CAREERS IN CHEMISTRY

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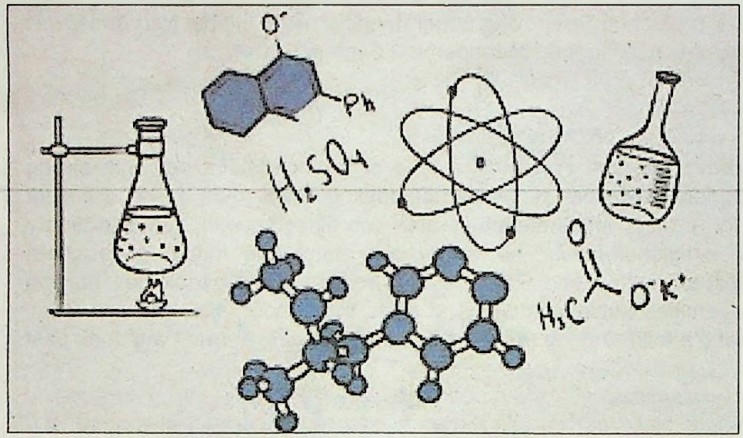
Chemistry is one of the most important fundamental sciences. It is the study of matter, its properties, how and why substances combine or separate to form other substances, and how substances interact with energy. Chemistry tries to decode the details of Chemical molecules and their component atoms.

The research and development in the field of chemistry has given us everything from soaps, cosmetics to medicines. The field of chemistry basically studies the substances and how these substances react with each other. Chemistry is a discipline which studies elements and compounds, atoms, molecules and ions, their composition, structure, properties, behaviour and the changes they undergo during a reaction with other substances. Chemistry professionals may also enter into other branches related to this field. A career in chemistry is definitely the good way to contribute positively to this world through your work.



Chemistry in everyday life

Chemistry is a part of our everyday life. We start the day with Chemistry. One can find chemistry in daily life in the foods we eat, the air we breathe, chemicals we use in cleaning, our emotions and literally every object we see or touch. Our body is made up of chemical compounds, which are combinations of elements. The emotions that one feels are a result of chemical messengers, primarily neurotransmitters. Love, jealousy, envy, infatuation and other emotions have a link with chemistry. As soon as we cut an onion, the tears begin to emerge. What is it in an onion that makes it burn our eyes? Soap is a chemical that mankind has been making for a very long time. Can you imagine how different the world around you would be if ice sank? Chemistry holds the explanation for why ice floats, while most substances sink when they freeze. Sunscreen uses chemistry to filter or block the sun's harmful ultraviolet rays to protect from a sunburn, skin cancer, or both. Do you know how sunscreen works or what an SPF rating really means? Can bottled water go bad? You can apply chemistry to decide when and where to use household chemicals. Food goes bad because of chemical reactions that occur between food molecules. Fats can become rancid. Certain bacterial growth can make one sick. What about products that don't contain fat? The answers to many such questions lie in the study of Chemistry. Chemistry is indeed a part and parcel of our everyday life. A human being himself or herself is a big bag of chemicals!

Employment outlook

Industrial growth has led to a great demand for trained chemists and this trend is expected to continue. Opportunities for students in Chemistry exists in industries manufacturing textiles, petroleum products, rubber, plastics, agricultural products, papers and pulp, metal, cement and aerospace industries, pharmaceutical, food, fertilizers, paints and even in cosmetic and other aromatic product manufacturing industries. Food chemistry and technology incorporates the work chemists do in food flavoring, pet foods, food preservatives. These are

