26 point **Pre-lab assignment** for *Environmental Chemistry* on pages 95-101 at PULTZ
http://chemlab.truman.edu/files/2017/08/CHEM-131-Laboratory-Manual.pdf
Use significant figures and dimensional analysis. Your numerical answers may differ slightly from values at chemlab.

Use atomic masses from the periodic table at https://ptable.com/

1. Calculate the mass of KNO_3 which you would need to make 1.00 L of an aqueous solution whose concentration is 1.00×10^2 µg N/mL. N is the element nitrogen. I used 6 conversion factors in a single line.
+4

2. If the actual mass that you measure gives a nitrate solution whose concentration is 104 µg N/mL, tell how to prepare 500.0 mL of an aqueous nitrate solution that contains 10.4 µg N/mL. Include calculations.
+2

3. If you now have an aqueous nitrate solution whose concentration is 10.4 µg N/mL, do calculations and tell how to prepare 50.0 mL of a solution whose concentration is close to 4 µg N/mL and known precisely. You have the following sizes of volumetric pipets: 5.00 mL, 10.00 mL, 20.00 mL, 25.00 mL.
+2

4. If you dissolve 6.205 g of $Na_2S_2O_3 \cdot 5H_2O$ in deionized water and dilute to 1.00 L, calculate the molarity for the sodium thiosulfate solution.
+2

5. If you dissolve 0.810 g of $KH(IO_3)_2$ in deionized water and dilute to 1.00 L, calculate the molarity.
+2

6. Page 99 says
"Approximately 2 g of KI (measure to the nearest 0.001 g) is dissolved in 100 – 150 mL deionized water in an Erlenmeyer flask and 1 mL of 6 M H_2SO_4 is added to the resulting solution. Pipet 20.00 mL of the standard biiodate solution into the flask; I_2 will be formed from the reaction."
a. Identify the type of reaction that occurs. (Review chapter 5.)
+1

b. Write the balanced chemical equation for the reaction. Do <u>not</u> include spectator ions. Think about the purpose of H_2SO_4 given that only one product is mentioned. Show all work to get your answer.
+2

c. Prove the last statement in the paragraph below. Use significant figures and dimensional analysis. Your numerical answer may differ slightly from 20.00 mL. Use atomic masses from the periodic table at https://ptable.com/

> Titrate the liberated I_2 with the thiosulfate titrant until a pale straw (yellow) color is reached. Add a few drops of starch indicator. The solution should turn blue. Continue the adding titrant until the blue color is gone, which is the endpoint. If the solutions were made correctly with pure reagents, 2 g of KI and 20.00 mL of $KH(IO_3)_2$ should require 20.00 mL of the $Na_2S_2O_3$ titrant to reach the endpoint.

+4

7. If you dissolve 0.420 g of NaF in deionized water and dilute to 100.0 mL, calculate the molarity.
+2

8. Tell how to prepare 100.0 mL of 0.0100 M NaF from a solution that is 0.100 M NaF. Include calculations.
+2

9. If you dissolve 7.55 g of KCl in 100.0 mL of deionized water, calculate the molarity. What assumption must you make?
+3