

Chemical Calculations :



Here are the questions extracted from the provided images:

1. Calculate the molecular mass of the following:
 - (i) H_2O
 - (ii) CO_2
 - (iii) CH_4
2. Calculate the mass percent of different elements present in sodium sulphate (Na_2SO_4).
3. Determine the empirical formula of an oxide of iron which has 69.9% iron and 30.1% dioxygen by mass.
4. Calculate the amount of carbon dioxide that could be produced when:
 - (i) 1 mole of carbon is burnt in air.
 - (ii) 1 mole of carbon is burnt in 16 g of dioxygen.
 - (iii) 2 moles of carbon are burnt in 16 g of dioxygen.
5. Calculate the mass of sodium acetate (CH_3COONa) required to make 500 mL of 0.375 molar aqueous solution.
6. Calculate the concentration of nitric acid in moles per litre in a sample which has a density of 1.41 g/mL and the mass percent of nitric acid in it being 69%.
7. How much copper can be obtained from 100 g of copper sulphate ($CuSO_4$)?
8. Determine the molecular formula of an oxide of iron in which the mass percent of iron and oxygen are 69.9 and 30.1 respectively.
9. Calculate the atomic mass (average) of chlorine using the following data:

%Natural Abundance	Molar Mass	
^{35}Cl	75.77	34.9689
^{37}Cl	24.23	36.9659

10. In three moles of ethane (C_2H_6), calculate the following:
 - (i) Number of moles of carbon atoms.
 - (ii) Number of moles of hydrogen atoms.
 - (iii) Number of molecules of ethane.
11. What is the concentration of sugar ($C_{12}H_{22}O_{11}$) in mol/L if its 20 g are dissolved in enough water to make a final volume up to 2 L?