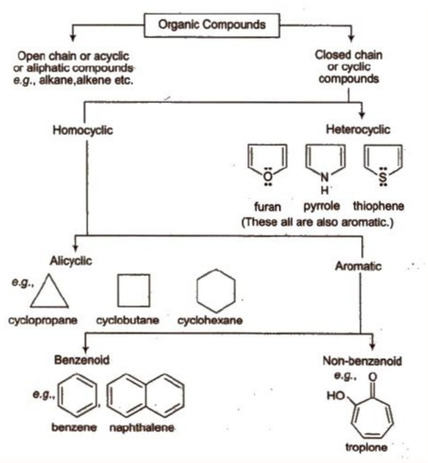
Grade 11 cbse chemistry textbook pdf



the molecules in the bulk, which do not experience any net force. Therefore, liquids tend to have minimum number of molecules at their surface. If surface of the liquid is increased by pulling a molecule from the bulk, attractive forces will have to be overcome. This will require expenditure of energy. The energy required to increase the surface area of the liquid by one unit is defined as surface energy. Its dimensions are J m^{-2}. Surface tension is defined as the force acting per unit length perpendicular to the line drawn on the surface of liquid. It is denoted by Greek letter γ (Gamma). It has dimensions of kg s^{-2} and in SI unit it is expressed as N m^{-1}. The lowest energy state of the liquid will be when surface area is minimum. Spherical shape satisfies this condition, that is why mercury drops are spherical in shape. This is the reason that sharp glass edges are heated for making them smooth. On heating, the glass melts and the surface of the liquid tends to take the rounded shape at the edges, which makes the edges smooth. This is called fire polishing of glass.

Liquid tends to rise (or fall) in the capillary because of surface tension. Liquids wet the things because they spread across their surfaces as thin film. Moist soil grains are pulled together because surface area of thin film of water is reduced. It is surface tension which gives stretching property to the surface of a liquid. On flat surface, droplets are slightly flattened by the effect of gravity; but in the gravity free environments drops are perfectly spherical.

The magnitude of surface tension of a liquid depends on the attractive forces between the molecules. When the attractive forces are large, the surface tension is large. Increase in temperature increases the kinetic energy of the molecules and effectiveness of intermolecular attraction decreases, so surface tension decreases as the temperature is raised.

5.11.3 Viscosity

It is one of the characteristic properties of liquids. Viscosity is a measure of resistance to flow which arises due to the internal friction between layers of fluid as they slip past one another while liquid flows. Strong intermolecular forces between molecules hold them together and resist movement of layers past one another.

When a liquid flows over a fixed surface, the layer of molecules in the immediate contact of surface is stationary. The velocity of upper layers increases as the distance of layers from the fixed layer increases. This type of flow in which there is a regular gradation of velocity in passing from one layer to the next is called **laminar flow**. If we choose any layer in the flowing liquid (Fig.5.16), the layer above it accelerates its flow and the layer below this

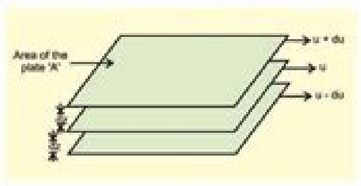


Fig. 5.16 *Gradation of velocity in the laminar flow*

retards its flow.

If the velocity of the layer at a distance dz is changed by a value du then velocity gradient is given by the amount . $\frac{du}{dz}$ A force is required to maintain the flow of layers. This force is proportional to the area of contact of layers and velocity gradient i.e.

$F \propto A$ (A is the area of contact)

$F \propto A.\frac{du}{dz}$ (where, $\frac{du}{dz}$ is velocity gradient; the change in velocity with distance)

$$F \propto A.\frac{du}{dz}$$

$$\Rightarrow F = \eta A\frac{du}{dz}$$

(b) (i) XeF_2, (ii) $H_4P_2O_7$ की संरचना खींचिए । 5

अथवा

(a) फ्लुओरीन की असामान्य अभिक्रिया दर्शाने के लिए एक उदाहरण दीजिए ।

(b) श्वेत फ़ॉस्फ़ोरस और लाल फ़ॉस्फ़ोरस के बीच एक संरचनात्मक अन्तर क्या है ?

(c) क्या होता है जब XeF_6, NaF से अभिक्रिया करता है ?

(d) H_2O की अपेक्षा H_2S एक बेहतर अपचायक क्यों है ?

(e) निम्नलिखित अम्लों को उनके अम्लीय लक्षण के बढ़ते हुए क्रम में व्यवस्थित कीजिए :

HF, HCl, HBr और HI 5

(a) Account for the following :

(i) Tendency to show −3 oxidation state decreases from N to Bi in group 15.

(ii) Acidic character increases from H_2O to H_2Te.

(iii) F_2 is more reactive than ClF_3, whereas ClF_3 is more reactive than Cl_2.

(b) Draw the structure of (i) XeF_2, (ii) $H_4P_2O_7$.

OR

(a) Give one example to show the anomalous reaction of fluorine.

(b) What is the structural difference between white phosphorus and red phosphorus ?

(c) What happens when XeF_6 reacts with NaF ?

