



**Determine the number of atoms found in 2.78 moles of carbon.**

$$2.78 \cancel{\text{ mol C}} \times \frac{6.02 \times 10^{23} \text{ atoms C}}{1 \cancel{\text{ mol C}}} = 1.67 \times 10^{24} \text{ atoms C}$$

**Determine the number of molecules found in 6.09 moles of NH<sub>3</sub>.**

Determine the number of atoms found in 12.6 moles of H<sub>2</sub>O.

$$12.6 \text{ mol H}_2\text{O} \times \frac{6.02 \times 10^{23} \text{ molecules H}_2\text{O}}{1 \text{ mol H}_2\text{O}} \times \frac{3 \text{ atoms}}{1 \text{ molecules H}_2\text{O}}$$

$2.28 \times 10^{25} \text{ atoms}$

Determine the number of atoms found in 2.78 moles of carbon.

Calculate the number of moles contained in 45.0g of  $\text{LiNO}_3$ .

$$45.0 \text{ g LiNO}_3 \times \frac{1 \text{ mol LiNO}_3}{68.95 \text{ g LiNO}_3} = \underline{\underline{0.653 \text{ mol LiNO}_3}}$$

$$\begin{aligned} \text{LiNO}_3 &\rightarrow (1 \times 6.94) + (1 \times 14.01) + (3 \times 16.00) && 1 \\ &= 68.95 \text{ g/mol} \end{aligned}$$

**Determine the percent composition of  $\text{CaSO}_4$ .**

$$\begin{aligned}\text{CaSO}_4 &\rightarrow (1 \times 40.08) + (1 \times 32.06) + (4 \times 16.00) \\ &\rightarrow 136.14 \text{ g/mol}\end{aligned}$$

A compound is composed of 31.0% Al, 13.8% C, and 55.2% O. Determine the empirical and molecular formula of the compound. The molar mass of the compound is 260.93 g/mol.

$$31.0 \text{ g Al} \times \frac{1 \text{ mol Al}}{26.98 \text{ g Al}} = \frac{1.149 \text{ mol}}{1.149 \text{ mol}} = 1$$

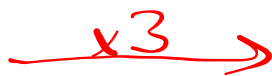
$$13.8 \text{ g C} \times \frac{1 \text{ mol C}}{12.01 \text{ g C}} = \frac{1.149 \text{ mol}}{1.149 \text{ mol}} = 1$$

$$55.2 \text{ g O} \times \frac{1 \text{ mol O}}{16.00 \text{ g O}} = \frac{3.450 \text{ mol}}{1.149 \text{ mol}} = 3$$

EMPIRICAL



$$86.99 \text{ g/mol}$$



MOLECULAR



$$260.93 \text{ g/mol}$$

$$\text{AlCO}_3 \rightarrow (1 \times 26.98) + (1 \times 12.01) + (3 \times 16.00)$$

$$86.99 \text{ g/mol}$$

# Worksheet

**Calculate the volume of 4.58 moles of oxygen gas at STP conditions.**