Atoms and molecules class 9 worksheet with answers

Atoms and Molecules Spreadsheet-8 What is the mass of 0.2 mole of oxygen atoms? Calculate the number of molecules of sulfur (S8) present in 16 g of solid sulfur. Calculate the number of aluminium ions in 0.051 g of aluminium oxide (Al2O3). The mass of an atom of element (X) is 2.0 × 10-23 g. Calculate the atomic mass. Calculate the molar mass of nitric acid. What is the number of molecules present 1.5 moles of ammonia (NH3) ? Explain why the number of atoms in a mole of hydrogen gas is twice as many atoms in a mole helium gas. If the valency of the carbon is 4 and sulfur is 2, what is the chemical formula and the name of the compound formed between carbon and sulfur atoms? A mole is quite often known as the chemist's. Dozen. Why is it so called? The mass of one molecule of a substance is 4.65 × 10–23 g. What is the molecular mass? The compound consists of carbon and oxygen. Give the compound an element forming an oxide A2O5. (i) What is the valency of item A? (ii) What will be the formula for chloride of the item? By analyzing an unclean sample of sodium chloride, the percentage of chlorine was found to be 45.5. What is the percentage of pure sodium chloride in the sample? What weight of calcium does the same number of atoms found in 3.2 g of sulfur contain ? Answer: a) 0.2 mole of oxygen atoms Mass of 1 mole of oxygen (O) atoms = 16 u Mass of 0.2 mole of oxygen (O) atoms = 0.2 × 16 = 3.2 u Gram molecular mass of sulfur (S8) = 8 × grams of atomic mass of sulfur = 8 × 32 g = 256 g No. of S8 molecules in 256 g sulfur = 6.022 × 1023 no. of S8 molecules in 16 g sulfur stage I : Number of moles of Al2O3 in 0.051 g Al2O3 Gram molecular mass al2O3 = 2 × grams of atomic mass of Al + 3 × grams of atomic mass of I = (2 × 27 g) + (3 × 16 g) = 102 g Now, 102 g Al2O3 = 1 mol Step II : Calculation of no. of Al ions in 0.0005 mole of Al2O3 1 mole by Al2O3 contains Al atoms = 2 × N0 0.0005 mole of Al2O3 contains Al atoms = 2 × 0.0005 × 10 = 2 × 0.0005 × 6,022 × 1023 = 6.022 × 1020 atoms In Al2O3 valency of Al = 3 + no. aluminium ions (Al3+) present are the same as the no. of Al atoms ∴ No. of Al3 + ions = 6,022 × 1,020 ions. One element atom (X) has mass = 2.0 × 10-23 g. 6,022 × 1,023 atoms of element (X) will have mass = (2.0 × 10-23 g) × (6,022 × 1023) = 12.044 ≈ 12.0 g Chemical formula of nitric acid is (HNO3) Molar mass HNO3 = (1 × atomic mass of H) + (1 × atom mass N) + (3 × atomic mass of O) = (1 × 1u) + (1 × 14u) + (3 × 16u) = 63u 1,1,1 0 mole of ammonia (NH3) contains = 6,022 × 1,023 molecules 1.5 mole of ammonia (NH3) contains = 9,033 × 1023 Molecules. Hydrogen gas is diaatomic in nature (H2) while helium gas is monoatomic (Han). As a result, the number of atoms in a mole of hydrogen (2 × NA) is double compared to the number of atoms in a mole of helium (NA) The chemical formula for the compound can be written by exchanging valencies (cross-over). Therefore, the expected formula is C2S4 or CS2. The compound is called carbon disulfide. A dozon represents a fixed number of articles, it will want 12. Similarly, a mole represents a fixed number of particles, it wants. Avogadros number (NA) or 6.022 × 1023 Given: Mass of one substance molecule = 4.65 × 10-23 g Mass of 6.0 22 × 1,023 molecules of substance = 6,022 × 1,023 × (4.65 × 10-23) = 10.65 28 g Compound is carbon monoxide (CO) Molecular weight (12u + 16 u = 28 u) Gram molecular weight = 28g Formula of oxide of the element = A2O5 (I) Valency of the element A in oxide = 5 (ii) The formula for chloride will be ACl5 Molecular mass of pure NaCl = Atomic mass na + atomic mass of Cl = 23 + 35,5 = 58,5u Percentage of chlorine in pure if chlorine is 60.6 parts, NaCl = 100 parts if chlorine is 