

## Work Sheet 8 Addendum—More Solubility Equilibria

1. A solution is made with NaI and NaCl such that it is 0.01 M in both I<sup>-</sup> and Cl<sup>-</sup>. To 1 L of this solution 0.01 moles Cu(NO<sub>3</sub>)<sub>2</sub> are added (you can ignore any volume change). The NaI, NaCl, and Cu(NO<sub>3</sub>)<sub>2</sub> are completely soluble (as is NaNO<sub>3</sub> but you already knew that). The K<sub>sp</sub> for CuI is 1.3 x 10<sup>-12</sup> and for CuCl is 1.0 x 10<sup>-6</sup>.

After the solution has reached equilibrium what are the concentrations of the following?

[Cu<sup>2+</sup>]

[I<sup>-</sup>]

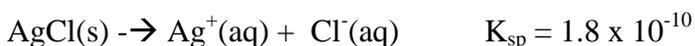
[Cl<sup>-</sup>]

Are there any solid precipitates? If so how many grams of each.

2. The K<sub>sp</sub> of PbCl<sub>2</sub> is 1.7 x 10<sup>-5</sup>. How many grams of PbCl<sub>2</sub> will dissolve in 100 mL of a 0.1 M NaCl solution?

3. Will CaF<sub>2</sub> be more soluble in acid or base?

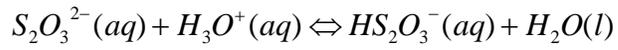
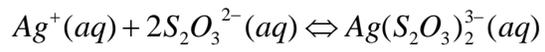
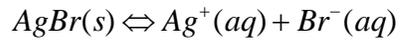
4. Consider the following reactions



You a saturated solution of AgCN, what will the effect of each of the following (nothing, more AgCN dissolves, some AgCN precipitates)

- A. Adding NaCl
- B. Adding HCl
- C. Adding HNO<sub>3</sub>
- D. Adding KCN
- E. Adding KNO<sub>3</sub>

5. A blast from the past



What is the effect of each of these on the solubility of AgBr(s)

1. Adding the soluble salt KBr
2. Adding the soluble salt  $\text{Na}_2\text{S}_2\text{O}_3$
3. Adding HCl
4. Adding solid AgBr