Worksheet 1: Stoichiometry

1. Find the molarity of a 34 ppb $C_{29}H_{60}$ rainwater solution.

2. How many mL of a 1.0×10^4 ppm $CuCl_2{\cdot}5H_2O$ solution are needed to make 500 mL of a solution that is 1.0×10^3 ppm in Cu?

3. How many mL of concentrated HCl are needed to make 500 mL of 0.250 M HCl? Concentrated HCl is 37.2% w/w HCl and has a density of 1.188 g/cm^3.

4. For the reaction $\mathrm{A} + 2\,\mathrm{B} \longrightarrow \mathrm{P}$, if 0.751 moles of A are mixed with 1.43 moles of B, what is the limiting reagent and how much of the other remains unreacted?

5. For the reaction $CH_3CO_2H\,(aq) + NaHCO_3(s) \longrightarrow CH_3CO_2{}^-\,(aq) + Na^+\,(aq) + CO_2(g) + H_2O\,(l)$, how many grams of vinegar are required to react with 5.00 g of $NaHCO_3$? Vinegar contains approximately 5% w/w acetic acid and its density is 1.00 g/mL.

6. Sketch a picture of a serial dilution scheme below. How is this different from a parallel dilution?

7. A bottle is labeled 56.2 ppm $FeCl_3$. Express this concentration in ppm Fe^{3+} and in molarity.