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

Practice Quiz Q7 Equilibrium Q vs K (#11-3a 3b)

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

____ 1. (#11-3b)

$$\text{Energy} + X(s) + 2Y(aq) \Leftrightarrow 3Z(g) + W(l) \quad Kc = 10$$

A chemical company is in the business of selling "Z". After running the chemical reaction for a while under specific conditions the amount of Z in production is stagnant. What changes might increase the amount of Z produced?

I. Increasing the temperature. →
II. Adding more X. X No
III. Increasing the size of the rigid reaction vessel. Vol ↑ Pres ↓ ← No

a. I only
b. I and III only
c. II only
d. I, II, and III

____ 2. (#11-3b)

$$\text{Energy} + X(s) + 2Y(aq) \Leftrightarrow 3Z(g) + W(l) \quad Kc = 10$$

A chemical company is in the business of selling "Z". W is a toxic by product that costs the company money to dispose of in an environmentally friendly manner. Which of the following statements is <u>False</u> relative to the reaction under various conditions.

a. A catalyst will not have an affect on quanity of W produced..
b. When the concentration of W remains constant the reaction has reached equilibrium.
c. Reducing X will have no effect on the production of W.
d. Increasing the pressure of Z at equilibrium will reduce *<u>quantity</u>* of W produced.

____ 3.

$$A(s) + B(aq) \Leftrightarrow C(aq) + D(s)$$

(#11-3a) A 1L reaction vessel contains 2 moles each reactant and 1 mole of each product. Which of the following is true.

I. Given enough time, [C] will exceed [B] No, we don't Know the Kvalue.
II. The reaction is proceeding toward the products to attain equilibrium. Dont Know for sure
III. The reaction quotient is 0.5 No Y

a. I only
b. II and III
c. III only
d. I, II, and III

$\frac{[B]}{[C]} = \frac{2}{2} = 1$ $\frac{[C]}{[B]}$ $\frac{1}{2} = .5$

Name: _____ ID: A

Short Answer

4.

Sodium hydroxide is mixed with iron (III) nitrate forming solid iron (III) hydroxide

1. For the solubility reaction please indicate the following

a) Net ionic equation (#7-2b1) $3OH^- + Fe^{+3} \rightleftharpoons Fe(OH)_3$

or $Fe(OH)_3 \rightleftharpoons Fe^{+3} + 3OH^-$

2. If the previous mixture was of a 100 mL of .01M Sodium hydroxide and 100 mL of .05M Iron (III) nitrate. Answer the following questions. $K_{sp(Fe(OH)3)} = 8E\text{-}16$

a) Write the Ksp expression(#11-2) $K_{sp} = [Fe^{3+}][OH^-]^3$

b) Determine the concentration of each ion after the solutions are **mixed** before equilibrium has been established. (#7-2c) $m_1V_1 = m_2V_2$ or volumes doubled = ½ Conc.

c) Determine Q. (#11-4a)

d) Indicate if a precipitation will occur. Justify. (#11-4a)

$OH^- = 0.005\,M$

$Fe^{+3} = 0.025M$

c) $[.005]^3[0.025] = 3.125E\text{-}9$

d) $Q > K$

$Q \downarrow$

$\frac{P}{R^2}$ ← yes, precipitate

3. energy + A(g) + B(g) = C(g) + D(s)

Given the following reaction at equilibrium in a closed container at 500C, predict the effect of each of the following changes on the concentration of C present at equilibrium.

a) Reducing the volume? (#11-4b)

b) Addition of D (#11-4b)

c) Indicate one way to increase the value of K? (#11-4b)

a) ↓Vol ⇒ ↑P - reduce P ⟶ C↑

b) No change

c) ↑Temp.