

This article provides you the revision notes on Class 11 Chemistry: Chapter- Some Basic Concepts of Chemistry, to give you a quick glance of the chapter. These quick notes are prepared strictly according to the latest CBSE syllabus for Class 11 Chemistry and are sure to help you while preparing for the exams. This article provides you the revision notes on Class 11 Chemistry: Chapter- Some Basic Concepts of Chemistry, to give you a quick glance of the chapter. In between the various topics. These question will help you check your preparedness and clear your doubts. These quick notes are prepared strictly according to the latest CBSE syllabus for Class 11th Chemistry. CBSE Class 11 Chemistry Syllabus 2017 – 2018 Topics covered in this part of Chapter notes for 'Some Basic Concepts of Chemistry', are: • Matter o Definition o Classification o Properties • Basic physical quantities, their SI units and measurements • Uncertainties in Measurement The key notes of the chapter are as follows: Introduction: Chemistry is the branch of science that deals with the composition, structure and properties of matter. Matter Anything which has mass and occupies space is known as matter. For example: Air, water, table, pencil, etc. Matter can exist in three physical states viz. solid, 1. Homogeneous mixture: Uniform composition of constituent particles. 2. Heterogeneous mixture: Nonuniform composition of constituent particles. Elements: Simplest form of pure substance, which can liquid and gas. Classification of Matter: On the basis of chemical composition of various substances matter can be classified as follows: neither be decomposed into nor built from simpler substances by ordinary physical and chemical methods. Contains only one kind of atoms. For example: Hydrogen, Oxyen, Nitrogen, etc. Compounds: A form of matter formed by suitable chemical methods For example: H2O, O2, NO2, etc. Properties of Matter and Their Measurement Properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties of matter can be classified into two categories: Physical properties: Physical properties Prefixes used in the SI System: melting point, boiling point, density etc. Chemical properties: These are the properties which can be measured by bringing a chemical change in the state or identity of a substance. For example: Acidity, basicity, combustibility etc. Basic physical quantities and their SI units: CBSE Class 11 Biology Syllabus 2017 - 2018 Mass: It is the amount of matter present in a substance. It is a constant quantity. Its SI unit is kilogram (Kg). Weight: It is the volume of space occupied by a substance. Its SI unit is cubic metre (m)3. Another common unit is litre (L). 1 Cubic Meter = 1000 Liters (1 m3 = 1000L) 1 L = 1000 mL, 1000 cm3 = 1 dm3 Density: It is the amount of mass per unit volume. Its SI unit is kilogram per cubic meter (q/cm3). Temperature: It is the degree of heat present in a substance. Its SI unit is Kelvin (K) Another common units are: Degree Celsius (°C) and degree Fahrenheit (°F) Check your preparedness by solving the following questions: 1. What should be the volume of milk in cubic metre (m3) if it measures 4 L? (a) 4 × 103 m3 (b)  $4 \times 106 \text{ m}3$  (c)  $4 \times 10-3 \text{ m}3$ (d)  $4 \times 1000 \text{ m}3 2$ . Which (b)  $4.73 \times 10-4$  g (c) 4730 ng (d)  $4.73 \times 103$  kg 3. What is the value of temperature 750 F on the Kelvin scale? (a) 2015 K measurement represents the smallest quantity among the following: (a) 47.3 mg (b) 215 K (c) 297 K (d) 348 K Uncertainties in Measurement Scientific Notation Numbers are represented in N  $\times$  10n form. Where, N = Digit term n = exponent having positive or negative value. Examples, 12540000 = 1.254  $\times$  107 0.00456 = 4.56  $\times$ 10-3 Precision. It refers to the agreement of a particular value to the true value of the result. Significant Figures To express a measurement accurately, it must be represented by the digits that are known with certainty. These are called as Significant figures. CBSE Class 11 Physics Syllabus 2017 - 2018 Rules for determining the significant figures. Zeroes preceding the first non-zero digit are not significant. For example, 0.004 has one significant figures. Zeroes at the end of a number are significant when they are on the right side of the decimal point. For example, 14.0 has three significant figures. Counting numbers of objects have infinite significant figures. Calculations Involving Significant Figures 1. Addition & Subtraction, the final result should be reported to the same number of decimal places as that of the term with the least number of decimal places. For example: 2 Multiplication & Division In multiplication and division, the result should be reported to the same number of significant figures as the term with least number of significant figures. For example: Rounding Off the