**In-Class Activity**

Predicting Solubility with HSAB and Bronsted Acid/Base Strength

This activity is a guided approach to answering the following:

“Give an example of a silver (Ag+) salt that is expected to be soluble in water.”

1. Define the acid/base behavior of Ag+:
   1. How would you classify Ag+ using the HSAB principle?
   2. How would you classify Ag+ using Bronsted concepts of acid/base strength? Explain.
2. Examine solubility using the HSAB principle:
3. Write out the reaction for the precipitation of Ag+ and unknown base X, including H2O as an acid or base as appropriate. Label each known species as a hard or soft acid or base.
4. What type(s) of bases (hard, borderline, or soft) will cause the reaction to favor the side where Ag+ precipitates? Explain.
5. If you want Ag+ to be soluble in water (not precipitate), what type of base do you need?

3. Examine solubility using Bronsted concepts of acid/base strength:

1. Looking at your answer to 1b, what types of Bronsted bases will precipitate with Ag+? Explain.
2. If you want Ag+ to be soluble in water (not precipitate), what type of base do you need?

4. Give an example of a Ag+ salt that pairs Ag+ with a base that has the properties you listed in 2c and 3b. Explain how your chosen base meets both of these criteria.