45.5 parts, Thus, the percentage of pure sodium chloride in the sample is 75%. Number of atoms in 3.2 g sulfur Gram atomic mass of S = 32 g 32 g sulfur contains = 6,022 × 1023 atoms 3.2 g sulfur contains atoms step II. Weight of 6,022 × 1022 atoms of calcium Gram atomic mass of Ca = 40 g 6,022 × 1023 atoms of Ca weigh = 40 g 6.022 × 1022 atoms of Ca weigh . As a result of the GENERAL DATA PROTECTION REGULATION (GDPR). We do not allow internet traffic to byju's website from countries in the EU at this time. No tracking or performance measurement cookies were served on this page. Practice Quizes, Study Material, Semester Notes, MCQs, Free, Atoms and Molecules Spreadsheet (Chemistry, Exam, Class IX) Class 9 Notes | EduRev, shortcuts and tricks, mock tests for survey, Sample paper, pdf , Class IX) Class 9 Notes | EduRev, Video Lectures, Last Year's Papers, Atoms and Molecules Spreadsheet (Chemistry, Summary, DPI, Atoms and Molecules Spreadsheet (Chemistry, Last Year's Questions with Solutions, Class IX) Class 9 Notes | EduRev, Objective Type Questions, Extra Questions, Viva Questions, Important Questions; Given below are Class 9 Science CBSE spreadsheets for Atoms and Molecules (a) Short Questions (b) True and False Problems (c) Fill out the blank hope you like them and don't forget to like, social share and comment at the end of the page. During a chemical reaction, the sum of __ for the reactants and products remains unchanged. In a pure chemical compound, elements are always present in a _____ share by mass. Clusters of atoms that act as an ion are called ___ ions. In ionic compounds, the charge on each ion is used to determine the _____of connection. Avogadro constant _____ is defined as umber of atoms in exactly ___ of crbon-12 Mass of 1 mole of a substance called its The abbreviation used for length names of items is referred to as their _____. A chemical formula is also known as a _____ . The ions formed from single atoms are called _____. Ionic compounds are formed by the combination of _____ a _____. Valency of an ion is _____ to the load on ion. Mole is a link between _____ and _____ THE SI device for a drug is __. A. Masses Ready Polyatomic Chemical formula 86.022 x 1023, 12g Molar mass Symbol Molecular formula Simple ins Metal and non-metals Equal mass atoms and the number of atoms Mole Formula mass of $Na_2O $ is 62 amu. Those particles that have more or less electrons than the normal atoms are called ions. Formula for sulfur dioxide is SO_3. Molar mass ethyne (C_2H_2) is 26 g / mole. 22 gm of $CO_2 $ consists of 1 mole. The number of molecules in 32 grams of oxygen is $6.02\ times 10 ^ {23} $. Water is an atom. Formula for sulfur dioxide is SO_2. Clusters of atoms that act as an ion are called polyatomic ion. Mass of 1 mole of a substance is called its formula mass. In a pure chemical compound, elements are always present in a certain proportion of mass. ANSWER True 1. Define the concept of mole. Solution The mole is the amount of substance that contains the same number of particles (atoms/ions/molecules/formula units etc.) as there are atoms in exactly 12 g of carbon-12. 2.What is Avogadro's Number? Solution Avogadro constant $6,022 \hour 10^{23}$ is defined as the number of atoms in exactly 12 g of carbon-12. 