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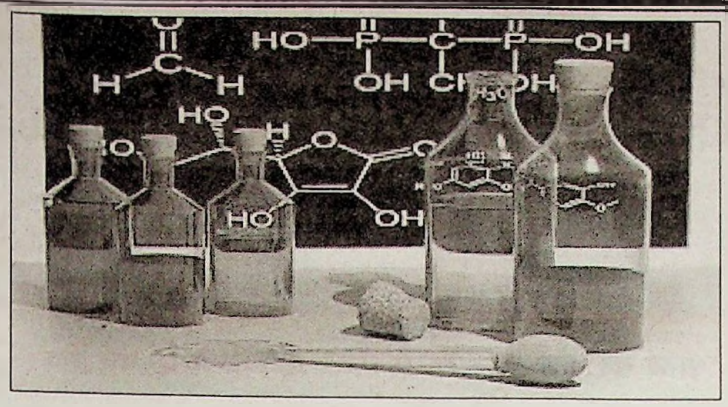
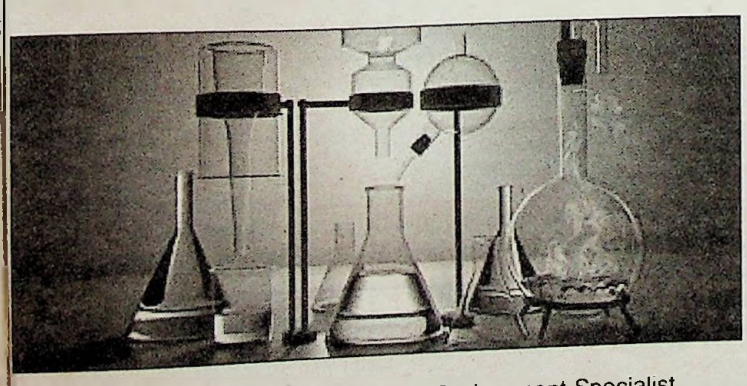
developing areas for research and production. Opportunities for students of chemistry also exist with the government in research laboratories. Civil services is an option for those who prefer not to be in a scientific profession but in administration. Agricultural chemists research for better and improved crop cultivation, developing fertilizers and agricultural chemicals. Other fields offering opportunities are molecular biology, bio-technology, and polymer chemistry. Those with a PhD work in research labs. Chemical scientists with interests in the environment find opportunity for work in the water treatment, sanitary and sewage treatment plants. The packaging and processed foods industry offers viable options. In health care too Chemistry graduates are opting for Medical Laboratory Technology as well as in sales of pharmaceutics. Those who have commercial interest may opt for a management course after graduating with Chemistry to find suitable employment in the management cadres of industries marketing goods such as paints, fertilizers, pesticides etc. Army recruits women candidates for the Army Service Corps as Food scientists. Candidates are required to have a post graduate degree in organic chemistry/Biochemistry of foods. Graduates in Chemistry are enrolled for the Army ordinance corps. Chemists and Chemical Engineers are employed in consultancy firms to provide specialists guidance in areas related to their research specialty. Chemistry researchers work in museums in art conservation and restoration, carbon 14 dating, and in analyzing the genuineness of artifacts through chemical procedures of analysis. Forensic chemists work in forensic labs for crime detection. Toxicologists are





chemists studying the harmful influence of chemicals on biological systems.

Some important recruiting sectors

- Government research laboratories
- Paint manufacturing firms
- Fertiliser companies
- Food industry
- Aerospace industry
- Cement industry
- Packaging industry
- Forensic labs
- Consultancy firms
- Pharmaceutical firms and pesticide companies
- Textile manufacturers etc.
- Pharmaceutical Companies
- Agrochemical Industry
- Petrochemical Industry
- Toiletry Industry
- Plastic Manufacturing Units
- Chemical Manufacturers
- Paint Manufacturing Companies
- Plastic Industries
- Educational Institutes
- Independent laboratories
- Environmental Law
- Patent law firms
- Space Exploration Agencies
- Forensic Science Department
- Ceramics Industry
- Paper Industry
- Cosmetic Chemists

A career in chemistry is full of diverse and challenging opportunities. It is an exciting and promising field to work for. The most popular career option for chemistry graduates is research. Public research institutes and government also give many opportunities to chemists. You are supposed to work as scientist or scientific adviser on many government health and industrial projects.

Scope as a Professional

- Teacher- School to Research institutions
- Lab Chemist
- Analytical Chemist
- Research & Development Director
- Production Chemist
- R & D Manager
- Biomedical Chemist
- Quality Controller
- Production Officer
- Materials Technologist
- Chemical Engineering Associate
- Industrial Research Scientist
- Safety Health and Environment Specialist
- Biotechnologist
- Healthcare Scientist
- Forensic Scientist
- Nanotechnologist
- Pharmacologist
- Research Scientist (Physical Sciences)
- Scientific Laboratory Technician
- Toxicologist
- Civil service fast streamer
- Environmental Consultant
- Management Consultant
- Nuclear Engineer
- Patent Attorney
- Science Writer
- Geochemist
- Hazardous Waste Chemist
- Materials Scientist
- Medical technologist
- Crime lab analyst
- Colour development specialist
- Pest control technician
- Lab coordinator
- Pollution controller
- Chemical safety officer
- Technical writer
- Technical sales representative

Pharmacologist: Pharmacologists undertake the development and testing of drugs, analysing how they interact with biological systems. This is essential for ensuring that drugs are effective and safe for human use, and may involve the testing of drugs on animals or on human volunteers. Pharmacology roles are often lab-based and may involve non-standard hours in order to monitor ongoing experiments.

Toxicologist: Toxicologists may study the effects of drugs on biological systems but also look at the effects of other substances, both natural and man-made. They work with and develop methodologies for determining harmful effects of substances, as well as how to judge correct dosages and therefore avoid them. As with pharmacology, toxicology roles are often lab-based and involve the monitoring of experiments and interpretation of results.

Water Chemist: Water chemists, as the name suggests, are concerned with analysing and maintaining the quality and condition of water, essential for human life on Earth. This is a highly interdisciplinary field, so as well as chemistry you may also need knowledge of linked fields such as microbiology and geology. You may find similar roles under a variety of names, for example hydrologist or hydrogeologist.

