## HW06 - Solubility Equilibria

① 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 <sub>3</sub> PO <sub>4</sub> and CuSO <sub>4</sub> ?	
$\bigcirc Cu^{2+} + PO_4^{3-} \longrightarrow CuPO_4$	
$\bigcirc 2Na^+ + SO_4^{2-} \longrightarrow Na_2SO_4$	
No reaction occurs since no precipitate is formed.	
$\bigcirc 3Cu^{2+} + 2PO_4^{3-} \longrightarrow Cu_3(PO_4)_2$	
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 equivamounts of both reactants and 100% reaction.	⁄alent
No ions are present as both products form precipitates.	
○ Cu <sup>2+</sup> , NO <sub>3</sub> -, K <sup>+</sup> , S <sup>2-</sup>	
○ K*, NO <sub>3</sub> -	
○ Cu <sup>2+</sup> , S <sup>2-</sup>	
Question 3	2 pts
Molar solubility is	
the total molarity of the solution.	
equal to the K <sub>sp</sub> .	
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 <sub>sp</sub> equation for sodium bicarbonate (NaHCO <sub>3</sub> ) should be written as:	
$\bigcirc$ K <sub>sp</sub> = [Na <sup>+</sup> ][H <sup>+</sup> ][C <sup>4+</sup> ][O <sup>2</sup> -] <sup>3</sup>	

K <sub>xx</sub> = No.17(1)*(Co.2 <sup>2</sup> )           Cuestion 5         2 pts           Pure water is saturated with PbCl <sub>2</sub> . In this saturated solution, which of the following is true?           (Per*) = 0.8(cr)         (R <sub>xx</sub> = Pix-2*(Cr))           (R <sub>xx</sub> = Pix-2*(Cr))         (Pix-2*) = (Cr)           (Pix-2*) = (Cr)         (Pix-2*) =	$\bigcirc$ K <sub>sp</sub> = [Na <sup>+</sup> ][HCO <sub>3</sub> <sup>-</sup> ]	
Question 5       2 pts         Pure water is saturated with PbCl <sub>2</sub> . In this saturated solution, which of the following is true?         [Pta <sup>2</sup> ] = 0.9(G1]	$K_{sp} = [Na^+][H^+][CO_3^{2-}]$	
Pure water is saturated with PbCl <sub>2</sub> . In this saturated solution, which of the following is true?    Pb <sup>2</sup>   = 0.5(C1)	$K_{sp} = [NaH^{2+}][CO_3^{2-}]$	
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Question 6 2 pts  A hypothetical ionic substance T <sub>3</sub> U <sub>2</sub> ionizes to form T <sup>2+</sup> and U <sup>3-</sup> ions. The solubility of T <sub>3</sub> U <sub>2</sub> is 4.04x10 <sup>-20</sup> mol/L. What is the value of the solubility-product constant?  1.16 x 10 <sup>-60</sup> 1.16 x 10 <sup>-60</sup> 1.63x10 <sup>-30</sup> 9.79x10 <sup>-30</sup> Question 7 2 pts  The value of K <sub>60</sub> for SrSO <sub>4</sub> is 2.8x10 <sup>-7</sup> . What is the solubility of SrSO <sub>4</sub> in moles per liter?  1.4x x 10 <sup>-7</sup> 2.8x x 10 <sup>-7</sup> 5.3x x 10 <sup>-4</sup> 7.8 x 10 <sup>-7</sup> Question 8 2 pts  Determine the molar solubility of some salt with the generic formula AB <sub>2</sub> if K <sub>80</sub> = 2.56x10 <sup>-2</sup> .	○ [Pb <sup>2+</sup> ] = 0.5[Cl <sup>-</sup> ]	
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$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	○ 2.8 x 10 <sup>-7</sup>	
Question 8       2 pts         Determine the molar solubility of some salt with the generic formula $AB_2$ if $K_{sp} = 2.56 \times 10^2$ . $\bigcirc$ 1 M	○ 5.3 x 10 <sup>-4</sup>	
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○ 1 M		_ pt3
	Determine the molar solubility of some salt with the generic formula $AB_2$ if $K_{sp} = 2.56 \times 10^2$ .	
○ 10 M	○ 1 M	
	○ 10 M	

O.1 M		
○ 4 M		
Question 9		2 pts
Rank the following	ng salts from least to most molar solubility:	
Bil	$K_{sp} = 7.7 \times 10^{-19}$	
Cd <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>	$K_{sp} = 2.2 \times 10^{-33}$	
AIPO <sub>4</sub>	$K_{sp} = 9.8 \times 10^{-21}$	
CaSO <sub>4</sub>	$K_{\rm sp} = 4.9 \times 10^{-5}$	
	Tap	
Od <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub> <	Bil < AIPO <sub>4</sub> < CaSO <sub>4</sub>	
○ Cd <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub> <	AIPO <sub>4</sub> < Bil < CaSO <sub>4</sub>	
○ CaSO <sub>4</sub> < Bil <	$AIPO_4 < Cd_3(AsO_4)_2$	
○ AlPO <sub>4</sub> < Bil <	$Cd_3(AsO_4)_2 < CaSO_4$	
Question 10		3 pts
A hypothetical c	ompound $MX_3$ has a molar solubility of 0.00562 M. What is the value of $K_{sp}$ for $MX_3$ ?	
2.99 x 10 <sup>-9</sup>		
3.16 x 10 <sup>-5</sup>		
2.69 x 10 <sup>-8</sup>		
9.48 x 10 <sup>-5</sup>		
Question 11		2 pts
Determine if a p	recipitate will form when $0.96g \text{ Na}_2\text{CO}_3$ is combined with $0.2g \text{ BaBr}_2$ in a 10L solution. (For BaCO <sub>3</sub> , $K_{\text{sp}}$ = 2	<sup>9</sup> .8x10 <sup>-9</sup> ).
○ BaCO <sub>3</sub> precipi	itates	
O It is impossible	e to know if any BaCO <sub>3</sub> will precipitate with the information given.	
○ BaBr <sub>2</sub> will rem	ain in solid form as it is insoluble in water.	
○ BaCO <sub>3</sub> does n	not precipitate	
Question 12		2 pts
CaSO <sub>4</sub> has a K <sub>s</sub>	$_{\rm p}$ = 3x10 <sup>-5</sup> . In which of the following would CaSO <sub>4</sub> be the most soluble?	

○ 0.5 M K <sub>2</sub> SO <sub>4</sub> (aq)	
pure water	
CaSO <sub>4</sub> would have the same solubility in all three of these solutions	
1.0 M CaCl <sub>2</sub> (aq)	
Question 13	2 pts
A solution of AgI contains 1.9 M Ag $^+$ . K <sub>sp</sub> of AgI is 8.3 x 10 $^{-17}$ . What is the maximum I $^-$ concentration that can exist in this so	olution?
○ 4.4x10 <sup>-17</sup> M	
○ 1.9 M	
○ 1.6x10 <sup>-16</sup> M	
○ 8.3x10 <sup>-17</sup> M	
Question 14	3 pts
What would be the molar solubility of $\text{Li}_3\text{PO}_4$ ( $\text{K}_{\text{sp}}$ = 2.37 x 10 <sup>-4</sup> ) in a 1M LiCl solution?	
○ 5.44 x 10 <sup>-2</sup>	
○ 1.54 x 10 <sup>-2</sup>	
○ 1.24 x 10 <sup>-1</sup>	
$\bigcirc$ 2.37 x 10 <sup>-4</sup>	
○ 2.37 x 10 <sup>-4</sup>	
○ 2.37 x 10 <sup>-4</sup>	