1. X compound contains 1.28 g of sulphur and 2.84 g of chlorine. What is the empirical formula of this compound?
   [Relative atomic mass: S, 32; Cl, 35.5]

   ![Sulphur](image1.png)  ![Chlorine gas](image2.png)

2. What is the empirical formula of X compound that contains 29.2% of sodium, 40.6% of sulphur and 30.2% of oxygen?
   [Relative atomic mass: Na, 23; S, 32; O, 16]

   ![Sodium](image3.png)  ![Sulphur](image4.png)  ![Oxygen gas](image5.png)  ![Sodium thiosulphate](image6.png)
3. A compound contains 92.3% of carbon and 7.7% of hydrogen by mass. Its relative molecular mass is 78. Find the molecular formula of this compound.

\[ \text{Relative atomic mass: } C, 12; H, 1 \]

4. 1.35 g of aluminium reacts with excessive copper (II) oxide to produce aluminium oxide powder and copper. Find the number of copper atoms produced.

\[ \text{Relative atomic mass: } Al, 27; \text{ Avogadro constant: } 6.02 \times 10^{23} \text{ particles} \]

5. If 448 cm\(^3\) hydrogen gas at s.t.p burns completely with excessive oxygen gas, what is the mass of water produced?

\[ \text{Relative atomic mass: } H, 1; O, 16; \text{ Molar volume: } 22.4 \text{ dm}^3 \text{ at s.t.p} \]

6. Ammonia, (NH\(_3\)) reacts with hydrogen chloride, (HCl) to form ammonium chloride (NH\(_4\)Cl), as equation, \( \text{NH}_3 + \text{HCl} \rightarrow \text{NH}_4\text{Cl} \). Calculate what masses of ammonia and hydrogen chloride are needed to produce 4 kg of ammonium chloride?

\[ \text{Relative Atomic Mass: } N, 14; H, 1; Cl, 35.5 \]
7. In industrial countries, mostly older people suffer from gastric pain. Medicine that can reduce gastric pain is called anti-acid. Anti-acid is a chemical compound which neutralizes acidic in stomach. Acid in stomach contains hydrochloric acid (HCl) which dissolve in water, which react with anti-acid to form water (H₂O), carbon dioxide (CO₂) and calcium chloride (CaCl₂). Generally anti-acid is a carbonate salt. If we see its content at the label outside the bottle, formula of the compound is calcium carbonate (CaCO₃) as anti-acid. What is the volume of carbon dioxide produced if 20g of calcium carbonate is used? 

[Relative Atomic Mass; Ca, 40; C, 12; O, 16; H, 1; Cl, 35.5; molar volume; 22.4 dm³ mol⁻¹ at s.t.p]