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| Board – CBSE | Class – 11ᵗʰ | Topic – Basic Concepts of Chemistry |
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1. Find out the value of molecular weight of the given compounds:
   a) $CH_4$
   b) $H_2O$
   c) $CO_2$

2. Find out the empirical formula of an oxide of iron having 69.9% Fe and 30.1% $O_2$ by mass.

3. Find out the mass of $CH_3COONa$ (sodium acetate) required to make 500 mL of 0.375 molar aqueous solution. Molar mass of $CH_3COONa$ is 82.0245 $gmol^{-1}$

4. How much Cu (Copper) can be obtained from 100 gram of $CuSO_4$ (copper sulphate)?

5. In 3 moles of ethane $(C_2H_6)$, calculate the given below:
   a) No. of moles of C- atoms
   b) No. of moles of H- atoms.
   c) No. of molecules of $C_2H_6$.

6. The density of $CH_3OH$ (methanol) is 0.793 $kgl^{-1}$. For making 2.5 Litre of its 0.25 M solution what volume is needed?

7. What are significant figures?

8. Express the given number in scientific notation:
   a) 0.0047
   b) 235,000
   c) 8009
   d) 700.0
   e) 5.0013

9. The mass percent of iron and oxygen in an oxide of iron is 69.9 and 30.1 calculate the molecular formula of the oxide of iron. 159.69 $gmol^{-1}$ is the given molar mass of an oxide.

10. The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction 2A + 4B → 3C + 4D, when 5 moles of A react with 6 moles of B, then
    a) Which is the limiting reagent?
    b) Calculate the amount of C formed?

11. A box contains some identical red colored balls, labelled as A, each weighing 2 grams. Another box contains identical blue colored balls, labelled as B, each weighing 5 grams. Consider the combinations AB, AB₂, A₂B and A₂B₃and show that law of multiple proportions is applicable.

# CHEMISTRY

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12. Define the law of multiple proportions. Explain it with two examples. How does this law point to the existence of atoms?

13. Chlorine is prepared by adding manganese dioxide with hydrochloric acid acc. to the reaction. $4HCl(aq) + MnO_2(s) \rightarrow 2H_2O(l) + MnCl_2(aq) + Cl_2(g)$

    How many grams of HCl react with 5 g of manganese dioxide?

14. A welding fuel gas contains hydrogen and carbon. If we burn a small sample, we get 3.38 g of carbon dioxide and 0.69 g of water. A volume of 10 L (at STP) of this welding gas weighs 11.6 g. Find:

    a) Empirical formula

    b) Molar mass of the gas, and

    c) Molecular formula

15. Calculate molar mass of Argon isotopes according to the data given in the table.

    | Isotope | Molar mass | Abundance |
    |---------|-----------|-----------|
    | $^{36}Ar$ | 35.96755 gmol$^{-1}$ | 0.337% |
    | $^{38}Ar$ | 37.96272 gmol$^{-1}$ | 0.063% |
    | $^{40}Ar$ | 39.9624 gmol$^{-1}$ | 99.600% |

16. Calculate the mass of $_1C^{12}$ atom in g.

17. What is the molarity of the solution of ethanol in water in which the mole fraction of ethanol is 0.040? (Assume the density of water to be 1)

18. Which of the given below have the largest no. of atoms? Solve.

    a) 1 g Au (s)

    b) 1 g Na (s)

    c) 1 g Li (s)

    d) 1 g of $Cl_2$ (g)

19. If 10 volumes of dihydrogen gas react with 5 volumes of dioxygen gas, how many volumes of vapor would be obtained?

20. What is the distance covered by the light in 2 ns if the speed of light is $3 \times 10^8 \text{ ms}^{-1}$