

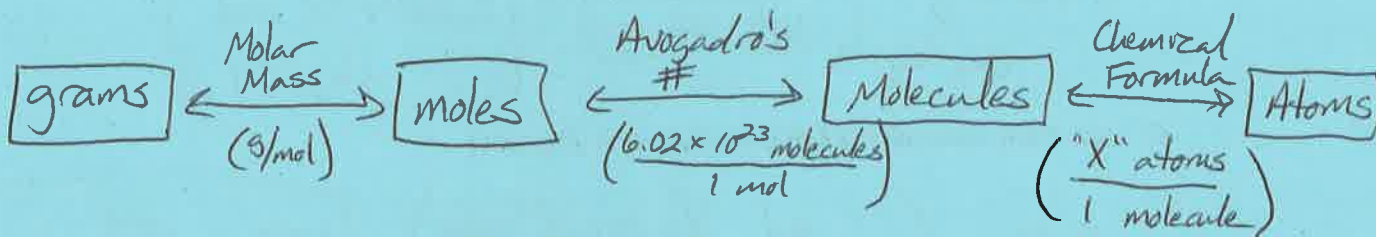
Mole Conversion Practice

Name Key

Block Date

Perform the following conversions, showing all of your work and reporting your final answer to the proper number of significant figures.

- 1) Draw a concept map that relates the units of grams, moles, molecules, and atoms and shows how to convert between the units.



- 2) How many molecules of P_2O_5 are there in 4.05 moles?

$$4.05 \text{ mol } P_2O_5 \left(\frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \right) = 2.44 \times 10^{24} \text{ molecules } P_2O_5$$

- 3) How many moles are there in 1.01×10^{21} molecules of CO_2 ?

$$1.01 \times 10^{21} \text{ molecules } CO_2 \left(\frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \right) = 0.00168 \text{ mol } CO_2$$

- 4) How many hydrogen atoms are there in 3.30 moles of NH_3 ?

$$3.30 \text{ mol } NH_3 \left(\frac{6.02 \times 10^{23} \text{ molecules } NH_3}{1 \text{ mol}} \right) \left(\frac{3 \text{ H atoms}}{1 \text{ molecule } NH_3} \right) = 5.96 \times 10^{24} \text{ H atoms}$$

- 5) How many moles of $AgCl$ are there in 0.450 grams?

$$0.450 \text{ g } AgCl \left(\frac{1 \text{ mol}}{143.32 \text{ g}} \right) = 0.00314 \text{ mol } AgCl$$

6) How many grams does 3.2 moles of H_2O weigh?

$$3.2 \text{ mol } \text{H}_2\text{O} \left(\frac{18.02 \text{ g}}{1 \text{ mol}} \right) = 57.7$$
$$= \boxed{58 \text{ g } \text{H}_2\text{O}}$$

7) How many moles are there in 0.0670g of Na_2SO_4 ?

$$0.0670 \text{ g } \text{Na}_2\text{SO}_4 \left(\frac{1 \text{ mol}}{142.04 \text{ g}} \right) = \boxed{0.000472 \text{ mol } \text{Na}_2\text{SO}_4}$$

8) How many molecules of K_3PO_4 are there in 5.00 grams?

$$5.00 \text{ g } \text{K}_3\text{PO}_4 \left(\frac{1 \text{ mol}}{212.28 \text{ g}} \right) \left(\frac{6.02 \times 10^{23} \text{ molec}}{1 \text{ mol}} \right) = \boxed{1.42 \times 10^{22} \text{ molecules } \text{K}_3\text{PO}_4}$$

9) How many grams would 9.02×10^{24} molecules of H_2O_2 weigh?

$$9.02 \times 10^{24} \text{ molecules } \text{H}_2\text{O}_2 \left(\frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molec}} \right) \left(\frac{34.02 \text{ g}}{1 \text{ mol}} \right) = 509.6 \text{ g}$$
$$= \boxed{510. \text{ g } \text{H}_2\text{O}_2}$$

10) A sample of NO_2 contains 2.2×10^{24} atoms of oxygen. How much does it weigh in grams?

$$2.2 \times 10^{24} \text{ atoms } \text{O} \left(\frac{1 \text{ molecule } \text{NO}_2}{2 \text{ O atoms}} \right) \left(\frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molec}} \right) \left(\frac{46.01 \text{ g}}{1 \text{ mol}} \right) = \boxed{84 \text{ g } \text{NO}_2}$$

11) A sample of Cl_2 weighs 10.05 g, how many chlorine atoms are in the sample?

$$10.05 \text{ g } \text{Cl}_2 \left(\frac{1 \text{ mol}}{70.90 \text{ g}} \right) \left(\frac{6.02 \times 10^{23} \text{ molec}}{1 \text{ mol}} \right) \left(\frac{2 \text{ Cl atoms}}{1 \text{ molec}} \right) = \boxed{1.707 \times 10^{23} \text{ atoms } \text{Cl}}$$