Vocabulary: Stoichiometry

Vocabulary

- Avogadro's number – the number of atoms or molecules in a *mole* of a substance.
  - Avogadro's number is equal to 6.0221415×10^{23}.
- Balanced equation – an equation that has equal numbers of atoms on each side of the equation.
  - The equation $H_2 + O_2 \rightarrow H_2O$ is *unbalanced* because there are two oxygen atoms on the left side and only one on the right.
  - The equation $2H_2 + O_2 \rightarrow 2H_2O$ is balanced because there are four hydrogen atoms and two oxygen atoms on each side of the equation.
- Cancel – to cross out, remove, delete, or invalidate something.
  - In an algebraic expression, identical terms that are found in the numerator and denominator can be cancelled, such as the unit "seconds" in this equation:

$$120 \cancel{\text{ seconds}} \cdot \frac{1 \text{ minute}}{60 \cancel{\text{ seconds}}} = 2 \text{ minutes}$$

- Coefficient – a number that multiplies a term in an equation.
  - In a chemical equation, the coefficients indicate the number of each type of molecule. For example, $6H_2O$ means that there are six water molecules.
- Conversion factor – a ratio or fraction equivalent to one that is used to multiply or divide a quantity when converting from one unit to another.
  - For example, the conversion factor for moles of CO_2 to liters of CO_2 is:

$$\frac{1 \text{ mol } CO_2}{22.41 \text{ L } CO_2}$$

    This conversion factor is equivalent to one because one mole of carbon dioxide has a volume of 22.41 liters.
- Dimensional analysis – a technique in which comparison of units on both sides of an equation is used to solve problems.
- Formula mass – the mass of one unit of a compound, as measured in unified mass units (u). For example, to find the formula mass of NaCl
  - For example, the formula mass of NaCl is found by adding the average atomic masses of sodium (Na) and chlorine (Cl): 22.99 u + 35.45 u = 58.44 u.

- Molar mass – the mass of one mole of a substance.
    - The molar mass of a compound in grams per mole is equal to the formula mass of the compound in unified mass units.
    - For example, the formula mass of oxygen (O_2) is 32 unified mass units (32 u). The molar mass of oxygen gas is 32 grams per mole, or 32 g/mol.
- Mole – (mol) a unit amount of a substance.
    - A mole of a substance has the same number of particles as 12.0 grams of carbon-12.
    - This number of particles is equal to Avogadro's number (6.0221415×10^{23}).
- Molecular mass – (M) the mass of a molecule of a substance, as measured in unified mass units (u).
- Stoichiometry – the relationships between quantities of substances that take part in a chemical reaction.