Chapter 15 **Extra Credit** **Name: _____**

1. Write the ionic equation for dissolution and the solubility product (K_{sp}) expression for each of the following slightly soluble ionic compounds:

(a) $PbCl_2$

(b) Ag_2S

(c) $Sr_3(PO_4)_2$

2. Use solubility products and predict which of the following salts is the most soluble, in terms of moles per liter, in pure water: CaF_2, Hg_2Cl_2, PbI_2, or $Sn(OH)_2$.

3. Calculate the molar solubility of each. Look up Ksp in the appendix.

(a) PbI_2

(b) Ag_2SO_4

4. Given the molar solubility, calculate K_{sp} for each of the slightly soluble solids indicated:

(a) AgBr: x = 5.7×10^{-7} *M*,

(b) PbF_2: x = 2.1×10^{-3} *M*,

5. The *Handbook of Chemistry and Physics* gives solubilities of the following compounds in grams per 100 mL of solution. Calculate the solubility product (Ksp) for each.

(a) $BaSiF_6$, 0.026 g/100 mL (contains SiF_6^{2-})

(b) $Ce(IO_3)_4$, 1.5×10^{-2} g/100 mL

6. Calculate the molar solubility of:

(a) $AgCl(s)$ in pure water.

$AgCl(s)$ in 0.010 *M* NaCl

How does the solubility change when a common ion is added?

(b) $CaF_2(s)$ in 0.00125 *M* KF

(c) $Ni(OH)_2(s)$ in a solution with pH of 12.00

7. Will a precipitate form given the concentrations indicated? (See appendix for K_{sp}values.)

(a) $CaCO_3$: $[Ca^{2+}] = 0.0020\ M$, $[CO_3^{2-}] = 0.010M$

(b) $Mn(OH)_2$: $[Mn^{2+}] = 1.0 \times 10^{-4}\ M$, $[OH^-] = 1.0 \times 10^{-5}\ M$

8. Draw the Lewis Structure for each and Label the Lewis Acids and the Lewis Bases (reactants only)

(a) $BF_3 + F^- \longrightarrow BF_4^-$

(b) $Al(OH)_3 + OH^- \longrightarrow Al(OH)_4^-$

Draw the Lewis Structure for each and Label the Lewis Acids and the Lewis Bases (reactants only) and predict the Products.

(a) $HCl(g) + NH_3(g) \longrightarrow$

(b) $NH_4^+ + C_2H_5O^- \longrightarrow$

9. A volume of .080 L of 2.0×10^{-3} M $Ba(NO_3)_2$ (aq) is added to .020 L of 5.0×10^{-3} M Li_2SO_4 (aq). Will a precipitate form?