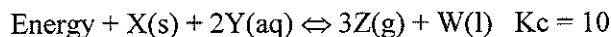


**Practice Quiz Q7 Equilibrium Q vs K (#11-3a 3b)**

**Multiple Choice**

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

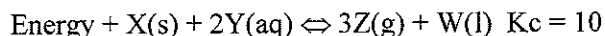
\_\_\_\_\_ 1. (#11-3b)



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. ~~no~~ **yes**
  - II. Adding more X. ~~yes~~ **no**
  - III. Increasing the size of the rigid reaction vessel. ~~yes~~ **no**
- a. I only                      c. II only  
b. I and III only              d. I, II, and III

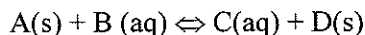
\_\_\_\_\_ 2. (#11-3b)



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 False relative to the reaction under various conditions.

- a. A catalyst will not have an affect on quantity 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 quantity of W produced.

\_\_\_\_\_ 3.



(#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 K value.**
  - II. The reaction is proceeding toward the products to attain equilibrium. **Don't know for sure**
  - III. The reaction quotient is 0.5 **no**
- a. I only                      **c. III only**  
b. II and III                      d. I, II, and III

~~$$\frac{[C]}{[B]} = \frac{1}{2} = 0.5$$~~

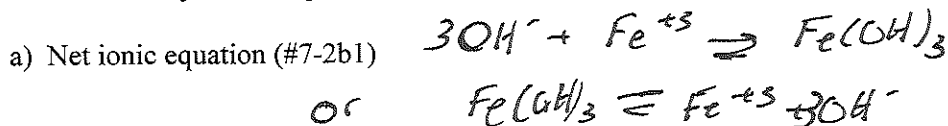
$$\frac{[C]}{[B]} = \frac{1}{2} = 0.5$$

## 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



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.  $K_{sp}(\text{Fe}(\text{OH})_3) = 8\text{E}-16$

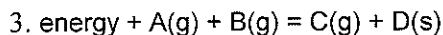
- a) Write the Ksp expression (#11-2)  $K_{sp} = \frac{[\text{Fe}^{3+}][\text{OH}^-]^3}{}$   
 b) Determine the concentration of each ion after the solutions are **mixed** before equilibrium has been established. (#7-2c)  $m_1v_1 = m_2v_2$  or *values diluted = 1/2 conc.*  
 c) Determine Q. (#11-4a)  
 d) Indicate if a precipitation will occur. Justify. (#11-4a)

$$\text{OH}^- = 0.005\text{M}$$

$$\text{Fe}^{+3} = 0.025\text{M}$$

$$c) [0.005]^3 [0.025] = 3.125\text{E}-9$$

d)  $Q > K$   
 $Q \downarrow$   
 $\frac{P}{R} \downarrow$   $\leftarrow$  yes, precipitate



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)  $\downarrow \text{Vol} \Rightarrow \uparrow P$  - reduce P  $\rightarrow$  C  $\uparrow$   
 b) No change  
 c)  $\uparrow$  Temp.