(d) Why is H_2S a better reducing agent than H_2O ?

(e) Arrange the following acids in the increasing order of their acidic character :

HF, HCl, HBr and HI

UNIT 1

SOME BASIC CONCEPTS OF CHEMISTRY

Objectives

After studying this unit, you will be able to

- appreciate the contribution of India in the development of chemistry understand the role of chemistry in different spheres of life;
- explain the characteristics of three states of matter;
- classify different substances into elements, compounds and mixtures;
- use scientific notations and determine significant figures;
- differentiate between precision and accuracy;
- define SI base units and convert physical quantities from one system of units to another;
- explain various laws of chemical combination;
- appreciate significance of atomic mass, average atomic mass, molecular mass and formula mass;
- describe the terms - mole and molar mass;
- calculate the mass per cent of component elements constituting a compound;
- determine empirical formula and molecular formula for a compound from the given experimental data; and
- perform the stoichiometric calculations.

Chemistry is the science of molecules and their transformations. It is the science not so much of the one hundred elements but of the infinite variety of molecules that may be built from them.

Roald Hoffmann

Science can be viewed as a continuing human effort to systematise knowledge for describing and understanding nature. You have learnt in your previous classes that we come across diverse substances present in nature and changes in them in daily life. Curd formation from milk, formation of vinegar from sugarcane juice on keeping for prolonged time and rusting of iron are some of the examples of changes which we come across many times. For the sake of convenience, science is sub-divided into various disciplines: chemistry, physics, biology, geology, etc. The branch of science that studies the preparation, properties, structure and reactions of material substances is called chemistry.

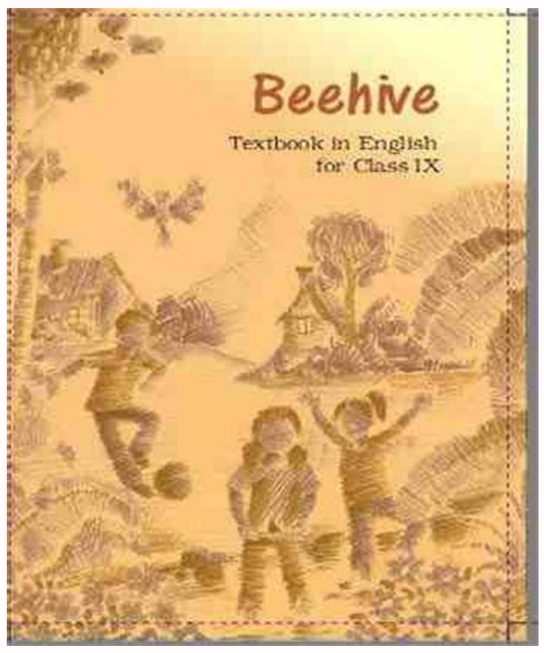
DEVELOPMENT OF CHEMISTRY

Chemistry, as we understand it today, is not a very old discipline. Chemistry was not studied for its own sake, rather it came up as a result of search for two interesting things:

i. *Philosopher's stone (Parasi* which would convert all baser metals e.g., iron and copper into gold.

ii. *'Elexir of life'* which would grant immortality.

People in ancient India, already had the knowledge of many scientific phenomenon much before the advent of modern science. They applied that knowledge in various walks of life. Chemistry developed mainly in the form of Alchemy and Iatrochemistry during 1300-1600 CE. Modern chemistry took shape in the 18th century Europe, after a few centuries of alchemical traditions which were introduced in Europe by the Arabs.



