

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 K_{sp} 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: $x = 5.7 \times 10^{-7} M$,

(b) PbF_2 : $x = 2.1 \times 10^{-3} M$,

5. The *Handbook of Chemistry and Physics* gives solubilities of the following compounds in grams per 100 mL of solution. Calculate the solubility product (K_{sp}) 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) $\text{AgCl}(s)$ in pure water.

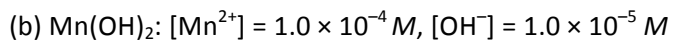
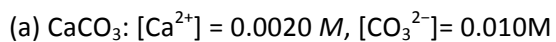
$\text{AgCl}(s)$ in 0.010 M NaCl

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

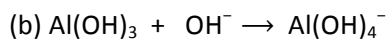
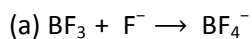
(b) $\text{CaF}_2(s)$ in 0.00125 M KF

(c) $\text{Ni}(\text{OH})_2(s)$ in a solution with pH of 12.00

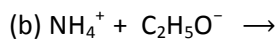
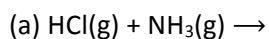
7. Will a precipitate form given the concentrations indicated? (See appendix for K_{sp} values.)



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



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



9. A volume of .080 L of 2.0×10^{-3} M $\text{Ba}(\text{NO}_3)_2$ (aq) is added to .020 L of 5.0×10^{-3} M Li_2SO_4 (aq). Will a precipitate form?