Numerical Results While limiting the result to the required number of significant figures, the number of significant figures is reduced. For this: The last digit retained is increased by 1, if the following digit is ≥ 5. For example: 25.468 can be written as 489.7 The last digit retained is written as 489.7 The last digit retained is written as such, if the following digit is ≤ 4. For example: 12.93 can be written as 12.9 CBSE Class 11 Mathematics Syllabus 2017 - 2018 Check your preparedness by solving (d)  $2355.08 \times 1002$ . Number of significant figures in 2.005 are: (a) Three the following questions: 1. How to write 235.508 in scientific notation? (a)  $23.5508 \times 102$ (b) 2.35508 × 102 (c) 235.508 × 10 (b) Two (c) Zero (d) Four 3. What would be the answer in appropriate (d) 8.0633 CBSE Class 11 Chemistry Practice Paper, 2017: Set-I CBSE Class 11 Chemistry Solved Practice Paper 2017: Set - II NCERT Notes For Class 11 Chemistry Chapter 1 Some Basics Concepts Of Chemistry, (Chemistry) significant figures to the addition of 3.0223 and 5.041? (a) 80.633 (b) 8.063 (c) 806.33 exam are Students are taught thru NCERT books in some of state board and CBSE Schools. As the chapter involves an end, there is an exercises very well because the guestions withinside the very last asked from those. Sometimes, students get stuck withinside the exercises and are not able to clear up all of the questions. To assist students, solve all of the questions and maintain their studies without a doubt, we have provided step by step NCERT Notes for the students for all classes. These answers will similarly help students in scoring better marks with the assist of properly illustrated Notes as a way to similarly assist the students and answering the questions right. Class 11 Chemistry Chapter 1 Some Basics Concepts Of Chemistry is the branch of Science that deals with the properties, structure and composition of matter. There are a large number of branches for Chemistry. Some of them are:Inorganic ChemistryPhysical Chemistr the physical state we can divide matter into different categories. Solid stateLiquid stateGaseous statePlasma stateBose-Einstein condensateFermionic condensateFermion Potassium (K), Hydrogen (H), Oxygen (O), Helium (He), Carbon dioxide (CO2), water (H2O), ammonia (NH3), cane sugar (C12H22O11) etc. These are further divided into two – elements and compounds. Elements Elements are pure substances which contain only one type of particles. These particles may be atoms or molecules. The term element was first introduced by Robert Boyle, the father of ancient Chemistry Now there are about 117 elements exist as monoatomic, E.g. Hydrogen, Nitrogen, Oxygen (diatomic), Sodium, Potassium, Lithium, Calcium (monoatomic), Phosphorus, Sulphur (polyatomic) etc. CompoundCompounds are pure substances which contain more than one type of atoms.E.g. CO2, H2O, NH3, H2SO4 etc.Mixtures of mixtures are two types of mixtures – homogeneous and heterogeneous and heterogeneous mixtures. Mixtures having uniform composition throughout are called homogeneous mixtures. E.g. all type of solutions, air etc.Mass and WeightMass is the amount of matter present in a body. It is a constant quantity. Its SI unit is kilogram (kg). Weight is the gravitational force acting on a body. It is a variable quantity. i.e. it changes with place. Its SI unit is newton (N). Volume (V) It is the space occupied by a body. Its SI unit is m3. Other units are cm3, mL, L etc. 1 m3 = 106 cm31 cm3 = 1 mL1 L = 103 cm3 (mL)1 dm3 = 103 cm3Density (d)It is the amount of mass per unit volume.i.e. density = mass/volume. Its SI unit is kg/m3. But it is commonly expressed in g/cm3. Temperature (T)It is the degree of hotness or coldness of a body. It is commonly expressed in degree Fahrenheit (0F), Kelvin (K) etc. its SI unit is Kelvin (K). Degree Celsius and degree Fahrenheit are related as: 0F = 9/5(0C) + 32Degreecelsius and Kelvin are related as: K = 0C + 273.15 Precision and Accuracy Precision refers to the closeness of various measurements for the same quantity. But, accuracy is the agreement of a particular value of the result. Significant Figures Every experimental measurement has some amount of uncertainty associated with it. The uncertainty in the experimental or the calculated values is indicated by mentioning the number of significant figures. Significant figures. These are:All non-zero digits are significant. For example in 285 cm, there are three significant figures. Zeros between digit are not significant figures. Zeros between digit are not significant figures. Zeros between digits are significant figures. Z two non-zero digits are significant. Thus, 2.005 has four significant figures. Zeros at the end or right of a number are significant figures. For example, 0.200 g has three significant figures. For example, in 2 balls or 20 eggs, there are infinite significant figures since these are exact numbers and can be represented by writing infinite number of zeros after placing a decimal i.e., 2 = 2.000000 or 20 = 20.000000 when numbers are written in scientific notation, the number of digits between 1 and 10 gives the number of significant figures. For e.g.  $4.01 \times 102$  has three significant figures, and 8.256 × 10-3 has four significant figures. LAWS OF CHEMICAL COMBINATIONSThe combination of elements to form compounds is governed by the following five basic laws: Law of conservation of Mass (Law of indestructibility of matter): This law was proposed by Antoine Lavoisier. It states that matter can neither be Consider the reaction  $2H2 + O2 \rightarrow 2H2OHere 4$  g of H2 combines with 32 g of O2 to form 36 g of created nor destroyed. We can only convert one form of matter into another form. Or, in a chemical reaction, the total mass of reactants is equal to the total mass of products. Chemical equations are balanced according to this law. Illustration water. Total mass of reactants = 4 + 32 = 36gTotal mass of products = 36 gLaw of Definite Proportions (Law of definite compound always contains exactly the same proposed by Joseph Proust. It states that a given compound always contains the same elements combined in a fixed ratio by mass.Illustration: Carbon dioxide can be formed in the atmosphere by various methods like respiration, burning of fuels, reaction of metal carbonates and bicarbonates with acid etc. All these samples of CO2 contain only two elements Carbon and Oxygen combined in a mass ratio 3:8. Law of Multiple Proportions: This law was proposed by John Dalton. It states that if two elements can combine to form more than one compound, the different masses of one of the elements that combines with oxygen to form two compounds – water and hydrogen peroxide. Hydrogen + Oxygen → 16g 18gHydrogen + Oxygen  $\rightarrow$  Hydrogen Peroxide 2g 32g 34gHere, the masses of oxygen (i.e. 16 g and 32 g) which combine with a fixed mass of hydrogen (2g) bear a simple ratio, i.e. 16:32 or 1: 2.Gay Lussac's Law of Gaseous Volumes: This law was proposed by Gay Lussac. It states Water that when gases combine to form gaseous products, their volumes are in simple whole number ratio at constant temperature and pressure. Illustration: H2 combines with O2 to form water vapour according to the equation  $2H2O(g) \rightarrow 2H2O(g)$ . If 100 mL of hydrogen combine with 50 mL of oxygen, we get 100 mL of water vapour. Thus, the volumes of hydrogen and oxygen which combine together (i.e. 100 mL and 50 mL) bear a simple ratio of 2:1. Avogadro's Law: This law was proposed by Amedeo Avogadro. It states that equal volumes of all gases at the same temperature and pressure should contain equal number of moles or molecules. Illustration: If we take 10L each of NH3, N2, O2 and CO2 at the same temperature and pressure, all of them contain the same number of moles and molecules.DALTON'S ATOMIC THEORYThe term atom was first used by John Dalton from the Greek word a-tomio (means indivisible). He proposed the first atomic theory. The important postulates of this theory are: Matter is made up of minute and indivisible particles called atoms. Atoms can neither be created nor be destroyed. Atoms of same element are identical in their properties and mass. Balton's theory could explain the laws of chemical combination. Atoms and Molecules Atom is the smallest particle of a substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of that substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of a substance. A molecule has all the properties of the smallest particle of the smallest parti molecule containing only one type of atom is called homonuclear molecules. e.g. H2, O2, N2, O3 (ozone) etcHeteronuclear molecules contain only one types of molecules – monoatomic, diatomic and polyatomic molecules. Monoatomic molecules contain only one atom. E.g. all metals, noble gases like He, Ne, Ar etc.Diatomic molecules contain 2 atoms. E.g. H2, O2, N2, halogens (F2, Cl2, Br2 and I2)Polyatomic mass of an element is a number that expresses how many times the mass of an atom of the element is greater than 1/12th the mass of a C12 atom. For e.g. atomic mass of a C12 atom. For e.g. atomic mass of a C12 atom. Atomic mass of a C12 atom is called atomic mass unit (amu). i.e. 1 amu = 1/12 x mass of a C12 atom. = 1.66 x10-24 g = 1.66 x 10-27 kgToday, 'amu' has been replaced by 'u' which is known as unified mass. Average atomic mass of an element by considering the atomic mass of the isotopes and their relative abundance. For e.g. chlorine has two isotopes Cl35 and Cl37 in the ratio 3:1. So the average atomic mass of each element by the number of its atoms and adding them together. For e.g. molecular mass of H2SO4 is calculated as:  $2 \times 1 + 1 \times 37$ /4 = 35.5 Molecular