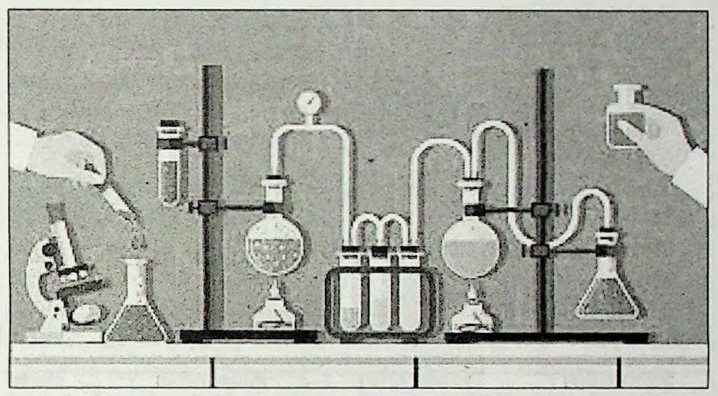
Analytical Chemist: Analytical chemists use their skills and expertise to analyse substances, identify what components are present and in what quantities, as well how these components may behave and react with one another. This can include the analysis of drugs, food and other products to determine effectiveness, quality and to ensure they are safe for human consumption or use.

Forensic Scientist: Forensic scientists search for and analyse forensic materials found at crime scenes, for example blood and other bodily fluids, hair, or non-biological substances such as paint. They are then able to present this evidence for use in legal investigations and courts of law. Forensic scientists may sometimes be called in to speak in court as experts in their field, to explain the evidence to the jury.

Hazardous Waste Chemist: Hazardous waste chemists deal with the management and safe relocation of hazardous materials (hence the common abbreviation "hazmat"). They use their expertise to identify harmful chemical components in the air, water or soil, evaluate the danger they present and coordinate their removal and containment.

Geochemist: Geochemists study the physical and chemical properties of the Earth, particularly rocks and minerals. They use their knowledge to determine the make-up and distribution of rock and mineral components, and how these may affect the soil and water systems in which they are found. Geochemists may help to identify oil drill sites, improve water quality or determine how best to remove hazardous waste.

Chemical Engineer: Chemical engineers are involved in design and development of new products from raw materials. They use their knowledge of chemical properties and reactions to transform materials from one state to another, for example making plastic from oil. Chemical engineers may work in almost any industry, assisting in the production of innovative, high-end products such as ultra-strong fabrics or biocompatible implants.



Materials Scientist: Materials scientists study man-made and natural substances to determine their properties, composition and how they could be transformed or combined to increase effectiveness or create new materials. By analysing and experimenting with existing materials, materials scientists are able to enhance the way they are used and create new materials to better serve humanity's needs.

Organic Chemists work with organic carbon compounds and specialize in petroleum, dyes, rubber, alcohol, oils, natural fats, organic acids, pesticides, organic compounds and their polymerization and precipitate products which include plastics and soaps.

Inorganic Chemists work relates to metals, acids, salts and gases. Specialization is in production of acids, salts, minerals, metals etc.

Physical Chemists work with metals, ores, gases, and different chemical elements and compounds to ascertain their physical and chemical properties, radioactivity, structures, atomic and molecular weights etc. Specialized work is in the area of electrochemistry, thermodynamics, chromatography etc.

Remuneration

In the age of global revolution Chemist is a well-paid job. A person, who desires to pursue a career in this field, can expect a salary between 20000-55000 per month in the beginning. However salaries of chemistry professionals vary depending upon their individual qualifications, experience, size and nature of the hiring institutes. Persons with a superior record and high qualifications can achieve high positions. The salaries in college and university departments are comparable to those of teachers. Indeed, the salaries of special professionals are high. Chems Professionals working in research institutes and private research centers also have handsome earnings. Many companies are willing to pay handsome salaries to new chemists.

Different Courses in Chemistry after 12th

- B. Com. - Actuarial Science
- Bachelor of Science
- B. Sc.- Analytical Methods in Chemistry & Bio-Chemistry
- B. Sc. - Applied Chemistry
- B. Sc. - Hons. Chemistry
- Bachelor of Science + Masters of Science in Chemistry
- M. Sc. - Industrial Chemistry
- M. Sc. - Analytical Chemistry
- M. Sc. - Chemistry
- M. Sc. - Drug Chemistry
- M. Sc. - Organic Pharmaceutical Chemistry
- M. Sc. - Physical & Materials Chemistry
- M. Sc. - Electro Chemistry
- P.G. Diploma courses
- M.Phil - Geo-engineering
- Ph. D. - Ion exchange, Material Science & Polymer Composites and many.

In our country 100 plus institutes including government laboratories, universities and other professional institutions offer bachelor, master and doctorate degree in chemistry. For admission to B.Sc. general or honour's, 10+2 with science is required. For masters degree, a bachelor degree with chemistry as one of the subject is required with minimum 50% marks and for Ph.D. there is requirement of at least 55% marks in master degree. However, the rules for admission to bachelor, masters and research degree vary from university to university/institute.

Many universities/institutes are offering courses in different

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