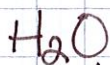


moles & mass (grams)

1 mol = molar mass (g)

molar mass - the sum of the atomic (average) mass of all atoms of each element in the compound.

(ex) dihydrogen monoxide

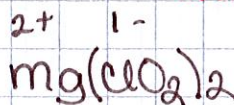


$$2 H \times 1.01g = 2.02g$$

$$1 O \times 16.00g = 16.00g$$

18.02g

magnesium chlorite



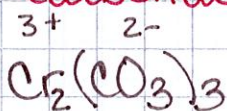
$$1 Mg \times 24.31g = 24.31g$$

$$2 Cl \times 35.45g = 70.90g$$

$$4 O \times 16.00g = 64.00g$$

159.21g

chromium(III) carbonate



$$2 Cr \times 52.00g = 104.00g$$

$$3 C \times 12.01g = 36.03g$$

$$9 O \times 16.00g = 144.00g$$

284.03g

phosphorous acid

Converting b/w mass & moles

$$1 \text{ mol} = \text{molar mass (g)}$$

(Ex) 1) What is the mass of 10.00 mol sodium sulfide?
 GIVEN Na_2S

$$\frac{10.00 \text{ mol Na}_2\text{S}}{1 \text{ mol}} \times 78.05 \text{ g} = 780.5 \text{ g Na}_2\text{S}$$

$$= 780.5 \text{ g Na}_2\text{S}$$

mm

$$2 \text{ Na} \times 22.99 \text{ g} = 45.98 \text{ g}$$

$$1 \text{ S} \times 32.07 \text{ g} = 32.07 \text{ g}$$

$$78.05 \text{ g}$$

2) How many moles are in 5.50 g of hydronitric acid?
 GIVEN $\text{H}^+\text{N}^{3-}\text{H}_3\text{N}$

$$\frac{5.50 \text{ g H}_3\text{N}}{17.04 \text{ g}} \times 1 \text{ mol} = 0.322769953 \text{ mol H}_3\text{N}$$

$$= 0.323 \text{ mol H}_3\text{N}$$

mm

$$3 \text{ H} \times 1.01 \text{ g} = 3.03 \text{ g}$$

$$1 \text{ N} \times 14.01 \text{ g} = 14.01 \text{ g}$$

$$17.04 \text{ g}$$

3) What is the mass, in grams, of 0.250 moles of titanium (III) nitrate?
 GIVEN $\text{Ti}(\text{NO}_3)_3$

$$\frac{0.250 \text{ mol Ti}(\text{NO}_3)_3}{1 \text{ mol}} \times 233.91 \text{ g} = 58.4775 \text{ g Ti}(\text{NO}_3)_3$$

MM

$$1 \text{ Ti} \times 47.88 \text{ g} = 47.88 \text{ g}$$

$$3 \text{ N} \times 14.01 \text{ g} = 42.03 \text{ g}$$

$$9 \text{ O} \times 16.00 \text{ g} = 144.00 \text{ g}$$

$$233.91 \text{ g}$$

4) How many moles are in $6.34 \times 10^2 \text{ g}$ of ammonium phosphide?
 GIVEN $(\text{NH}_4)_3\text{P}$

$$\frac{6.34 \times 10^2 \text{ g } (\text{NH}_4)_3\text{P}}{85.12 \text{ g}} \times 1 \text{ mol} = 7.448308271 \text{ mol } (\text{NH}_4)_3\text{P}$$

mm

$$3 \text{ N} \times 14.01 \text{ g} = 42.03 \text{ g}$$

$$12 \text{ H} \times 1.01 \text{ g} = 12.12 \text{ g}$$

$$1 \text{ P} \times 30.97 \text{ g} = 30.97 \text{ g}$$

$$85.12 \text{ g}$$

$$= 7.45 \text{ mol } (\text{NH}_4)_3\text{P}$$