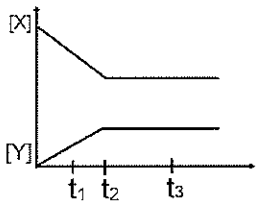
Name: _____ Class: _____ Date: _____ ID: A

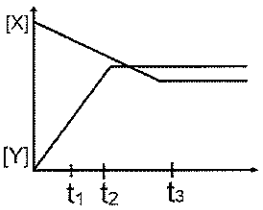
Q6 Practice Quiz Equilibrium #11-1 #11-2

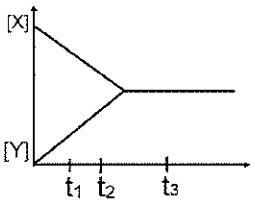
Multiple Choice
Identify the choice that best completes the statement or answers the question.

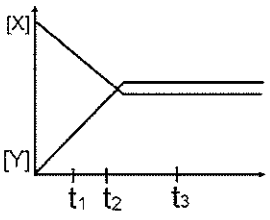
____ 1. (#11-1) Which of the following models would represent the following chemical equilibrium

$X \rightleftarrows Y$ Keq = 100

a. 

b. 

c. 

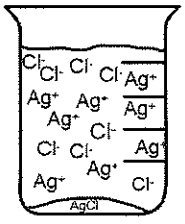
d. 

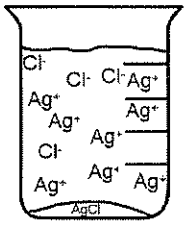
Best option

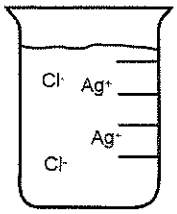
____ 2.

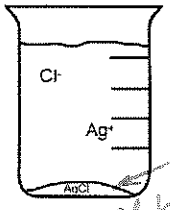
$AgCl \Leftrightarrow Ag^{+} + Cl^{-1}$ Ksp = 1.6E-10

(#11-1) AgCl is dissolved in distilled water until saturated. Pick the correct picture below that represents the system at equilibrium.

a. 

b. 

c. 

d. 

Solid present
Small K

____ 3.

$Mg(OH)_{2(s)} \Leftrightarrow Mg^{2+}_{(aq)} + 2OH^{-1}_{(aq)}$ Ksp = 1.35E-

(#11-2b) $Mg(OH)_2$ is dissolved in distilled water. The reaction runs unitl equilibrium saturation is ~~stablised~~. The $[Mg^{2+}] = .015M$ Which of the following values represents the concentration of the OH^{-1} ion?

a. .03M b. .015 c. $.015^2$ d. 1.8E-10

2:1 ratio

____ 4.

$Mg(OH)_{2(s)} \Leftrightarrow Mg^{2+}_{(aq)} + 2OH^{-1}_{(aq)}$ Ksp = 3.375E-6

(#11-2c) $Mg(OH)_2$ is dissolved in a solution containg 0.1M OH^{-1} hydroxides. What is the solubility of $Mg(OH)_2$ in this solution?

a. .03M
b. 3.375E-4
c. 3.375E-8
d. 1.8E-10

$Mg(OH)_2 \rightleftharpoons Mg^{2+} + 2OH^-$

–	0	.1
–	+x	+2x
–	x	.1+2x

$K_{sp} = x(.1)^2$

3.375×10^{-6}

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Short Answer

5.

1. CaF_2 is dissolved in a solution of pure water.

   a. Write the reaction for the dissolving of CaF_2 and the equilibrium expression (Mass action expression). **(#11-1)** $CaF_2 \rightleftharpoons Ca^{+2} + 2F^- \quad K_{sp} = [Ca^{+2}][F^-]^2$

   b. As some CaF_2 is being dissolved a saturated solution is formed. The concentration of the F^{-1} is .07M. What is the molar solubility of the Ca^{2+} ion? **(#11-2b)** 1:2 ratio $0.07/2 = .035$

   c. Determine the Ksp for CaF_2 (Using the information in "c"). **(#11-2a)** $[.035][.07]^2 = 1.7E-4$

   d. If the Ca^{2+} ions and the F^- ions came from different sources, how much Ca^{2+} (mol/L) would be needed to create a saturated solution if the concentration of F^- is .050M to create a saturated solution. (Use Ksp calculated from part "d") **(#11-2b)** $1.7E-4 = [Ca^{2+}][0.05]^2$ $[Ca^{2+}] = 0.068\ M$

6. *A mixture of 5.000 x 10-3 mol of H_2 and 1.000 x 10-2 mol of I_2 is placed in a 5.000 L container at 448C and allowed to come to equilibrium. Analysis of the equilibrium mixture shows that the concentration of HI is 1.87 x 10-3 M. Calculate K_c at 448C for the reaction: $H_2(g) + I_2(g) \Leftrightarrow 2HI(g)$.*

$1.0E-3/5 = .5E-2$ $5.0E-3/5 = 1E-3$

	$H_2(g)$	+	$I_2(g)$	$\Leftrightarrow$	$2HI(g)$
I	$1.0E-3$		$.5E-2$		0
C	$-x$		$-x$		$+2x$
E	$6.5E-5$		$4.0E-3$		$1.87E-3$

$1.0E-3 - 9.35E-4 = 6.5E-5$ $.5E-2 - 9.35E-4 = 4.0E-3$

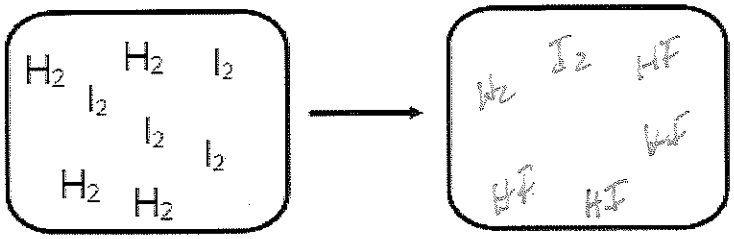
$2x = 1.87E-3$ $x = 9.35E-4$ (0.000935)

$K_c = \frac{[1.87E-3]^2}{[6.5E-5][4.0E-3]} = 13$

a) Write out the equilibrium expression for Kc. (#11-1)

b) Determine the value of the equilibrium constant Kc? **(#11-2c)**

c) Provided below is a model of the initial products for the reaction above. Using your K value create a model of the products. (#11-1)



a) $K_c = \frac{[HI]^2}{[H_2][I_2]}$

$H_2 + I_2 \rightarrow 2HI$

	3	3	0
	-2	-2	+4
	1	1	4