CLASS IX : ASSIGNMENT : CHAPTER-3 : ATOMS AND MOLECULES : SCIENCE (CHEMISTRY)

One mark questions

1. Define 1 atomic mass unit.
2. What is the basic difference between atoms and molecules?
3. Atoms of inert gas elements are monoatomic while the other elements are not. Assign reason. http://www.physicsinduction.com
4. Name the cation and anion which constitute the molecule of magnesium chloride.
5. Name a non-metal, which is tetra-atomic.

Two marks questions

6. Calculate the percentage composition of calcium nitrate.
   http://www.physicsinduction.com
7. How many gram molecules are present in 4.9g of H_2SO_4?
8. Calculate the mass of 6.022×10^{23} molecules of O_2.
9. Calculate the mass (in u) of 10 moles of sodium sulphate.

Three marks questions

10. What is the number of molecules of CO_2 which contain 8 g of O_2?
11. How many atoms of hydrogen and nitrogen are present in 0.5 mole of NH_3?
12. The percentage of the three elements calcium, carbon, and oxygen in a given sample of calcium carbonate is given as: http://www.physicsinduction.com
    Calcium = 40%, carbon =12%, oxygen = 48%.
    If the law of constant composition is true, what weights of these elements will be present in 1.5g of another sample of calcium carbonate?
13. A flask, P contains 0.5 mole of oxygen gas. Another flask, Q contains 0.4 mole of ozone gas. Which of the two flasks contains a greater number of oxygen atoms?
14. Calculate the number of molecules of Sulphur (S_8) present in 8g of solid Sulphur. (Given: atomic mass of sulphur = 32 u). http://www.physicsinduction.com
15. Calculate the number of molecules of phosphorus (P_4) present in 248 g of solid phosphorus. (Given: atomic mass of phosphorus= 31 u)
16. Calculate the number of Aluminium ions present in 0.102g of Aluminium oxide.

Five marks questions

17. (a) Write the names of compounds represented by the following formulae:
    (i) $CaCO_3$ (ii) $Al_2(SO_4)_3$ (iii) K_2SO_4
    (b) (i) Calculate the formula unit mass of $CaCO_3$. http://www.physicsinduction.com
    (ii) What is the mass of 0.5 mole of $CaCO_3$?
    (iii) How many molecules of $CaCO_3$ are present in its 1 mole?
18. Define Avogadro number.
    (a) Show that 100g of water and 100 g of carbon dioxide are not equal in number of moles. The molecular mass of water and carbon dioxide is 18 u and 44 u respectively.
    http://www.physicsinduction.com

(b) Calculate the number of molecules present in the 100 g for both water and carbon dioxide. http://www.physicsinduction.com

19.(a) Explain the law of constant proportion by taking ammonia as an example.

(b) Write the atomicity of the following molecules:

(i) Chlorine   (ii) Phosphorus

(c) Calculate the molecular mass of the following:

(i) C_2H_5OH (ii) H_2SO_4

20. (a) Which of the following has a greater number of molecules?

(i) 10 g of Nitrogen (N_2) gas   (ii) 10 g of Ammonia (NH_3) gas

(b) A 0.24 g sample of a compound of oxygen and boron was found by analysis to contain 0.096 g of boron and 0.144 g of oxygen. Calculate the percentage composition of the compound by weight. http://www.physicsinduction.com

21.A liquid compound X of molecular mass 18 u can be obtained from a number of natural sources. All the animals and plants need liquid X for their survival. When an electric current is passed through 200 grams of pure liquid X under suitable conditions, then 178 grams of gas Y and 22 grams of gas Z are produced. Gas Y is produced at the positive electrode whereas gas Z is obtained at the negative electrode. Moreover, gas Y supports combustion whereas gas Z burns itself causing explosions.   http://www.physicsinduction.com

(a) Name: (i) liquid X,   (ii) gas Y and   (iii) gas Z.

(b) What is the ratio of the mass of element Z to the mass of element Y in the liquid X?

(c) Which law of chemical combination is illustrated by this example?

(d) Name two sources of liquid X.

(e) State an important use of Y in our life.

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