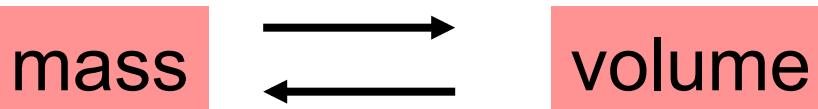
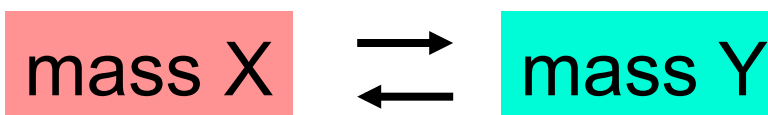


This is a list of the most common relationships used throughout general chemistry calculations. You must know which ideas are related for each and how to use them as conversion factors.

1. Density



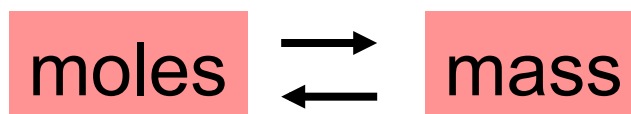
2. Mass percent



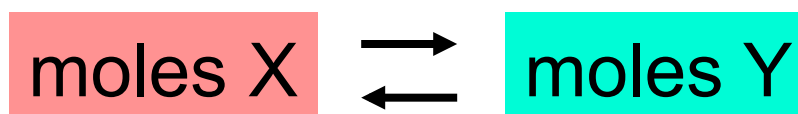
3. Avogadro's Number



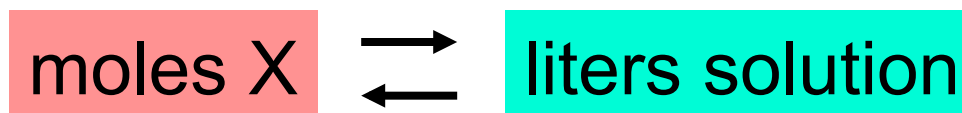
4. Molar mass



5. Stoichiometry



6. Molarity



1. Density

mass



volume

- convert from mass to volume

$$6.54 \cancel{\text{g}} \left(\frac{1 \text{ cm}^3}{0.7857 \cancel{\text{g}}} \right) = 8.32 \text{ cm}^3 = 8.32 \text{ mL}$$

- convert from volume to mass

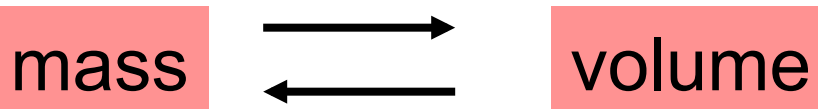
$$28.56 \cancel{\text{cm}^3} \left(\frac{0.7857 \cancel{\text{g}}}{1 \cancel{\text{cm}^3}} \right) = 22.44 \text{ g}$$

- calculate density directly

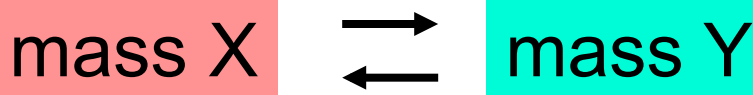
$$\text{density} = \frac{371 \text{ g}}{19.3 \text{ cm}^3} = 19.2 \text{ g/mL}$$

This is a list of the most common relationships used throughout general chemistry calculations. You must know which ideas are related for each and how to use them as conversion factors.

1. Density



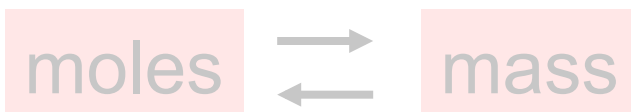
2. Mass percent



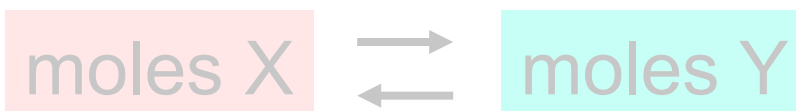
3. Avogadro's Number



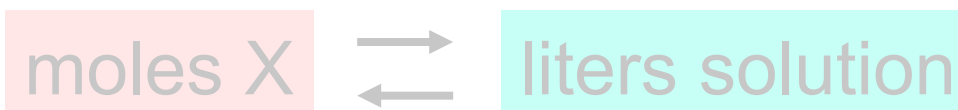
4. Molar mass



5. Stoichiometry

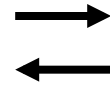


6. Molarity



2. Mass percent

mass X

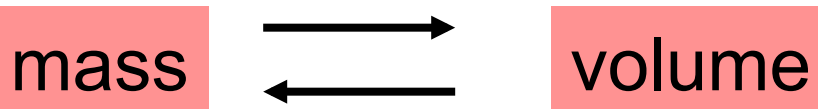


mass Y

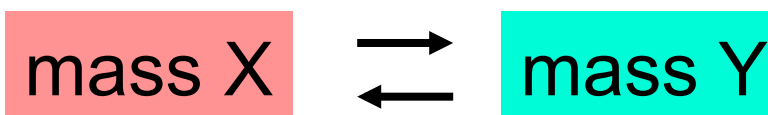
$$55.5 \text{ g CuF}_2 \left(\frac{37.42 \text{ g F}}{100 \text{ g CuF}_2} \right) = 20.8 \text{ g F}$$

This is a list of the most common relationships used throughout general chemistry calculations. You must know which ideas are related for each and how to use them as conversion factors.