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Class 11 Chemistry NCERT Solutions NCERT solutions for class 11 chemistry has all the solutions to the questions given in the textbook. The solutions available are in depth and in the simplest way possible. Thus, this chemistry class 11 NCERT solutions ensures that the students have the utmost understanding of the topic. This will help the students beyond examination marks. This will help them develop a core understanding of the subject. Because this subject demands to understand rather than just memorizing solutions of class 11 chemistry. Here below we are providing you with the overview of all the chemistry class 11 chapters that are there in the NCERT textbook. Chapter 1 Some Basics Concepts of Chemistry This class 11 Chemistry NCERT chapter 1 explains the role that is played in everyday life by chemistry. Furthermore, this chapter will explain the laws of chemical combinations and the nature of the matter. In this chemistry class 11 chapter 1, students will go in details about Dalton's atomic theory where the concepts of molecules and atoms are explained. Also, class 11 chemistry chapter 1 deals with the molecular masses and concepts of atomic masses. Move to Top of the page. Chapter 2 Structure of Atoms This Chemistry ncert class 11 chapter 2 will be fundamental for atoms and thus students will get to know about the discovery of proton, electron, and neutrons. They will also study what isotopes, isobars, atomic numbers, etc is. This chapter also describes details of Thomson's model along with its limitations. Besides this, it talks about Bohr's model and Rutherford's model and its limitations. There is some detail being thrown into the dual nature of light and matter, Heisenberg's uncertainty principle, de Broglie's principle, the shapes of s, d, and p orbitals, quantum numbers, etc. There are also topics like Hund's rule and Pauli's exclusion principle which are also discussed in this chapter. Chapter 3 Periodicity in Properties and Classification of Elements In this chapter, you will learn about a brief history of the periodic table and its development, the significance of classifying periodic table, how the present form of the periodic table was formed, etc. Furthermore, the information about the trends in the periodic table for atoms like ionic radii, radii, inert gas radii, electronegativity, electron gain, valency, etc. is more discussed in this chapter. A total of 40 questions are there in CBSE Class 11 Chemistry NCERT Solutions for students to practice. Move to Top of the page. Chapter 4 Chemical Bonding and Molecular Structure This NCERT Chemistry class 11 chapter 4 will help you understand what a covalent bond and an ionic bond is. There are more details about the parameters of the bonds, covalent bond and it's the polar character, the bond theory of valence, covalent bond and it's geometry, resonance, etc. Furthermore, this chapter discusses the VSEPR theory, concepts of hybridization that involve s, d, and p orbitals, various shapes of some molecules, and many more. There are a total of 40 questions in this chapter that can help students to practice. Chapter 5 States of Matter – Liquid and Gas This chapter will make students understand about three states of matter along with the types of bonding and intermolecular interactions. There are also some insights about the boiling point and melting points given in the chapter. Furthermore, the roles of gas laws are discussed and how Gay lussac's law, Boyle's law, Avogadro's law, etc are helping students understand their ideal behavior. Along with this, the Avogadro's number, empirical deviation in the gas equation, and the ideal equation required for the numerical are illustrated. Chapter 6 Chemical Thermodynamics This chemistry class 11 chapter 6 helps with the concepts of various systems and their different types. There is also discussion provided about the surroundings in the form of heat, work, energy, intensive and extensive properties, and state functions. There is a discussion about the first law of thermodynamics in this chapter. It involves the enthalpy and internal energy, specific heat, heat capacity, measurement of heat, etc. Chapter 7 Equilibrium This chemistry NCERT Solutions class 11 chapter 7 talks about the concepts of equilibrium in chemical and physical processes and details related to the equilibrium's dynamic nature. There are also some insights related to the law of mass action, the factors affecting equilibrium and the equilibrium constant as per Le Chatelier's principle. Furthermore, the information about the acid strength, ionization of polybasic acids, Henderson equation, the concept of pH, etc are also discussed. Chapter 8 Redox Reaction This chapter will provide in-depth knowledge to students about the reduction and oxidation and various insights about the redox reactions. Furthermore, information about balancing the redox reactions, oxidation number, etc will also be provided. There are a total of thirty questions in the chapter that also discusses the loss and gains of electrons. Chapter 9 Hydrogen Through this chapter, you will learn about the occurrence of hydrogen and it's position in the periodic table. Along with this, there will be some information about the isotopes, their properties and how they are prepared is also discussed in this chapter. Information related to interstitial and hydrogen ionic covalent bonds is also discussed in this chapter. Chapter 10 S-block Elements This chapter discusses the elements present in group 1 and 2. It discusses the electronic configuration along with their occurrence. Every first element in the group shows some anomalous behavior which is also discussed in this chapter. There are diagonal relationships like atomic radii, variation in terms of properties in ionization enthalpy, ionic radii, etc is also discussed. How some of the important compounds like sodium chloride, sodium carbonate, sodium hydrogen carbonate, and sodium hydroxide are prepared is also discussed in this chapter. Chapter 11 Some P-block Elements This chapter provides more of a general view of the p-block elements to the students. There is also in-depth and detailed information about the elements in group 13 being discussed in this chapter. Also, the variation of oxidation states and their properties is also discussed. The chemical and physical properties of boron along with its important compounds like boric acid, borax, boron hydrides, etc are discussed in this chapter. Chapter 12 Organic Chemistry – Some Basic Techniques and Principles This chapter talks more about various purification methods along with quantitative and qualitative analysis being used for it. Furthermore, information related to IUPAC nomenclature and classification of various organic compounds is also discussed in this chapter. Along with this, the electronic displacements occurring in a covalent bond in the form of electromeric effect, inductive effect, hyperconjugation, resonance are also discussed in-depth. Chapter 13 Hydrocarbons In this NCERT class 11 chemistry chapter 13, students will get to know in detail about the classification of hydrocarbons and their uses, properties, and related reactions. Furthermore, this chapter talks about alkanes, alkynes, and alkenes. It also talks about related nomenclature, physical properties, IUPAC names, chemical reactions, combustion, isomerism, etc. Chapter 14 Environmental Chemistry This chapter 14 Environmental Chemistry will talk about the environmental part of chemistry like environmental pollution related to air, soil, and water. Furthermore, all the chemical reactions happening in the atmosphere due to smog, major atmospheric pollutants, etc is also discussed. This final chapter in NCERT solutions for class 11 chemistry further discusses about ozone, acid rains and it's reactions. A total of 20 questions will help students understand various alternative tools required for reducing pollution. NCERT solutions for class 11 chemistry is the right recipe for students who want to go beyond marks in the exams. We will keep you updated on all exam related stuff on this website. More Resources for CBSE Class 11 NCERT Solutions CBSE Chemistry Practical Class 11 Lab Manual

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