

CHEMICAL EQUILIBRIUM

Name ----- date----- group -----

1. $\text{Q} - \text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g}) + \text{Q}$. If the temperature of a gas mixture is increased, in which direction the equilibrium will shift?

- a. From left to right
- b. From right to left
- c. No change

2. $\text{CO}(\text{g}) + 2\text{H}_2(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g})$. If the pressure of a gas mixture is increased, in which direction the equilibrium will shift?

- a. From left to right
- b. From right to left
- c. No change

3. $\text{CO}(\text{g}) + 2\text{H}_2(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g})$. If the concentration of a gas CO increased, in which direction the equilibrium will shift?

- a. from left to right
- b. from right to left
- c. no change

4. $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$. If the concentration of a gas NO increased, in which direction the equilibrium will shift?

- a. from left to right
- b. from right to left
- c. no change

5. Which of the following does not affect chemical equilibrium?

- a. concentration
- b. temperature
- c. volume
- d. pressure

6. Express Equilibrium Constant for reaction: $\text{N}_2(g) + 3\text{H}_2(g) \rightleftharpoons 2\text{NH}_3(g)$:

- a. $K_e = [\text{NH}_3] / [\text{N}_2] [\text{H}_2]^2$
- b. $K_e = [\text{NH}_3]^2 / [\text{N}_2] [\text{H}_2]^3$
- c. $K_e = [\text{NH}_3]^2 / [\text{N}_2] [\text{H}_2]$
- d. $K_e = [\text{NH}_3] / [\text{N}_2] [\text{H}_2]$

7. Express Equilibrium Constant for reaction: $\text{Fe}_3\text{O}_4(s) + 4\text{H}_2 \rightleftharpoons 3\text{Fe}(s) + 4\text{H}_2\text{O}$

- a. $K_e = [\text{H}_2\text{O}]^4 / [\text{H}_2]^4$
- b. $K_e = [\text{Fe}] [\text{H}_2\text{O}] / [\text{H}_2]^4$
- c. $K_e = [\text{Fe}]^3 [\text{H}_2\text{O}] / [\text{H}_2]^4$
- d. $K_e = [\text{H}_2\text{O}] / [\text{H}_2]^4 [\text{Fe}_3\text{O}_4]^3$

8. Equilibrium constant equals:

- a. equilibrium concentration of products divided by equilibrium concentration of reactants
- b. concentration of products multiply by equilibrium of reactants
- c. sum of concentration of products and concentration of reactants

9. Which reaction corresponds to the given formula: $K_e = [\text{NO}_2]^2 / [\text{NO}]^2 [\text{O}_2]$

- a. $\text{N}_2 + \text{O}_2 \leftrightarrow 2\text{NO}$
- b. $2\text{NO} + \text{O}_2 \leftrightarrow 2\text{NO}_2$
- c. $2\text{NO}_2 + \text{H}_2\text{O} \leftrightarrow \text{HNO}_2 + \text{HNO}_3$
- d. $\text{N}_2\text{O}_4 \leftrightarrow 2\text{NO}_2$

10. Which reaction corresponds to the given formula: $K_e = [\text{NO}_2]^2 / [\text{N}_2\text{O}_4]$

- a. $\text{N}_2 + \text{O}_2 \leftrightarrow 2\text{NO}$
- b. $2\text{NO} + \text{O}_2 \leftrightarrow 2\text{NO}_2$
- c. $2\text{NO}_2 + \text{H}_2\text{O} \leftrightarrow \text{HNO}_2 + \text{HNO}_3$
- d. $\text{N}_2\text{O}_4 \leftrightarrow 2\text{NO}_2$

ANSWERS:

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|---|---|---|---|---|---|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| b | a | a | b | c | b | a | a | b | d |

PETRIASHVILI 2021