Quiz 3.3 – Concentration

Name: *Key*

Question 1

Give the molar concentration for each solution:

- $0.345\ g$ of $Mg(NO_3)_2$ are dissolved to make $150\ ml$ of solution

$$\frac{0.345g\ Mg(NO_3)_2}{0.150\ L} \cdot \frac{1\ mol\ Mg(NO_3)_2}{148.31g\ Mg(NO_3)_2} = 0.0155\ M$$

- $0.241\ g$ of CH_3COOH are dissolved to make $125\ ml$ of solution

$$\frac{0.241g\ HAc}{0.125\ L} \cdot \frac{1\ mol\ HAc}{60.05g\ HAc} = 0.0321\ M$$

Question 2

A student needs to make $100.00\ ml$ of a solution with $[Na_2SO_4] = 0.025\ M$ by diluting a stock solution with $[Na_2SO_4] = 0.334\ M$. How many ml of the stock solution should they use?

$$C_1V_1 = C_2V_2 \qquad 0.334M \cdot V_1 = 0.025M \cdot 100.0ml$$

$$V_1 = 7.49\ ml$$

Question 3

How many g of NaCl are contained within $135ml$ of a $0.187M$ NaCl solution?

$$\frac{135ml}{} \cdot \frac{1\ L}{1000ml} \cdot \frac{0.187\ moles}{1\ L} \cdot \frac{58.44g}{1\ mole} = 1.48g$$

Question 4

A water sample contains $0.592ppm$ of lead. Give the lead concentration in the following other units:

$0.592 \cdot 10^{-6}g\ Pb$ in $1g$ total, $1ml$ volume

- ppb

$$\frac{0.592 \cdot 10^{-6}g}{1g} \cdot 10^9\ ppb = 592\ ppb$$

- $\%m/m$

$$\frac{0.592 \cdot 10^{-6}g}{1g} \cdot 100\% = 5.92 \cdot 10^{-5}\ \%$$

- Molarity (assume the density of solution is $1.00g/ml$)

$$\frac{0.592 \cdot 10^{-6}g}{} \cdot \frac{1\ mol\ Pb}{207.2\ g\ Pb} = \frac{2.857 \cdot 10^{-9}\ mol}{0.001\ L} = 2.86 \cdot 10^{-6}\ M$$