

C11 - 3.1 - Mol Intro Notes

Molar Mass $\frac{g}{mol}$

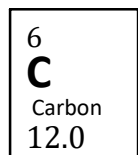
$\frac{6.02 \times 10^{23} \text{ particles}}{mol}$

- 1 dozen eggs = 12 eggs
- 1 mol eggs = 6.02×10^{23} eggs
- 1 mol particles = 6.02×10^{23} particles
- 1 mol atoms = 6.02×10^{23} atoms
- 1 pair shoes = 2 shoes
- 2 dozen pairs of shoes = 2×12 shoes
- 1 mol of pairs of shoes = $2 \times 6.02 \times 10^{23}$ shoes

Avogadro's #
 6.02×10^{23}

Equal moles of different elements contains the same number of particles.

Molar mass: the mass of one mole of particles



Carbon = $\frac{12g}{mol}$

Molar Mass = $\frac{g}{mol}$

1 mol Carbon = 12g Carbon

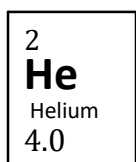
12 g Carbon

By Definition

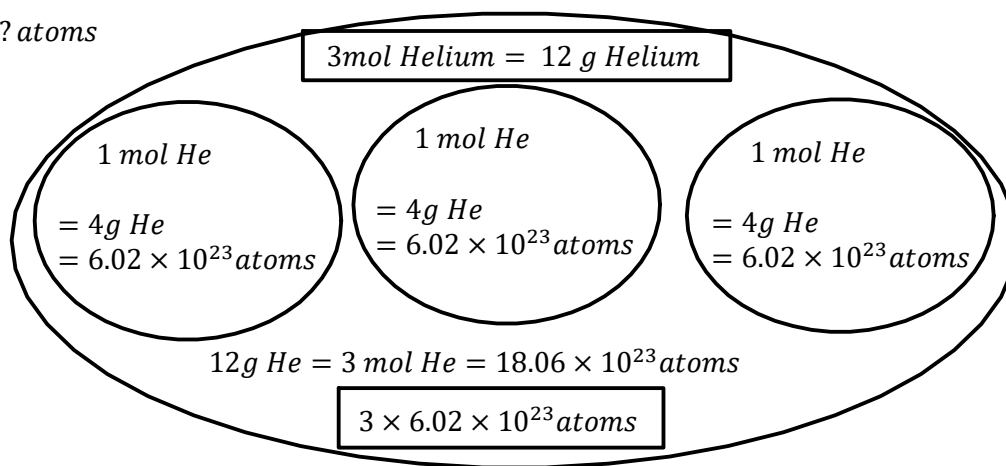
1 mol Carbon
 = 12g Carbon
 = 6.02×10^{23} atoms

2 mol Carbon
 = 24g Carbon
 = $2 \times 6.02 \times 10^{23}$ atoms

12g He = ? mol, ? atoms



He = $\frac{4g}{mol}$



Two Step

$12g \text{ He} \times \frac{1mol}{4g} = 3 \text{ mol He}$

①

$3 \text{ mol He} \times \frac{6.02 \times 10^{23} \text{ atoms}}{mol} = 1.806 \times 10^{24} \text{ atoms}$

②

$\times \frac{\text{-----}}{\text{-----}}$

Given units $\times \frac{\text{desired units}}{\text{given units}}$

$3 \times 6.02E23 = 1.806E24$

Comma 2nd , Above 7

Calculator

Because carbon is three times the mass of helium, the number of atoms in 12 g of helium is three times the number of atoms in 12 g of carbon.

One Step

OR

① $12g \text{ He} \times \frac{1mol}{4g} \times \frac{6.02 \times 10^{23} \text{ atoms}}{mol} = 1.806 \times 10^{24} \text{ atoms}$