1. Density



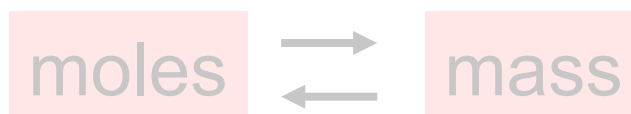
2. Mass percent



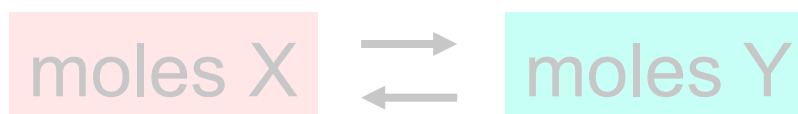
3. Avogadro's Number



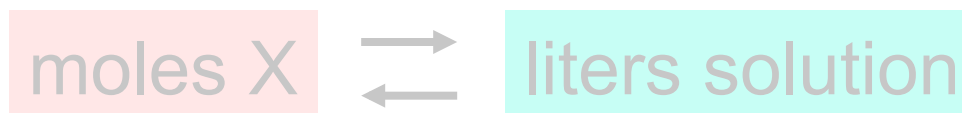
4. Molar mass



5. Stoichiometry



6. Molarity



3. Avogadro's Number $\text{moles} \rightleftharpoons \text{number of things}$

- number of things to moles

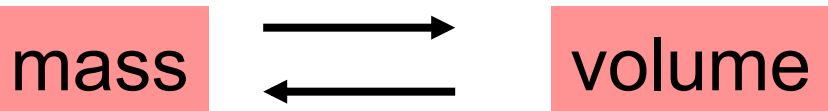
$$3.7 \times 10^{24} \text{ Al atoms} \left(\frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ atoms}} \right) = 6.1 \text{ moles of Al}$$

- moles to number of things

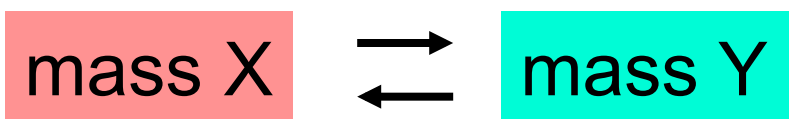
$$5.52 \text{ mole sulfur} \left(\frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mole sulfur}} \right) = 3.32 \times 10^{24} \text{ sulfur atoms}$$

This is a list of the most common relationships used throughout general chemistry calculations. You must know which ideas are related for each and how to use them as conversion factors.

1. Density



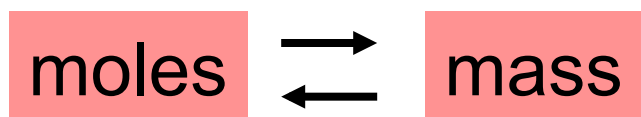
2. Mass percent



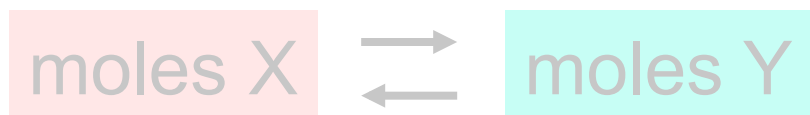
3. Avogadro's Number



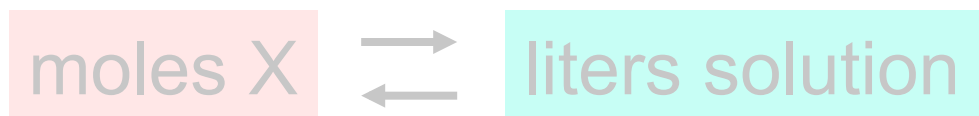
4. Molar mass



5. Stoichiometry

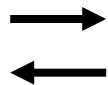


6. Molarity



4. Molar mass

moles



mass

- moles to mass

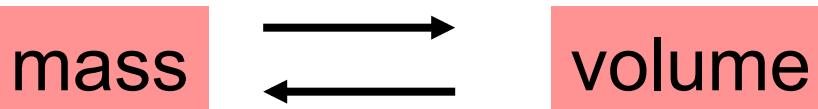
$$43.9 \text{ mole Xe} \left(\frac{131.3 \text{ g}}{1 \text{ mol Xe}} \right) = 5760 \text{ g Xe}$$

- mass to moles

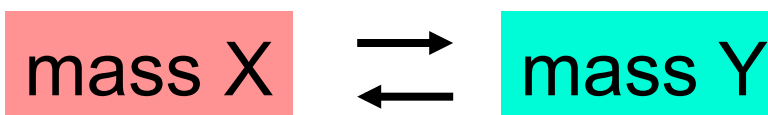
$$72.5 \text{ g CCl}_4 \left(\frac{1 \text{ mol CCl}_4}{153.8 \text{ g CCl}_4} \right) = 0.471 \text{ mol CCl}_4$$

This is a list of the most common relationships used throughout general chemistry calculations. You must know which ideas are related for each and how to use them as conversion factors.

