Name _____ Lab Partner _____

TA Name _____ Section _____ Date _____

Qualitative Analysis Worksheet

As you work through the steps in the lab procedures, record your experimental values and the results on this worksheet.

During your lab, Ag^{+}, Ba^{2+}, and Fe^{3+} ions were separated by their solubility in the presence of various anions.

Part A

Complete the following table with your confirmatory test observations from Part A of the Qualitative Analysis lab.

Data Table A: Confirmatory Tests for Individual Ions

	Fe^{3+}	**Ba^{2+}**	**Ag^{+}**
Reaction with 6 M HCl			
Reaction with 0.05 M NaSCN			
Reaction with 6 M H_2SO_4			

Question 1: Which ion(s) precipitate when HCl is added?

Question 2: Which ion(s) precipitate when H_2SO_4 is added?

Part B

Question 3a: Based upon your observations from Part A, which ion(s) precipitate when HCl is added?

Question 3b: Which ion(s) remain in the supernatant?

Question 4a: Based upon the solubility rules in the introduction, which ion(s) remaining in the supernatant from step 4 will precipitate in basic solution?

Question 4b: Which ion(s) remain in the supernatant from step 5?

Question 5a: Based upon your observations in Part A and logic, which ion(s) remaining in the supernatant from step 6 will precipitate when H_2SO_4 is added?

Question 5b: Which ion(s) remain in the supernatant from step 7?

Question 6: Use the data you have acquired in Parts A and B to complete the flow chart below. It will serve as a reference for identifying the cations in an unknown solution in Part C. (*At each branch in the flow chart, you should list the ions that exist as solid compounds on the left, under the label "precipitate #." List ions that exist in solution on the right, under "supernatant." There should be from zero to three entries on each line. At the end, the ions should be separated and each of the three ions should be present at different places on the flow chart.*)

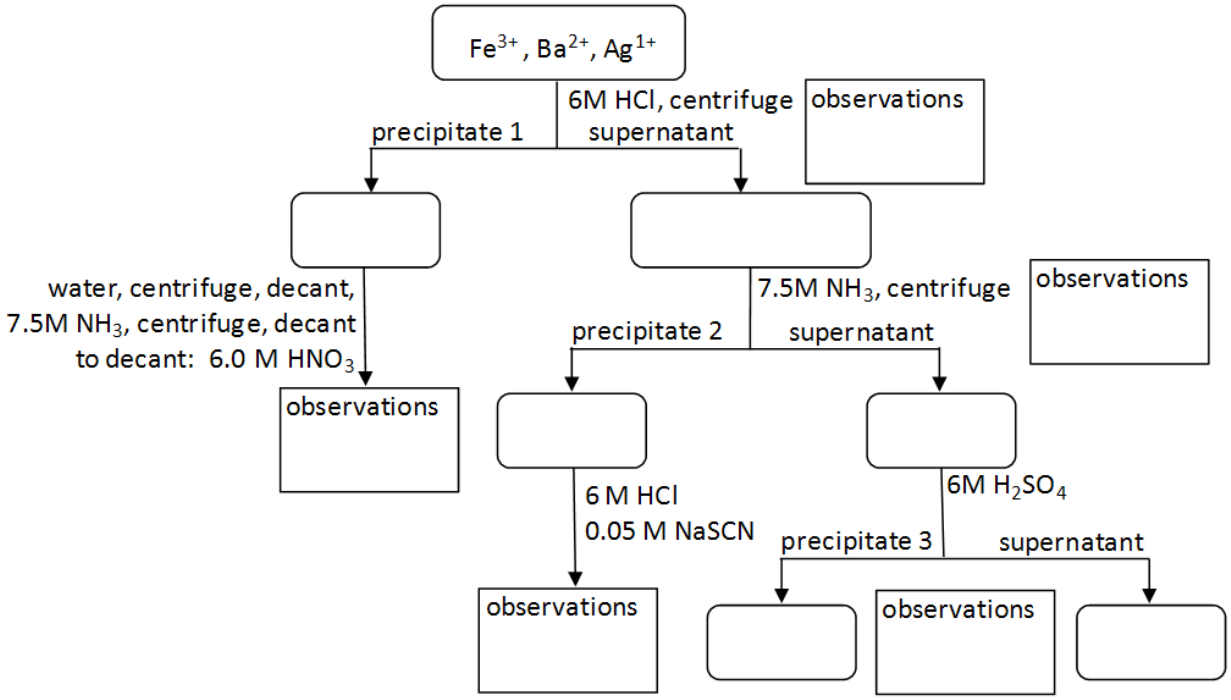

Figure 1: Qualitative Separation Scheme and Confirmation of Fe^{3+}, Ba^{2+}, and Ag^{+}

Part C

Question 7: Describe the location of each cation in the separation scheme and the confirmatory test used to confirm the presence of that ion.

