HW06 - Solubility Equilibria

This is a preview of the published version of the quiz

Started: Oct 21 at 9:55am

Quiz Instructions

Question 1 — 2 pts

What is the net ionic equation for the reaction between aqueous solutions of Na_3PO_4 and $CuSO_4$?

- $Cu^{2+} + PO_4^{3-} \longrightarrow CuPO_4$
- $2Na^{+} + SO_4^{2-} \longrightarrow Na_2SO_4$
- No reaction occurs since no precipitate is formed.
- $3Cu^{2+} + 2PO_4^{3-} \longrightarrow Cu_3(PO_4)_2$

Question 2 — 2 pts

What ions are present in solution after aqueous solutions of $Cu(NO_3)_2$ and K_2S are mixed? Assume we mixed stoichiometric equivalent amounts of both reactants and 100% reaction.

- No ions are present as both products form precipitates.
- Cu^{2+}, NO_3^{-}, K^{+}, S^{2-}
- K^{+}, NO_3^{-}
- Cu^{2+}, S^{2-}

Question 3 — 2 pts

Molar solubility is...

- the total molarity of the solution.
- equal to the K_{sp}.
- the number of moles that dissolve to give one liter of super-saturated solution.
- the number of moles that dissolve to give one liter of saturated solution.

Question 4 — 2 pts

The K_{sp} equation for sodium bicarbonate ($NaHCO_3$) should be written as:

- $K_{sp} = [Na^{+}][H^{+}][C^{4+}][O^{2-}]^3$

- $K_{sp} = [Na^+][HCO_3^-]$
- $K_{sp} = [Na^+][H^+][CO_3^{2-}]$
- $K_{sp} = [NaH^{2+}][CO_3^{2-}]$

Question 5

2 pts

Pure water is saturated with $PbCl_2$. In this saturated solution, which of the following is true?

- $[Pb^{2+}] = 0.5[Cl^-]$
- $K_{sp} = [Pb^{2+}][Cl^-]$
- $K_{sp} = [Pb^{2+}]^2[Cl^-]$
- $[Pb^{2+}] = [Cl^-]$

Question 6

2 pts

A hypothetical ionic substance T_3U_2 ionizes to form T^{2+} and U^{3-} ions. The solubility of T_3U_2 is 4.04×10^{-20} mol/L. What is the value of the solubility-product constant?

- 1.16×10^{-95}
- 1.08×10^{-97}
- 1.63×10^{-39}
- 9.79×10^{-39}

Question 7

2 pts

The value of K_{sp} for $SrSO_4$ is 2.8×10^{-7}. What is the solubility of $SrSO_4$ in moles per liter?

- 1.4×10^{-7}
- 2.8×10^{-7}
- 5.3×10^{-4}
- 7.6×10^{-7}

Question 8

2 pts

Determine the molar solubility of some salt with the generic formula AB_2 if $K_{sp} = 2.56 \times 10^2$.

- 1 M
- 10 M

- 0.1 M
- 4 M

Question 9

2 pts

Rank the following salts from least to most molar solubility:

BiI $K_{sp} = 7.7x10^{-19}$

$Cd_3(AsO_4)_2$ $K_{sp} = 2.2x10^{-33}$

$AlPO_4$ $K_{sp} = 9.8x10^{-21}$

$CaSO_4$ $K_{sp} = 4.9x10^{-5}$

- $Cd_3(AsO_4)_2 < BiI < AlPO_4 < CaSO_4$
- $Cd_3(AsO_4)_2 < AlPO_4 < BiI < CaSO_4$
- $CaSO_4 < BiI < AlPO_4 < Cd_3(AsO_4)_2$
- $AlPO_4 < BiI < Cd_3(AsO_4)_2 < CaSO_4$

Question 10

3 pts

A hypothetical compound MX_3 has a molar solubility of 0.00562 M. What is the value of K_{sp} for MX_3?

- 2.99×10^{-9}
- 3.16×10^{-5}
- 2.69×10^{-8}
- 9.48×10^{-5}

Question 11

2 pts

Determine if a precipitate will form when 0.96g Na_2CO_3 is combined with 0.2g $BaBr_2$ in a 10L solution. (For $BaCO_3$, $K_{sp} = 2.8x10^{-9}$).

- $BaCO_3$ precipitates
- It is impossible to know if any $BaCO_3$ will precipitate with the information given.
- $BaBr_2$ will remain in solid form as it is insoluble in water.
- $BaCO_3$ does not precipitate

Question 12

2 pts

$CaSO_4$ has a $K_{sp} = 3x10^{-5}$. In which of the following would $CaSO_4$ be the most soluble?

- 0.5 M K_2SO_4(aq)
- pure water
- $CaSO_4$ would have the same solubility in all three of these solutions
- 1.0 M $CaCl_2$(aq)

Question 13

2 pts

A solution of AgI contains 1.9 M Ag^+. K_{sp} of AgI is 8.3×10^{-17}. What is the maximum I^- concentration that can exist in this solution?

- 4.4×10^{-17} M
- 1.9 M
- 1.6×10^{-16} M
- 8.3×10^{-17} M

Question 14

3 pts

What would be the molar solubility of Li_3PO_4 ($K_{sp} = 2.37 \times 10^{-4}$) in a 1M LiCl solution?

- 5.44×10^{-2}
- 1.54×10^{-2}
- 1.24×10^{-1}
- 2.37×10^{-4}

Not saved

Submit Quiz