1. Density



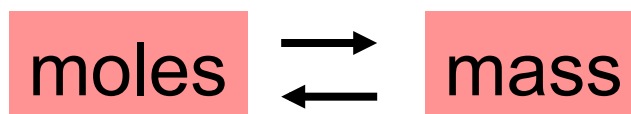
2. Mass percent



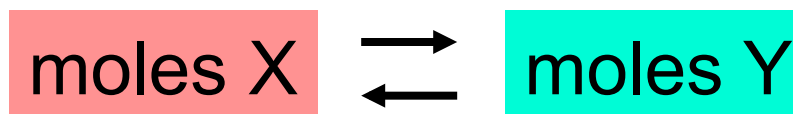
3. Avogadro's Number



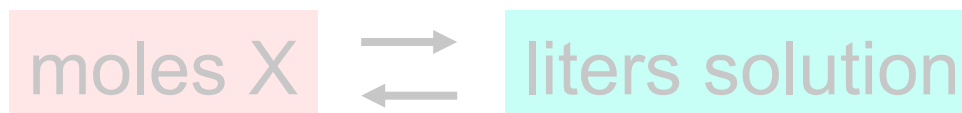
4. Molar mass



5. Stoichiometry

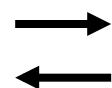


6. Molarity



5. Stoichiometry

moles X



moles Y

- stoichiometry of a compound formula

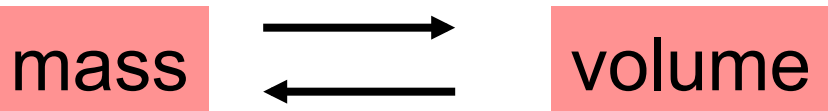
$$1.87 \text{ mole } \cancel{\text{C}_8\text{H}_{18}} \left(\frac{18 \text{ mol H}}{1 \text{ mol } \cancel{\text{C}_8\text{H}_{18}}} \right) = 33.7 \text{ mol H atoms}$$

- stoichiometry of a balanced reaction

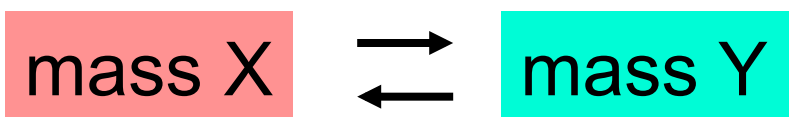
$$2.6 \text{ mole } \cancel{\text{N}_2\text{H}_4} \left(\frac{4 \text{ mol NH}_3}{3 \text{ mol } \cancel{\text{N}_2\text{H}_4}} \right) = 3.5 \text{ mol NH}_3$$

This is a list of the most common relationships used throughout general chemistry calculations. You must know which ideas are related for each and how to use them as conversion factors.

1. Density



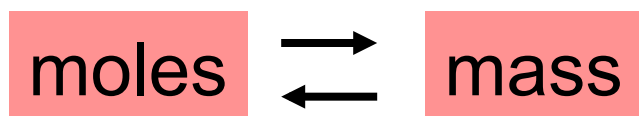
2. Mass percent



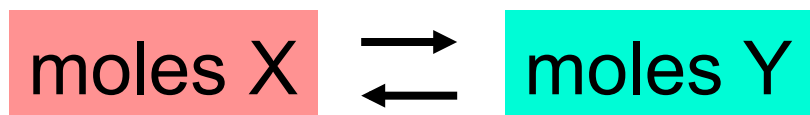
3. Avogadro's Number



4. Molar mass



5. Stoichiometry

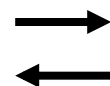


6. Molarity



6. Molarity

moles X



liters solution

- moles to liters

$$0.45 \text{ mole EtOH} \left(\frac{1 \text{ L soln}}{0.200 \text{ mol EtOH}} \right) = 2.3 \text{ L of solution}$$

- liters to moles

$$0.114 \text{ L soln} \left(\frac{1.85 \text{ mol KCl}}{1 \text{ L soln}} \right) = 0.211 \text{ mol KCl}$$

- calculate molarity directly

$$0.0324 \text{ g NaCl} \left(\frac{1 \text{ mol NaCl}}{58.4 \text{ g NaCl}} \right) = 5.55 \times 10^{-4} \text{ mole NaCl}$$

$$\text{molarity} = \frac{\text{moles X}}{\text{L soln}} = \frac{5.55 \times 10^{-4} \text{ mol NaCl}}{0.1224 \text{ L solution}} = 4.53 \times 10^{-3} \text{ M NaCl}$$