

potassium carbonate K_2CO_3

K_2CO_3

$$K: 2 \times 39.10 = 78.20$$

$$138.21 \text{ g/mol}$$

$$C: 1 \times 12.01 = 12.01$$

$$O: 3 \times 16.00 = 48.00$$

$$\underline{138.21 \text{ g}} = 1 \text{ mol}$$

What would be the mass of 2.454 moles of K_2CO_3 ?

$$2.454 \text{ mol } K_2CO_3 \times \frac{138.21 \text{ g}}{1 \text{ mol}} = 339.17 \text{ g } K_2CO_3$$

How many formula units of K_2CO_3 would be present in 10.30 g of K_2CO_3 ?

PCl_3 unit = "molecule"

K_2CO_3 unit = "formula unit"

$$10.30 \text{ g } K_2CO_3 \times \frac{1 \text{ mol}}{138.21 \text{ g}} \times \frac{6.022 \times 10^{23} \text{ formula units}}{1 \text{ mol}} =$$

$$= 4.49 \times 10^{22} \text{ formula units } K_2CO_3$$

potassium carbonate K_2CO_3



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$= 4.49 \times 10^{22} \text{ formula units } K_2CO_3$

Percent Composition $\frac{x}{100} \frac{\text{part}}{\text{whole}} \times 100\%$

type A

A 6.25g sample of a compound was found to be composed of 2.50g C, 3.33g O, and 0.42g H. What is the percent composition?

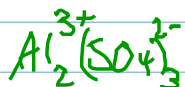
$$C: \frac{2.50g}{6.25g} \times 100\% = 40.00\% C$$

$$O: \frac{3.33g}{6.25g} \times 100\% = 53.28\% O$$

$$H: \frac{0.42g}{6.25g} \times 100\% = 6.72\% H$$

type B

What is the percent composition of aluminum sulfate?



$$Al: 2 \times 26.98 = 53.96g$$

$$S: 3 \times 32.07 = 96.21g$$

$$O: 12 \times 16.00 = 192.00g$$

$$342.17g$$

$$Al: \frac{53.96g}{342.17g} \times 100\% = 15.77\% Al$$

$$S: \frac{96.21g}{342.17g} \times 100\% = 28.12\% S$$

$$O: \frac{192.00g}{342.17g} \times 100\% = 56.11\% O$$

$\text{Fe}(\text{NO}_3)_3$ molar mass = 241.88 g/mol

$\text{Fe}_2(\text{SO}_4)_3$ molar mass = 399.91 g/mol

Which has more Fe as a percentage?

$$\text{Fe}(\text{NO}_3)_3 \quad \frac{55.85 \text{ g}}{241.88 \text{ g}} \times 100\% = 23.09\% \text{ Fe}$$

$$\text{Fe}_2(\text{SO}_4)_3 \quad \frac{111.70 \text{ g}}{399.91 \text{ g}} \times 100\% = 27.93\% \text{ Fe}$$

How many grams of Fe are in 23.36 g $\text{Fe}_2(\text{SO}_4)_3$?

$$23.36 \text{ g } \text{Fe}_2(\text{SO}_4)_3 \times \frac{27.93 \text{ g Fe}}{100 \text{ g } \text{Fe}_2(\text{SO}_4)_3} = 6.52 \text{ g Fe}$$

If I needed 78.13 g of Fe, how many grams of $\text{Fe}(\text{NO}_3)_3$ should I start with?

$$78.13 \text{ g Fe} \times \frac{100 \text{ g } \text{Fe}(\text{NO}_3)_3}{23.09 \text{ g Fe}} = 338.37 \text{ g } \text{Fe}(\text{NO}_3)_3$$