Molar Mass Notes

* The mass of one mole of any substance is determined by the atomic mass units (a.m.u.) of each atom in that substance (see Periodic Table)
* Carbon-12 was used to determine the number of atoms in 12g of carbon (6.02×10^{23})

Conversion Factor → $\frac{1\ mol}{molar\ mass\ (g)}$ ← From Periodic Table

Calculating Molar Mass

1. Fe - atom
   55.85 g/mol

2. H_2O - molecule
   H: $2 \times 1.01 = 2.02$
   O: $1 \times 16.00 = 16.00$] add
   18.02 g/mol

3. $Ca_3(PO_4)_2$ (M + Poly ← Formula Unit)
   Ca: $3 \times 40.08 = 120.24$
   P: $2 \times 30.97 = 61.94$
   O: $8 \times 16.00 = 128.00$
   310.18 g/mol

Using Molar Mass

1. Calculate the mass of 1.85 moles of Iron.

G: 1.85 mol Fe U: ? g Fe E: 1 mol = 55.85 g

$$1.85\ \text{mol Fe} \times \frac{55.85\ g\ Fe}{1\ \text{mol Fe}} = 103.3225 \rightarrow \boxed{103\ g\ Fe}$$

(3 SF)

2. Determine the number of moles in 5.2g of $Fe(NO_3)_2$.

G: 5.2g $Fe(NO_3)_2$ U: ? mol $Fe(NO_3)_2$ E: 1 mol : 179.87 g

$$5.2\ g\ Fe(NO_3)_2 \times \frac{1\ mol\ Fe(NO_3)_2}{179.87\ g\ Fe(NO_3)_2} = 0.0289097 = \boxed{0.029\ mol\ Fe(NO_3)_2}$$

(2 SF.)

Fe: $1 \times 55.85 = 55.85$
N: $2 \times 14.01 = 28.02$
O: $6 \times 16.00 = 96.00$
179.87 g/mol