3.What is gram atomic weight? Solution Gram atomic weight is the mass in grams 1 mole of atoms in a mono-nuclear chemical element 4. What's the difference between CO_2 and $2CO_2$? Solution $CO_2 $ means 1 molecule carbon dioxide $2CO_2 $ means 2 molecules carbon dioxide 5. Name the following compounds PC_3 and SO_2. Solution Phosphate carbon and sulfur dioxide 6. In the minimum whole number ratio must N and O atoms be combined to make the nitrousal into tetroxide $N_2O_4 $? What is the mole relationship between the elements of this compound? Solution 7.How many moles of sodium atoms equates to $1.56 \times 10^ {21} $ atoms of sodium? Solution Sodium Atoms = 1.56×10^{21} Avogadro number = $6,022 \times 10^{23}$ $Moles = \frac {1.1..56\times 10^{21}} { 6,022 \times 10^{23}}$ $Moles = 0.26 \times 10^{-2}$ 8. What is the relationship between the formula weight of a substance and the molar mass? Solution The molar mass of any substance is its atomic mass, molecular mass or formula mass in grams per mole. 9. How many grams of silver are in 0.263 moles of g? Solution 1 Mole of Silver is 107.86 gm 0.263 moles of silver will be = 107.86 * 0.263=28.367 gm 10.How many atoms are $ 1.00 \ times 10 ^ {-9} g lead? Solution 1 moles with Pb = 207.2g or 207.2 g have $6,022 \times atoms 1.00×10^{-9} will have = $\frac {6.022 \times 10^{23}}{207.2 g} \times {1.00 \times 10^{-9}}=2.91 \times 10^{12}$ atoms. 11.How many grams of iron is required to combine with 25.6g O to make Fe_2O_3? Solution Moleweight of Fe = 55.85 Molecular Weight o = 16.00 Molecular Weight of $Fe_2O_3 = (55.85) \times 2 + (16) \times 3 = 111.7+48 = 149.70 $ For 48 gm O, Fe required is 111.7 gm So for 25.6 gm O, Fe required is 59.57 gm 12.What is the mass of 4 moles of aluminum atoms? (Atomic mass of Al = 27u) Solution mass of 1 mole of aluminium atoms = 27 g. Mass of 4 moles of aluminum atoms = (27 x 4) = 108 g. 13.Calculate the mass of $ 6.022 \ times 10 ^ {22} $ atoms of Han. Solution $6,022 \times 10^{23}$ atom of Helium weight 4g Therefore $6,022 \times 10 ^ {22} $ atoms of Helium will weigh $ = \ frac {4 \times 6.022 \\ times 10^{22}}{6.022 \times 10^{23}} =0.4g$ 14.Calculate the number of moles in $3,011 \times 10^{22}$ molecules of carbon dioxide. Solution 6.022×10^{23} is 1 mole 3.011×10^{22} will be .05 mole 15.A sample of 45.8g of H_2SO_4 contains how many moles of $H_2SO_4 $? Solution molar mass of H_2SO_4 = 98.078 g/mol Number of moles Number of moles = $\frac {45.8}{98.078}=0.467$ moles 16.Whats mass in grams 5 moles of Fe? Solution Molecular mass fairy = 55.845 g / mole 1 mole of Fe weighs = 55.845g 5 moles of Fe weigh = $ 55,845 \ times 5 = 279.225 $ g 17.How many moles of NaCl are present in 20 gm of the drug? Solution Molar mass of $NaCl$ = 58.4 g/ mol Number of moles in 20.0 g NaCl is = $\frac {20}{58.4}= .342 $ mol 18.How many grams of O are present in 50 gm of $CaCO_3$? Solution Molecular mass of $CaCO_3$ = $40 + 12 + 16 \times 3 = 100 $ No of moles in 50 grams = $ \ frac {50 }{ 100} = 0.5 $1 $CaCO _3 $ molecule has three oxygen atoms so a mole $CaCO_3 $ atom has 3 mole oxygen atom or 48 gm oxygen So 0.5 mol will have = 0.5 * 48 = 24 grams of oxygen 19.How many grams $CO_2 $ are present in 0.1 mole $CO_2 $? Solution molecular mass of CO_2 = 44 Mass = number of moles * molecular mass = 0.1 * 44 = 4.4 g 20.Describe the difference between the mass of a mole of oxygen atoms (O) and the mass of a mole of oxygen molecules ($O_2 $). Solution Mass of mole of oxygen atom , that is, an O is present = O = 16 grams Mass of mole of $O_2 $, Oxygen gas = $O_2 $ = 16 + 16 = 32 grams So a mole of oxygen atoms has only half the mass of a mole of oxygen molecules 21.What do you understand by the term Formula Device? Solution A formula unit in chemistry is the empirical formula of an ionic or colic network-fixed compound that is used as an independent device for stoichiometric calculations. It is the lowest whole number ratio of ions represented in an ionic connection. link to this page by copying the following textClass 9 Science CBSE spreadsheets for Atoms and Molecules Also read class 9 Mathematics Class 9 Science Science Science

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