Series N°4

Exercise N° 1:

1- Calculate the Ksp for Ce $(IO_3)_4$, given that its molar solubility is 1.80×10^{-4} mol/L.

2- The molar solubility of $Ba_3(PO_4)_2$ is 8.89×10^{-9} M in pure water. Calculate the K_{sp} for $Ba_3(PO_4)^2$

3- Barium Carbonate ($BaCO_3$) has a solubility product of $K_{sp} = 8.1 \times 10^{-9}$ at 25°C for the equilibrium

$BaCO_3 \rightleftharpoons Ba^{2+} + CO_3^{-2}$

a- Calculate the molar solubility of Barium Carbonate in the water at 25°C.

b- Calculate the molar solubility of Barium Carbonate in 0.1M $PbCO_3$.

Exercise N° 2:

Given copper (II) hydroxide, Cu $(OH)_2$. The concentration of Cu^{2+} and OH^- at equilibrium in 25°C water is 1.765×10^{-7}M and 3.530×10^{-7}M respectively.

a. Find the K_{sp}.

b. Find the molar solubility of Cu $(OH)_2$ in 0.100M NaOH.

Exercise N° 3:

1- An aqueous solution at 25 °C is 0.10 M in both Ba^{2+} and Ca^{2+} ions. One wants to separate the two ions by taking advantage of the different solubility of $BaCO_3$ and $CaCO_3$.

$BaCO_3$ Ksp=2.58×10^{-9}M.

$CaCO_3$ Ksp=3.36×10^{-9}M.

What is the highest possible CO_3^{2-} concentration that allows only one salt to present at equilibrium? Which ion is present in the solid, Ba^{2+} or Ca^{2+}?

2- Calculate the pH of a saturated solution of $Cu(OH)_2$, $K_{sp} = 1.6 \times 10^{-19}$

3- What is the minimum pH at which $Cr(OH)_3$ will precipitate if the solution has $[Cr^{3+}] = 0.0670$ M? K_{sp} of $Cr(OH)_3$ is 6.70×10^{-31}

4- When NaF is added slowly to a solution that is 0.025 M Ba^{2+} and 0.025 M Ca^{2+} what will the concentration of calcium be when the barium just begins to precipitate? K_{sp} $(BaF_2) = 1.0 \times 10^{-7}$; K_{sp} $(CaF_2) = 1.7 \times 10^{-10}$.

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