

CH102 // Spring 2019 Thursday
Discussion Quiz #5

Name: _____

TF: _____

Time: _____

1. (1 points) If $K=10^2$ what must be true? (Circle all that apply.)
 - a. The reaction will be spontaneous.
 - b. The reaction will be nonspontaneous.
 - c. The reaction is at equilibrium.
 - d. Reactants are favored at equilibrium.
 - e. **Products are favored at equilibrium. 1 point R or W**
 - f. Reactants and products are equally favored at equilibrium.
 - g. Currently, the reaction has more products than reactants.
 - h. Currently, the reaction has more reactants than products.
2. (3 points) If $K=10^2$ and $Q=10^{-13}$ what must be true? (Circle all that apply.) 1 point each correct one
 - a. **The reaction will be spontaneous. 1 point R or W**
 - b. The reaction will be nonspontaneous.
 - c. The reaction is at equilibrium.
 - d. Reactants are favored at equilibrium.
 - e. **Products are favored at equilibrium. 1 point R or W**
 - f. Reactants and products are equally favored at equilibrium.
 - g. Currently, the reaction has more products than reactants.
 - h. **Currently, the reaction has more reactants than products. 1 point R or W**
3. (2 points) The equilibrium constant for $A(g) + B(g) \rightleftharpoons C(aq)$ is K_1 . After the mixture comes to equilibrium, enough C is added to double the amount of C present. Circle all that must be true immediately after C is added.

K has increased **K stayed the same** K has decreased K has doubled
 Q has increased Q stayed the same Q has decreased $Q = K/2$
 $Q = 2K$ 1 point and another point if the other 2 correct

4. (2 points) The mixture is allowed to come to equilibrium. If the volume of the container is then doubled, circle below all that must be true immediately after the volume is changed.

K has increased **K stayed the same** K has decreased K has doubled
 Q has increased Q stayed the same Q has decreased $Q = K/4$
 $Q = 4K$ 1 point and another point if the other 2 correct

5. (2 point) The equilibrium constant for $D(aq) + \frac{1}{2} B(g) \rightleftharpoons A(g) + E(aq)$ is K_2 . Write an expression, in terms of K_1 and K_2 , for the equilibrium constant, K , for the reaction: $2 E(aq) + 3 A(g) \rightleftharpoons 2D(aq) + C(aq)$.

$$K = \frac{K_1}{K_2^2} \quad 2 \text{ point R or W}$$

Friday:

(1 points) If $K=10^{-13}$ what must be true? (Circle all that apply.)

- a. The reaction will be spontaneous.
- b. The reaction will be nonspontaneous.
- c. The reaction is at equilibrium.
- d. Reactants are favored at equilibrium. 1 point R or W**
- e. Products are favored at equilibrium.
- f. Reactants and products are equally favored at equilibrium.
- g. Currently, the reaction has more products than reactants.
- h. Currently, the reaction has more reactants than products.

2. (3 points) If $K=10^{-13}$ and $Q=10^3$ what must be true? (Circle all that apply.)

- a. The reaction will be spontaneous.
- b. The reaction will be nonspontaneous. 1 point R or W**
- c. The reaction is at equilibrium.
- d. Reactants are favored at equilibrium. 1 point R or W**
- e. Products are favored at equilibrium.
- f. Reactants and products are equally favored at equilibrium.
- g. Currently, the reaction has more products than reactants. 1 point R or W**
- h. Currently, the reaction has more reactants than products.

3. (2 points) The equilibrium constant for $C(aq) \rightleftharpoons A(g) + B(g)$ is K_1 . After the mixture comes to equilibrium, enough C is added to double the amount of C present. Circle all that must be true immediately after C is added.

K has increased

K stayed the same

K has decreased

K has doubled

Q has increased

Q stayed the same

Q has decreased

$Q = K/2$ 1 point R or W

Another point if the other 2 correct

$$Q = 2K$$

4. (2 points) The mixture is allowed to come to equilibrium. If the volume of the container is then doubled, circle below all that must be true immediately after the volume is changed.

K has increased

K stayed the same

K has decreased

K has doubled

Q has increased

Q stayed the same

Q has decreased

$Q = K/4$ 1 point R or W

$$Q = 4K$$

Another point if the other 2 correct

5. (2 point) The equilibrium constant for $D(aq) + \frac{1}{2} B(g) \rightleftharpoons A(g) + E(aq)$ is K_2 . Write an expression, in terms of K_1 and K_2 , for the equilibrium constant, K , for the reaction: $2 E(aq) + 3 A(g) \rightleftharpoons 2D(aq) + C(aq)$.

$$K = \frac{1}{K_1 \times K_2^2} \text{ **2 point R or W**}$$