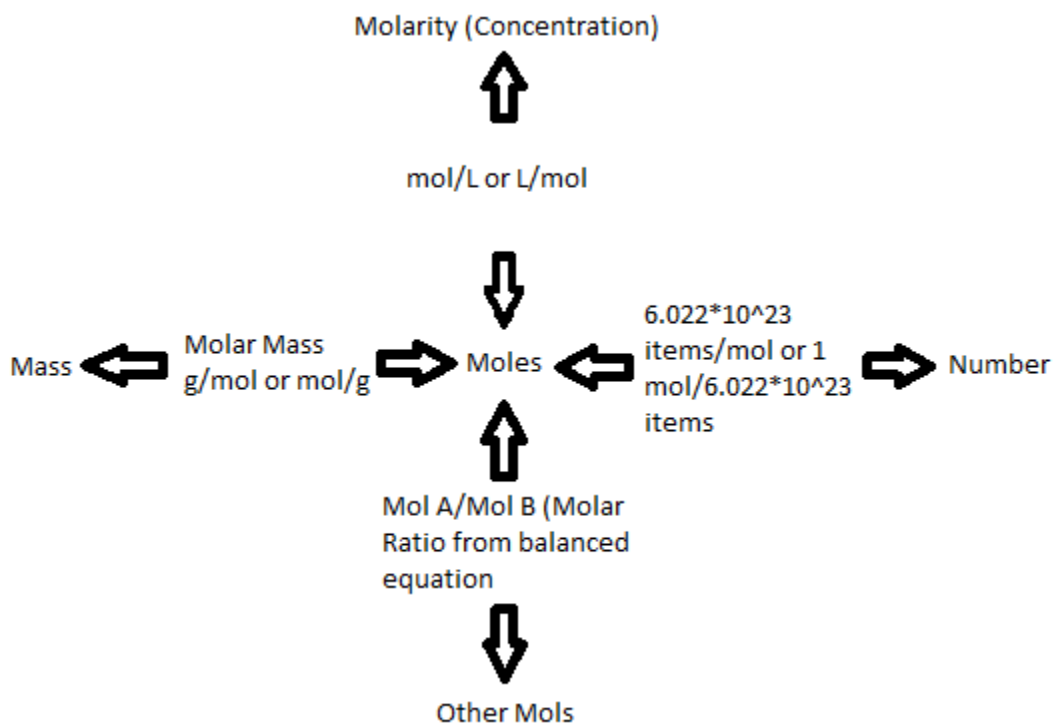


Chemistry Unit Analysis



Unit analysis is a powerful tool to master in the sciences. You can often find answers you need without having full knowledge of the topic if you can simply identify the item you're looking for and convert to it utilizing what you have available. The above map shows the relationships between many of the most common units used in chemistry. To solve a problem using unit analysis, follow the format below.

1. Start with what you have
2. Place conversion factors in a manner that allows your units to cancel
3. Multiply everything on top and bottom, then divide the two areas

Ex.

$$\frac{65 \cancel{\text{g CO}_2} \left| \frac{1 \cancel{\text{mol CO}_2}}{44.01 \cancel{\text{g CO}_2}} \right| \frac{6.022 \cdot 10^{23} \text{ molecules CO}_2}{1 \cancel{\text{mol CO}_2}}}{1} = 8.9 \cdot 10^{23} \text{ molecules CO}_2$$

The reason this works is because we're essentially multiplying each time by a fancy form of 1. If we say at $1 \text{ mol} = 6.022 \cdot 10^{23} \text{ items}$, then we can divide either side of the equation by a term to get:

$$\frac{6.022 \cdot 10^{23} \text{ items}}{1 \text{ mol}} = 1 \quad \text{or} \quad \frac{1 \text{ mol}}{6.022 \cdot 10^{23} \text{ items}} = 1$$

Source: Created by Keith Scranton, Chemistry Tutor, winter 2017