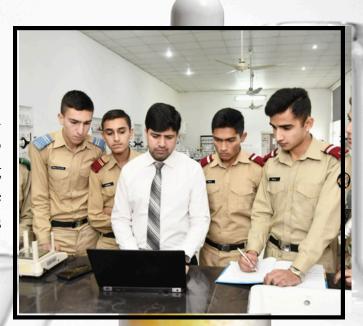


Club Aim

To cultivate a deep and lasting interest in chemistry by providing hands-on learning, experimentation, and exploration opportunities that enhance students' conceptual understanding, practical skills, and scientific thinking—while supporting their O and A Level studies and inspiring future pursuits in science and STEAM careers.

Club Leadership

The club is managed by a dedicated team of individuals who are committed to ensuring that all members have a fulfilling and enriching experience. The management structure of the club consists of the following positions:



Officer In-charge

This individual is responsible for the smooth running of the club. They plan various activities within and out of the campus, guide and assist students in their projects, and ensure that all club members are following the rules and regulations of the club.





President

The President is a cadet from class 2nd year who has shown great interest in scientific activities and projects throughout their stay in previous years. They work closely with the Officer In-charge to plan and implement various club activities, lead club meetings, and serve as a liaison between the club and the school administration.

Vice President

The Vice President is also a cadet from class 2nd year who has shown great interest in scientific activities and projects throughout their stay in previous years. They work closely with the President to support club activities and meetings, and assume the duties of the President in their absence.

Members

Within the hallowed halls of the Chemistry Club, five cadets from each class hold the coveted membership. These chosen ones are hailed for their zealous involvement in the club's undertakings and their contributions towards its triumphant spirit.

The Chemistry Club's implementation of a structured management team ensures its members receive a well-organized and engaging learning experience.

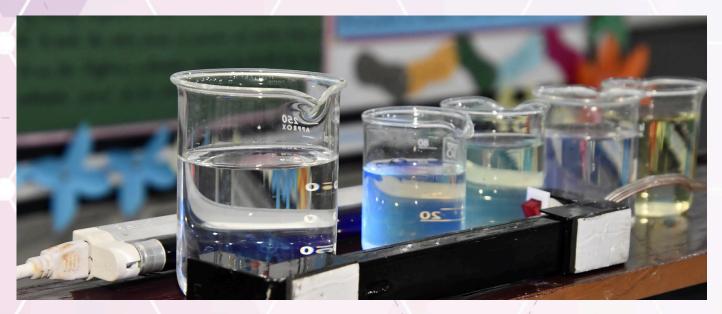




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Club Periods and activities



One of the most important aspects of being a member of the club is attending regular club periods and participating in club activities.

Club Periods: The Chemistry Club meets every Friday to discuss progress of current projects, plan future activities, and share ideas related to the field of chemistry. All members must attend these periods. These periods provide a valuable opportunity for members to connect with one another, share their knowledgeable experiences, and learn from one another.





Club Activities: The Chemistry Club organizes various activities throughout the year to help members explore different aspects of chemistry. These activities include field trips to chemical industries, visits to universities and colleges, participation in science fairs, and hands-on experiments. Members are encouraged to take an active role in planning and organizing these activities, as this helps to develop leadership and communication skills. In addition to club meetings and activities, the Chemistry Club also provides its members with access to various resources such as scientific journals, books, and online databases. These resources can help members to expand their knowledge and pursue their interests in the field of chemistry. We encourage all members to actively participate in club meetings and activities, and to take advantage of the resources provided by the club. By doing so, members can develop their skills and knowledge in the field of chemistry, and make meaningful contributions to the club and their community.

Club Code of Conduct

As an authority, the Chemistry Club OIC has the power to restrict access to the club from any individual who violates the established procedures. The following safety precautions must be strictly followed by all cadets who are members of the Chemistry Club:

- 1. Cadets are strictly prohibited from touching any equipment, chemicals or other materials in the laboratory area unless instructed by the Club OIC.
- 2. Before starting any club work, all written and verbal instructions must be carefully read and followed.
- 3. In case of any confusion or uncertainty, it is mandatory to ask the OIC for clarification before proceeding with the activity.
- 4. Equipment labels and instructions must be read carefully before use. In case of any confusion or uncertainty about how to use a piece of equipment, the OIC must be consulted for help.
- 5. Unauthorized experiments are strictly prohibited.
- 6. Cadets are not allowed to work in the Club alone or without the presence of the OIC or Lab assistant.



7. It is the responsibility of all cadets to protect themselves from electric shock or hazardous chemicals by following all established safety protocols and procedures.

These safety precautions are designed to ensure the well-being of all members of the Chemistry Club and must be strictly followed at all times. Failure to adhere to these precautions may result in disciplinary action, including the revocation of club access.

Club Resources



The Chemistry Club is committed to providing its members with access to a wide range of resources and support services to enhance their learning and research experience. These resources and support services include:

Laboratory facilities and equipment: The Chemistry Club provides access to well-equipped laboratories and modern equipment to carry out experiments and research projects.

