Name _____ Block: _____ Date: _____

Chemistry 12

LE CHATELIER & SOLUBILITY EQUILIBRIUM

1. Consider the following equilibrium system:

$PbCl_2(s) \rightleftharpoons Pb^{2+}(aq) + 2Cl^{1-}(aq)$

Describe what happens to the solubility of $PbCl_2$ after each of the changes are made (increases, decreases, stays the same). Be sure to explain why!

a) $PbCl_2(s)$ is added _____

b) $Pb(NO_3)_2$ is added _____

c) NaCl is added _____

d) H_2O is added _____

e) $AgNO_3$ is added _____

f) NaBr is added _____

2. Consider the following equilibrium system:

$AgBr(s) \rightleftharpoons Ag^{+}(aq) + Br^{-}(aq)$

Describe what happens to the solubility of AgBr after each of the changes are made (increases, decreases, stays the same). Be sure to explain why!

a) AgBr(s) is added _____

b) $Pb(NO_3)_2$ is added _____

c) NaCl is added _____

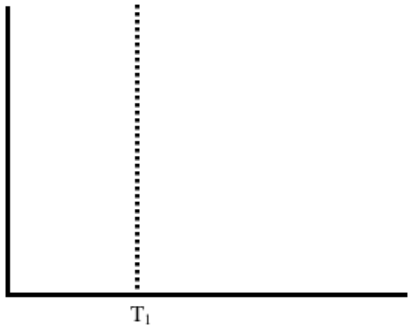
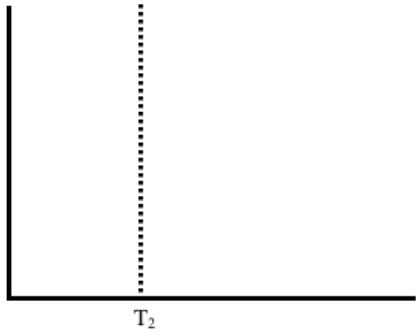
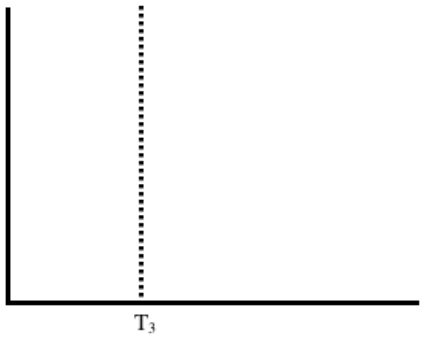
d) H_2O is added _____

e) $AgNO_3$ is added _____

f) NaBr is added _____

3. 500.000 g of iron (II) perchlorate is placed in 1.00 L water and stirred. The saturated solution is then filtered and the undissolved solid weighed and has a mass of 499.070 g. Calculate the solubility product constant for this salt.

4. Some $Ag_2CO_{3(s)}$ is placed into 3 – 1L beakers containing water to make a saturated solution of Ag_2CO_3.
   a) Discuss what happens to the solubility of silver carbonate when the following stresses are applied to each beaker.
   b) Sketch a [conc] vs time graph for each of the stresses.

T_1: some $Li_2SO_{4(s)}$ is added	T_2: the solution is placed in a 5L beaker	T_3: some $Fe(NO_3)_{3(s)}$ is added
a) What happens to the solubility? b)  	a) What happens to the solubility? b)  	a) What happens to the solubility? b) 

5. A 120.0 mL solution of 0.040 M $Cr(NO_3)_3(aq)$ is mixed with 75.0 mL of 6.5×10^{-3} M $Na_3PO_4(aq)$ and a precipitate just barely forms. Calculate the K_{sp} for the precipitate. Start by writing the complete ionic equation and the net ionic equation to identify the precipitate.

6. Will a precipitate form if 100.0 mL of a 2.0×10^{-4} M iron (II) nitrate is added to 50.0 mL of a 1.0×10^{-7} M strontium hydroxide solution? Start by writing the complete ionic equation and the net ionic equation to identify the precipitate.