Week 1 **Chem 112 Recitation Exercises**

Calculator (Casio FX-260)/math review

1. Calculate the following:

a. $3.25 \times 10^{-3} \times 0.00250 =$ (write your answer in scientific notation)

b. $\dfrac{1.56\times10^{-8}}{\left(1.35\times10^{-2}\right)^2\left(1.75\times10^{-3}\right)} =$

c. $\log\left(\dfrac{101}{23.8}\right) =$

d. Solve for x in this equation: $2.54\times10^{-7} = x(3.22\times10^{-4})\left(4.57\times10^{-3}\right)^2$

e. Solve for x in this equation: $\log\left(\dfrac{1.27\times10^{-7}}{4.22\times10^{-8}}\right) = x\log\left(\dfrac{2.78\times10^{-2}}{9.27\times10^{-3}}\right)$

Solution concentration review

2. A solution of NaCl has a concentration of 0.250 M.

Calculate the following:

a. How many moles of NaCl are in 25.0 mL of this solution?

b. How many moles of Cl^- are in 25.0 mL of this solution?

c. How many moles of Na^+ are in 25.0 mL of this solution?

d. If deionized water is added to 25.0 mL of 0.250 M NaCl to give a total volume of 70.0 mL, what is the molarity of NaCl in the diluted solution?

f. If 25.0 mL of 0.250 M NaCl is mixed with 5.00 mL of 0.0350 M NaI and 15.0 mL of deionized water, what is the molarity of I^- in the solution?

3. The concentration (c) of a solution, which absorbs UV or visible light, can be calculated using Beer's law ($A = \varepsilon bc$) if the solution's absorbance (A) and molar absorptivity (ε) are known. Usually the sample container used to measure the absorbance has a light pathlength (b) of 1.00 cm. Calculate the molarity of a solution whose percent transmittance (%T) at 656 nm in a 1.00 cm cuvette was 37.9 given that $\varepsilon = 3.96 \times 10^4$ $cm^{-1}M^{-1}$.
$A = \log(100/\%T)$