- 1. **Library resources**: Members of the Chemistry Club have access to a vast collection of books, journals, and other resources related to chemistry and other related fields.
- 2. **Academic support:** The Club provides academic support services, including study groups and tutoring, to help members achieve their academic goals.
- 3. **Professional development:** The Club offers opportunities for members to attend conferences, seminars, and workshops to enhance their knowledge and skills in the field of chemistry.



4. Networking opportunities: The Chemistry Club provides a platform for members to connect with other students, professors, and professionals in the field of chemistry, thereby providing valuable networking opportunities. These resources and support services are designed to assist members of the Chemistry Club in their academic pursuits and career goals. The Club is committed to providing its members with the necessary tools and support to succeed in their chosen field.

Club Objectives

Grade 9 (Participant)



- 1. Spark curiosity about matter, reactions, and everyday chemistry.
- 2. Introduce basic lab safety, equipment handling, and simple experiments (e.g., acid-base indicators, separation techniques).
- 3. Use games, models, and demonstrations to make abstract concepts like atoms, bonding, and states of matter accessible.
- 4. Encourage cadets to relate chemistry to daily life—food chemistry, cleaning agents, fuels, etc.





Grade 10 (Contributor)

- 1. Strengthen understanding of core chemistry concepts through hands-on activities.
- 2. Conduct practicals aligned with O Level Chemistry, such as:
- 3. Qualitative analysis (tests for gases and ions),
- 4. Simple titrations,
- 5. Rates of reaction experiments,
- 6. Electrolysis demonstrations.
- 7. Develop skills in planning, data recording, drawing conclusions, and error analysis.
- 8. Promote creativity and teamwork through model-making (e.g., molecular geometry) and student-led experiments.





Grade 11–12 (Associate and Mentors)

- 1. Train cadets in A Level Chemistry practicals, including:
- 2. Redox titrations,
- 3. Organic synthesis and purification,
- 4. Chromatography,
- 5. Thermochemistry, and kinetics.
- 6. Enhance skills in accurate measurements, chemical handling, and data interpretation.
- 7. Encourage individual and group research projects on advanced chemistry topics (e.g., green chemistry, nanomaterials, environmental chemistry).
- 8. Involve cadets in mentoring juniors, organizing lab demonstrations, and leading club initiatives.
- 9. Connect with national and international chemistry competitions (like IChO) and promote careers in chemistry, chemical engineering, medicine, and STEAM fields.

Q Did You Know?

Chemistry Is in Your Brain Too!

Did you know the feeling of happiness is a chemical reaction? When you laugh or enjoy something, your brain releases dopamine, a chemical messenger that makes you feel good. So technically, chemistry makes you happy!







Resources



1. ACS ChemClub Program

Offers engaging activities, experiments, and community-building ideas for middle and high scho<mark>ol stude</mark>nts.

Link: AACT

- 2. Creative Chemistry
- Provides fun activities, molecular models, and revision quizzes suitable for early learners.

Link: https://www.creative-chemistry.org.uk/

For Grade 10

Chemistry.Com.Pk – Lab Worksheets

- Offers practical worksheets aligned with O Level Chemistry, including qualitative analysis and titration experiments.
- 2. AACT Classroom Resources
 - A vast library of over 1,100 resources, including lesson plans, labs, and demos for K-12 chemistry education.
 - AACT+1AACT+1

For Grade 11-12

Chemistry.Com.Pk – Free Chemistry Books

- Access to a wide range of downloadable chemistry books covering topics like organic synthesis, thermochemistry, and kinetics.
- Chemistry.Com.Pk
- 2. Mr. Ku's Classroom AP Chemistry Resources
 - Provides advanced-level materials, including lab guides and teaching links suitable for A Level students.
 - mr-ku.com







CHEMISTRY CLUB PROJECTS

Year 2023-24

Quantum Dots

Previous year's main project which has been nominated is the use and appearance of quantum dots





Micro Rocket

This is a project that anyone interested in rockets, tinkering, or making can have fun doing this project.

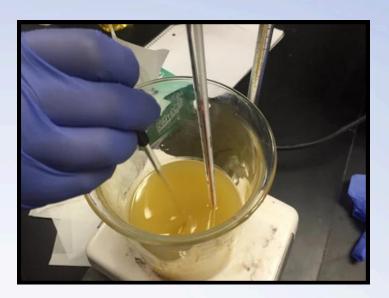
THIS ROCKET REQUIRED OXYGEN GAS AND HYDROGEN GAS AND A SPARK TO SHOW ITS POTENTIAL.





Olive Oil Soap

Making soap is an extremely calculated process. Making soap involves a chemical decomposition of fats and oils into their constituent parts, namely: fatty acids and glycerol. The fatty acids combine with an alkali, usually caustic soda, and the glycerol remains free.



For the Year 2024-25

Theme: Chemistry in Action – Fueling the Future

his year, the Chemistry Club took the lead in promoting scientific curiosity and handson learning through a series of exciting and educational experiments, all centered around the theme "Chemistry in Action – Fueling the Future."

