



Happy Birthday,
Jack!



Warm Up

A certain sample of oxygen gas contains 6.57×10^{56} molecules. What is the mass and volume of this sample?

Percent Composition

The relative amounts of element in a compound are expressed as the percent composition (by mass) for each element within the compound.

Ex. K_2CrO_4

K - 40.3%

Cr - 26.8%

O - 32.9%

Percent Composition from Mass Data

When a 13.60 g sample containing only magnesium and oxygen is decomposed, 5.40 g of oxygen is obtained. What is the percent composition of this compound?

$$\text{Mg} = \frac{8.20\text{g}}{13.60\text{g}} \times 100\% = 60.3\%$$

$$\text{O} = \frac{5.40\text{g}}{13.60\text{g}} \times 100\% = 39.7\%$$

$$13.60\text{g} - 5.40\text{g} = 8.20\text{g}$$

$$\text{O} = 39.7\%$$

$$\text{Mg} = 100 - 39.7\% = 60.3\%$$

Percent Composition from the Chemical Formula

Ex. Na_2CO_3

$$\begin{array}{r} 2 \text{Na} = 2 \times 22.99 = 45.98 \text{ g} \\ 1 \text{C} = 1 \times 12.01 = 12.01 \text{ g} \\ 3 \text{O} = 3 \times 16.00 = 48.00 \text{ g} \\ \hline 105.99 \text{ g} \text{---total} \end{array}$$

$$\text{Na} = \frac{45.98 \text{ g}}{105.99 \text{ g}} \times 100\% = 43.38\%$$

$$\text{C} = \frac{12.01 \text{ g}}{105.99 \text{ g}} \times 100\% = 11.33\%$$

$$\text{O} = \frac{48.00 \text{ g}}{105.99 \text{ g}} \times 100\% = \frac{45.29\%}{100\%}$$

Calculate the percent composition of propane (C_3H_8).

$$3 \times 12.01 = 36.03$$

$$8 \times 1.01 = \frac{8.08}{44.11}$$

$$C \rightarrow \frac{36.03}{44.11} \times 100\% = 81.68\%$$

$$H = \frac{8.08}{44.11} \times 100\% = 18.32\%$$

Homework

p. 306 #32, 33

p. 307 #34, 35