1. Given the equilibrium \( \text{PbCl}_2(s) + \text{H}_2\text{O}(l) \rightarrow \text{Pb}^{2+}(aq) + 2\text{Cl}^-(aq) \) for which \( \text{K}_{\text{sp}} = 1.7 \times 10^{-5} \).

A. What is the solubility of \( \text{PbCl}_2(s) \) in pure water?

B. What is the solubility of \( \text{PbCl}_2(s) \) in 2.50 \( \times 10^{-3} \) M lead nitrate solution?

C. What is the \( \text{Cl}^- \) concentration in pure water?

D. What is \( \text{Cl}^- \) concentration in 2.50 \( \times 10^{-3} \) M lead nitrate solution?
2. Given a solution in which $[\text{Ba}^{2+}] = 0.010\text{M}$. 

A. What concentration of sulfate ion, $\text{SO}_4^{2-}$ is required to just begin precipitating $\text{BaSO}_4$?

B. When the concentration of sulfate ion in the solution reaches $0.015\text{M}$ what concentration of barium ion will remain in solution?

3. Suppose you mix 100.0 mL of $0.0200\text{M} \text{ BaCl}_2$ solution with 50.0 mL of $0.0300\text{M} \text{ Na}_2\text{SO}_4$ solution. Will $\text{BaSO}_4$ precipitate?

4. If you have 150.0 mL of $0.0010\text{M}$ silver nitrate and to that solution you add 7.50 mL of $0.025\text{M}$ HCl will a precipitate form? Identify the precipitate.
5. Which is more soluble in pure water, silver chloride, AgCl(s) (Ksp = 1.8 x 10^{-10}), or silver chromate, Ag_2CrO_4(s) (Ksp = 1.8 x 10^{-12})?