mass of the element by the number of its atomic mass of each element by the number of element 32 + 4 x 16 = 98u.Formula mass: In the case of ionic compounds (like NaCl), there is no discrete (separate) molecules. Here the positive ions and the negative ions and the negative ions are arranged in a three-dimensional structure. So we can calculate only formula mass by taking molecular formula of the compound. Mole conceptMole is the unit of amount of substance. It is defined as the amount of substance that contains as many particles as there are atoms in exactly 12 g C12 isotope.mole of any substance constant (NA or N0).1 mol of hydrogen atoms =  $6.022 \times 1023$  atoms. This number is known as Avogadro number or Avogadro constant (NA or N0).1 mol of hydrogen atoms =  $6.022 \times 1023$  atoms. This number is known as Avogadro constant (NA or N0).1 mol of hydrogen atoms =  $6.022 \times 1023$  atoms. This number is known as Avogadro number or Avogadro number or Avogadro constant (NA or N0).1 mol of hydrogen atoms =  $6.022 \times 1023$  atoms. This number is known as Avogadro number or Avogadro numb mol of sodium chloride = 6.022 × 1023 formula units of sodium chlorideMolar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 2g etc. Molar volume: It is the volume of 1 molecular mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 2g etc. Molar mass of oxygen = 2g etc. Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass of oxygen = 32g Molar mass of oxygen = 32g Molar mass in qrams is numerically equal to molecular mass in qrams is numerically equal to molecular mass in qrams is of any substance. At standard temperature and pressure (STP), molar volume of any gas = 22.4 L (or, 22400 mL). i.e. 22.4 L of any gas at STP contains 1 mole of H2 = 6.022 × 1023 molecules of hydrogen = 2 g of H2Percentage compositionIt is the percentage of each elements present in 100g of a substance.i.e. percentage composition, we can calculate the empirical and molecular formula of a compound. Empirical and Molecular formulaeEmpirical formula is the simplest formula which gives only the ratio of different elements present in the compound. But molecular formula is the actual formula is t we can calculate the empirical and molecular formula of a compound. Stoichiometry and Stoichiometry is derived from two greek words - stoicheion (meaning measure). Thus stoichiometry deals with the calculations involving the masses or the volumes of reactants and the products. Chemical EquationIt is the representation of a chemical reaction by symbols and formulae. Here the reactants are written in the left-hand side and the products, on the right hand side. (The substances which are called reactants are written in the left-hand side and the products, on the right hand side.) products). A chemical equation should be balanced and the physical states of reactants and products are written in brackets. The following informations are obtained from a chemical equation. An idea about the number moles and molecules of reactants and products. An idea about the volumes of reactants and products at STP. Limiting reagent (Limiting reagent which is completely consumed in a chemical reactant): The reagent which is completely consumed in a chemical reactant. If we take 10 moles each of SO2 and O2, we get only 10 moles of SO3 because 10 moles of SO2 requires only 5 moles of O2 for the complete reaction. So here SO2 is the limiting reagent and 5 moles of O2 remains unreacted. Reactions in solutions Solutions are homogeneous mixture containing 2 or more components. The components are called solutes.Or, the substance which is dissolved is called solute and the substance in which solute is dissolved is called solution. NaCl solution containing only 2 components are called binary solution. If the solute and water is the solute and water is the solute and the most important terms related to a solution is its concentration. It is defined as the number of parts solute present in 100 parts by mass of solution. 2. Mole fraction: It is defined as the number of moles of a particular component to the total number of moles of solution. For example, in a binary solution, if the number of moles of A and B are nA and nB respectively, then the mole fraction of A (xA) = nA/(nA + nB) and that of the component B (xB) = nB/(nA + nB) and that of the sum of the mole fractions of all the components in a solution is always equal to 1.3. Molarity (M): It is defined as the number of moles of solute dissolved per litre of solution. 1 M NaOH solution means 1 mole of NaOH is present in 1 L of solution. 4. Molality (m): It is defined as the number of moles of the solute dissolved per litre of solution. temperature because it is related to volume, which changes with temperature. All the others are temperature independent.

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