G12 Chemistry: Class 14 Homework

1. a) Show the balanced equation for the solubility equilibrium that would occur when a solution of $Ba(NO_3)_2$ (aq) is mixed with a solution of Na_2SO_4 (aq). **[2 marks]**

   b) Write the solubility product constant equation for this equilibrium system. **[1 mark]**

2. Calculate the K_{sp} at 25°C for AgI (s), given that its solubility at this temperature is 2.14 x 10^{-7} g/100mL. **[4 marks]**

3. K_{sp} for $PbCl_2$ is 1.7 x 10^{-5} at 25°C. Calculate the molar solubility of $PbCl_2$.

   a. In pure water **[3 marks]**

   b. In 0.10 mol/L $CaCl_2$ **[4 marks]**

4. What amount of $PbCl_2(s)$ in grams, can dissolve in 1.00L of a 0.500 mol/L solution of LiCl(aq)? K_{sp} for $PbCl_2$ is 1.7×10^{-5} at 25°C. **[5 marks]**

5. Calculate the molar solubility of $Zn(OH)_2$ (s), if the K_{sp} is 3×10^{-17} at 25°C. **[3 marks]**

6. A solution contains 0.15 mol/L of NaCl and 0.0034 mol/L $Pb(NO_3)_2$. Does a precipitate form? Include a balanced chemical equation for the formation of the possible precipitate. K_{sp} for $PbCl_2$ is 1.7×10^{-5} at 25°C. **[4 marks]**

7. One drop (0.050ml) of 1.5 mol/L potassium chromate, K_2CrO_4 is added to 250 mL of 0.10 mol/L $AgNO_3$. Does a precipitate form? Include a balanced chemical equation for the formation of the possible precipitate. K_{sp} for Ag_2CrO_4 is 1.12×10^{-12} at 25°. **[6 marks]**

8. A chemist adds 0.010 g of $CaCl_2$ to 5.0×10^2 mL of 0.0015 mol/L sodium carbonate, Na_2CO_3. Does a precipitate of calcium carbonate form? Include a balanced chemical equation for the formation of the possible precipitate. K_{sp} for $CaCO_3$ is 3.36×10^{-9}. **[6 marks]**

9. 230ml of 0.0015M $AgNO_3$ is added to 130ml of 0.010M calcium acetate, $Ca(CH_3COO)_2$. Does a precipitate form? Include a balanced chemical equation for the formation of the possible precipitate. K_{sp} for $AgCH_3COO$ is 2.0×10^{-3}. **[6 marks]**

10. 250ml of 0.0011 mol/L $Al_2(SO_4)_3$ is added to 50ml of 0.022M $BaCl_2$. Does a precipitate form? Include a balanced chemical equation for the formation of the possible precipitate. K_{sp} for $BaSO_4$ is 1.08×10^{-10}. **[6 marks]**