Biodiesel Production from Algae

One of the most ambitious and impactful projects undertaken by the club this year was the successful production of biodiesel from freshwater algae. This experiment not only demonstrated the principles of organic chemistry and transesterification but also addressed real-world concerns surrounding environmental sustainability and renewable energy.





Under careful supervision, cadets cultivated algae in controlled lab conditions, harvested the biomass, and extracted oil using environmentally safe methods. This oil was then chemically converted into biodiesel using a base-catalyzed transesterification process involving methanol and sodium hydroxide. The final product was tested and observed to burn cleanly, illustrating its potential as a sustainable alternative to fossil fuels.





This project offered cadets a rare opportunity to connect theoretical knowledge with practical application, reinforcing concepts in organic chemistry, green energy, and environmental responsibility. It also sparked meaningful discussions about energy crises, climate change, and the role of scientists in shaping a cleaner, more sustainable future.

Q Did You Know?

Chemistry is the only science where something invisible (atoms) can explain everything visible around you—from the fizz in your soft drink to the way fire burns! It's not just about formulas and reactions—it's the science of transformation, curiosity, and creation. Every experiment is a chance to discover a hidden story of matter and energy.







AFFILATIONS OF CHEMISTRY CLUB-CCH

The Salters' Chemistry Club used to be a handbook created for teachers to develop and grow science clubs in

schools. It has now evolved into an online platform that reaches an international audience. Chemistry Club aims to demystify chemistry and showcase the breadth and depth of the subject and the wide range of careers chemistry can lead to. Learners explore chemistry in our everyday lives and see that being a chemist isn't all about wearing a white coat in a lab.

The Duke of Edinburgh's International Award is a global framework for non-formal education and learning, which challenges young people to dream big, celebrate their achievements and make a difference in their world. Through developing transferable skills, increasing their fitness levels, cultivating a sense of adventure and volunteering in their community, the Award helps young people to find their purpose, passion and place in the world.



A fundamental principle of Round Square is that, wherever possible, activities and initiatives are student-led. With this in mind, Round Square Student Committees are encouraged and empowered to initiate and lead campaigns and programmes that make a positive difference to themselves

and others, both in their school environment and out in the wider world. Along the way they build character, courage and compassion in sometimes life-defining ways.



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CHEMISTRY OLYMPIADS AT NATIONAL LEVEL

- National Chemistry Talent Contest (NCTC) is one of the contests of National Science Talent Contest (NSTC). NSTC is held every year under the umbrella of 'STEM Careers Programme' which is a joint venture of 'Pakistan Institute of Engineering and Applied Sciences (PIEAS)' and 'Higher Education Commission (HEC)'. You can represent your country Pakistan in International Chemistry Olympiad (IChO) through this contest.
- National Science Olympiad is Pakistan's science contest that invites students of Grades 4 – 12 & Bachelor-Master to exhibit their attained knowledge and skills at science at a neutral platform. This program is organized by Great Future Pakistan.

CHEMISTRY OLYMPIADS AT INTERNATIONAL LEVEL

• U.S. National Chemistry Olympiad (USNCO) is considered one of the most prestigious chemistry competitions in the US. It invites 1000+ students every year and assesses students on their knowledge of broad chemistry topics, chemical theories, and models, as well as students' problem-solving skills in the lab. The competition is spread across 4 tiers, with students first appearing for local/regional-level rounds, and moving up to the National Level, as well as the International Level. Before the latter, the top 20 finalists from the National Round are invited to Study Camp, where finalists are prepared and tested, right before representing the country at an international level at the International Chemistry Olympiad, or IChO.

Conclusion

In conclusion, the Chemistry Club of Cadet College Hasanabdal is dedicated to providing an engaging and enriching experience to its members. Through its comprehensive five-year plan, the club aims to encourage students to explore the fascinating world of chemistry, while developing their research, leadership, and communication skills. The club also provides opportunities for service to the community, visiting chemical industries, and coordinating with universities and colleges to broaden students' horizons. By attending regular club meetings and participating in various activities, members have the opportunity to connect with one another, share their knowledge and experiences, and learn from one another. Overall, the Chemistry Club aims to provide its members with a well-organized and engaging learning experience, helping them to develop a deeper understanding of chemistry and its applications.





CHEMISTRY CLUB-CCH

Igniting Curiosity, Fostering Discovery

Unlocking the Wonders of Chemistry

Dive into the world of molecules, reactions, and discoveries with Chemistry Club, Cadet College Hasanabdal. As a community of passionate chemists, we explore the mysteries of the molecular realm, turning elements into excitement and reactions into revelations.

What Awaits You:

In-depth Experiments: Immerse yourself in hands-on experiments that bring theories to life.

Educational Insights: Gain valuable knowledge from expert insights and tips shared by OIC.

Community Collaborations: Connect with like-minded inviduals who share your passion for the molecular world.

- Upcoming Events: Stay updated on exciting events, workshops, and lectures that will expand your chemical horizons.

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