

STEP 1
FIND THE MOLES!

STEP 2
FIND RATIOS

STEP 3
Empirical Formula

STEP 4

UNIT V - NOMENCLATURE

10

I.

1) If you have a compound which is composed of 76.1g of nitrogen and 173.9g of oxygen, what is its empirical formula? If its formula mass is 92.0 g/mol, what is the molecular formula?

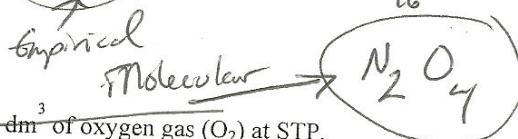
$$\frac{76.1 \text{ g N}}{14.00 \text{ g N}} = 5.43$$

$$\frac{5.43}{5.43} = 1$$

$$\frac{173.9 \text{ g O}}{16.00 \text{ g O}} = 10.86$$

$$\frac{10.86}{5.43} = 2$$

$$\text{NO}_2 = 46 \text{ g/mol} \quad \frac{92}{46} = 2$$



~~2) If you have a compound which is composed of 4.37g of phosphorus and 3.94 dm³ of oxygen gas (O₂) at STP, what is its empirical formula? If its formula mass is 284 g/mol, what is its molecular formula?~~

~~$\frac{4.37 \text{ g P}}{1}$~~

~~I will not ask you to calculate this.~~

~~We haven't covered STP. (Not the oil!)~~

S.

1) If you have a compound which is composed of 80.0% carbon and 20.0% hydrogen, what is its empirical formula? If its formula mass is 30.0 g/mol, what is its molecular formula?

$$\frac{80.0 \text{ g C}}{12.01 \text{ g C}} = 6.66 \quad \frac{6.66}{6.66} = 1$$

$$\text{CH}_2 = 15.034 \quad \frac{30}{15.034} = 2$$

$$\frac{20.0 \text{ g H}}{1.008 \text{ g H}} = 19.84 \quad \frac{19.84}{6.66} = 2.99 \approx 3$$

Empirical → CH_2
Molecular → C_2H_6

2) If you have a compound which is composed of 58.0% sodium and 42.0% oxygen, what is its empirical formula? If its formula mass is 78.0 g/mol, what is its molecular formula?

$$\frac{58.0 \text{ g Na}}{22.99 \text{ g Na}} = 2.52 \quad \frac{2.522}{2.522} = 1$$

Empirical → NaO

$$\frac{42.0 \text{ g O}}{16.00 \text{ g O}} = 2.625 \quad \frac{2.625}{2.522} = 1$$

Molecular → $2 = \frac{78.0}{38.99} \rightarrow \text{Na}_2\text{O}_2$

~~3) If you have a compound which is composed of 97.9 L of chlorine gas (Cl₂) and 49.0 L of oxygen gas (O₂), what is its empirical formula? If its formula mass is 87.0 g/mol, what is its molecular formula?~~

~~I want have you do.~~

~~Empirical~~

~~Liters!~~

~~Molecular~~