

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: $2 E(aq) + 3 A(g) \rightleftharpoons 2D(aq) + C(aq)$.

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

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: $2 E(aq) + 3 A(g) \rightleftharpoons 2D(aq) + C(aq)$.

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