October 30, 2018
AP Chem 2-1-2
Objective:
Warm up: 2011

A young, serious AP Chem student, Jeremiah, the bullfrog, is assigned the task of determining the mass percent of silver in an alloy of copper and silver by dissolving a sample of the alloy in excess nitric acid and then precipitating the silver as silver chloride.

1. First Jeremy prepares 50. mL of 6 M nitric acid. He is provided with a stock solution of 16 M nitric acid, two 100 mL graduated cylinders that can be read to ± 1 mL, a 100 mL beaker that can be read to ± 10 mL, safety goggles, rubber gloves, a glass stirring rod, a dropper, and distilled H_2O.
   a.) Calculate the volume, in mL, of 16 M nitric acid that the student should use for preparing 50. mL of 6 M nitric acid.

   b .) Briefly list the steps of an appropriate and safe procedure for preparing the 50. mL of 6 M nitric acid. Only materials selected from those provided to the student (listed above) may be used.

   c.) Explain why it is <u>not</u> necessary to use a volumetric flask (calibrated to 50.00 mL ± 0.05 mL) to perform the dilution.

   d.) During the preparation of the solution, the student accidently spills about 1 mL of 16 M HNO_3 on the bench top. The student finds three bottles containing liquids sitting near the spill: a bottle of distilled water, a bottle of 5 percent $NaHCO_3$(aq), and a bottle of saturated NaCl(aq). Which of the liquids is best to use in cleaning up the spill? Justify your choice.

2. Then Jeremy pours 25 mL of the 6 M HNO_3 into a beaker and adds a 0.6489 g sample of the alloy. After the sample completely reacts with the acid, some saturated NaCl(aq) is added to the beaker, resulting in the formation of an AgCl precipitate. Additional NaCl(aq) is added until no more precipitate is observed to form. The precipitate is filtered, dried, and weighed to constant mass in a filter crucible. The data are shown in the table below.

Mass of sample of copper - silver alloy	0.6489 g
Mass of dry filter crucible	28.7210 g
Mass of filter crucible and precipitate (1st weighing)	29.3587 g
Mass of filter crucible and precipitate (2nd weighing)	29.2599 g
Mass of filter crucible and precipitate (3rd weighing)	29.2598 g

   a.) Calculate the number of moles of AgCl precipitate collected.
   b.) Calculate the mass percent of silver in the alloy of copper and silver.

3. It is possible to determine the amount of copper in brass using Beer's Law. How could you design a procedure to determine the amount of copper in a sample of brass?

   Equation:
   A copper wire is dipped into a solution of silver nitrate.
   What happens as the reaction proceeds?

Assignment:. Worksheet Practice Stoichiometry due Thursday, 2-1-4. Lab Empirical/Molecular and Hydrate on Wednesday, October 31 due Nov. 9. Lab Redox on Nov. 7-9, due Nov. 16. Lab Hard Water Nov. 14- November 16 due Nov. 20. Chapter 3 and 4 are next, review stoichiometry, aqueous solutions, no notes required . . .. Study Session Mondays, 7:30.