Question 8: Complete the flow chart below for your unknown solution, identifying which (if any) ions are present at each branch and endpoint in the chart.

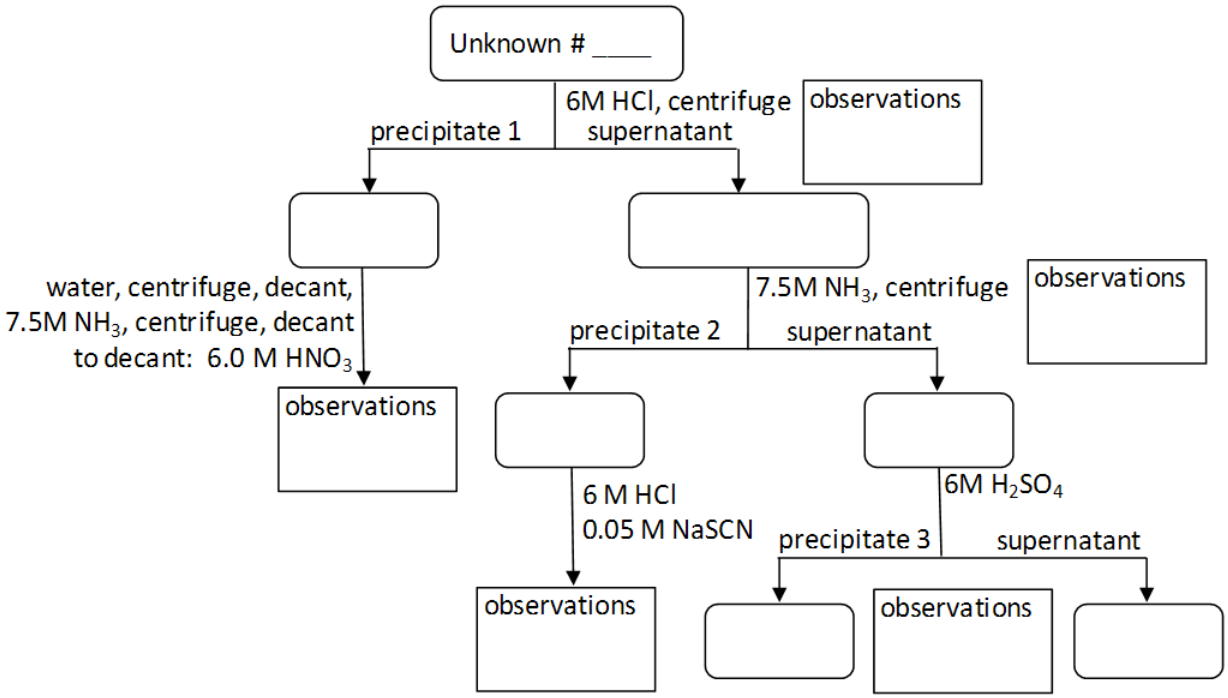

Figure 2: Qualitative Separation Scheme Template for Unknown Mixture

Question 9: Write the net precipitation reaction that occurs when HCl is added to an aqueous solution containing Fe^{3+}, Ba^{2+}, and Ag^{+} ions. (Use the lowest possible coefficients. Include states-of-matter under the given conditions in your answer.)

Question 10: Write the net precipitation reaction that occurs when a solution containing Fe^{3+} and Ba^{2+} is made basic (contains OH^{-}) from the addition of NH_3. (Use the lowest possible coefficients. Include states-of-matter under the given conditions in your answer.)

Question 11: Write the net precipitation reaction that occurs when H_2SO_4 is added to a solution containing Ba^{2+}. (Use the lowest possible coefficients. Include states-of-matter under the given conditions in your answer.)