

Equilibrium Practice Test # 2

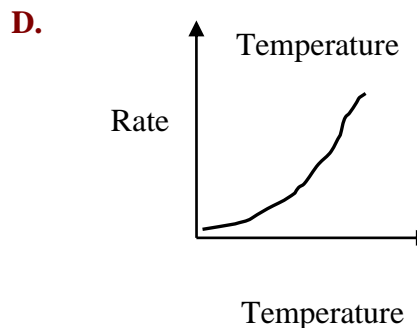
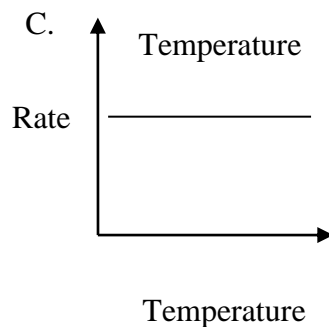
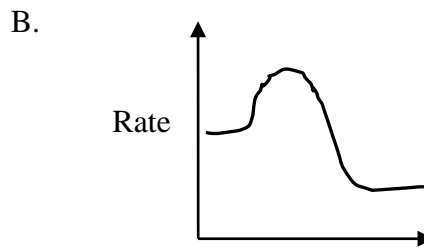
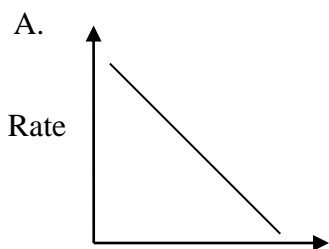
1. The slowest of the following reactions is:

- A. $\text{Ag}^+_{(\text{aq})} + \text{Cl}^-_{(\text{aq})} \rightarrow \text{AgCl}_{(\text{s})}$
- B. $\text{H}^+_{(\text{aq})} + \text{OH}^-_{(\text{aq})} \rightarrow 2\text{H}_2\text{O}_{(\text{l})}$
- C. $3\text{Ba}^{2+}_{(\text{aq})} + 2\text{PO}_4^{3-}_{(\text{aq})} \rightarrow \text{Ba}_3(\text{PO}_4)_2_{(\text{aq})}$
- D. $\text{Cu}_{(\text{s})} + 2\text{Ag}^+_{(\text{aq})} \rightarrow \text{Cu}^{2+}_{(\text{aq})} + 2\text{Ag}_{(\text{s})}$**

2. The rate of a chemical reaction is equal to the slope of the line with axes labelled

- | | x-axis | y-axis |
|-----------|---------------|----------------------|
| A. | time | rate |
| B. | mass | time |
| C. | volume of gas | time |
| D. | time | concentration |

3. Consider the following reaction: $\text{CH}_{4(\text{g})} + 2\text{O}_{2(\text{g})} \rightarrow \text{CO}_{2(\text{g})} + 2\text{H}_2\text{O}_{(\text{g})} + \text{heat}$
The diagram that represents the relationship between rate and temperature is:



4. Which of the following describes the energy of colliding particles as reacting molecules approach each other?

KE

PE

- A. **decreases** **increases**
- B. increases decreases
- C. decreases remains constant
- D. remains constant increases

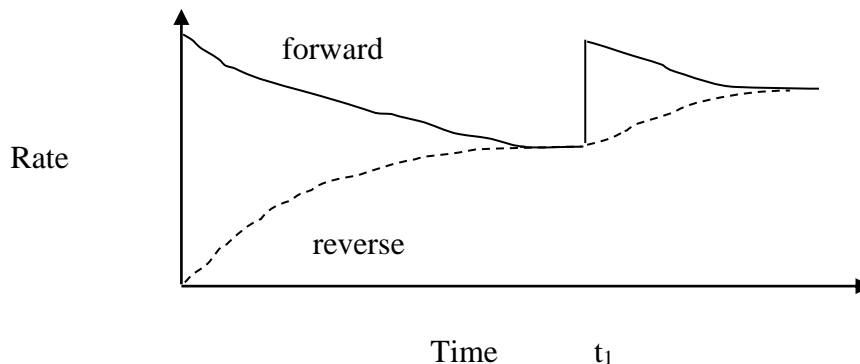
5. The average kinetic energy per molecule can be increased by

- A. adding a catalyst
- B. increasing pressure
- C. increasing temperature**
- D. increasing reactant concentration

6. Consider the following reaction: $C_{(s)} + 2H_{2(g)} \rightleftharpoons CH_{4(g)}$ $\Delta H = -74.8 \text{ kJ}$
Which of the following will cause an increase in the value of the K_{eq} ?

- A. increasing $[H_2]$
- B. decreasing the volume
- C. finely powdering the $C_{(s)}$
- D. decreasing the temperature**

8. Consider the rate diagram for the following reaction: $2HI_{(g)} \rightleftharpoons H_{2(g)} + I_{2(g)}$



Which of the following occurs at t_1 ?

- A. addition of H_2
- B. addition of HI**
- C. addition of a catalyst
- D. a decrease in volume

9. Chemical equilibrium is said to be dynamic because

- A. the reaction proceeds quickly
- B. the mass of the reactants is decreasing
- C. the macroscopic properties are constant
- D. both forward and reverse rates are occurring**

10. Which equation has the largest value of K_{eq} ?

- A. $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ $\Delta H = 21 \text{ kJ}$
B. $C_2H_{6(g)} \rightleftharpoons 2C_{(s)} + 3H_{2(g)}$ $\Delta H = 83 \text{ kJ}$
C. $H_{2(g)} + 1/2O_{2(g)} \rightleftharpoons H_2O_{(g)}$ $\Delta H = -240 \text{ kJ}$
D. $Ca_{(s)} + 3H_2O_{(l)} \rightleftharpoons Ca(OH)_{2(aq)} + H_{2(g)}$ $\Delta H = -240 \text{ kJ}$

11. The value of the K_{eq} can be changed by

- A. adding a catalyst
B. changing the temperature
C. changing the reactant concentration
D. changing the volume of the container

12. Consider the following equilibrium: $PCl_{3(g)} + Cl_{2(g)} \rightleftharpoons PCl_{5(g)}$
When 0.40 mole of PCl_3 and 0.40 mole of Cl_2 are placed in a 1.00 L container and allowed to reach equilibrium, 0.244 mole of PCl_5 are present. From this information, the value of the K_{eq} is

- A. 0.10
B. 0.30
C. 3.3
D. 10

13. Consider the following equilibrium: $PCl_{3(g)} + Cl_{2(g)} \rightleftharpoons PCl_{5(g)}$ $K_{eq} = 2.30$
A 1.0 L container is filled with 0.05 mole PCl_5 , 1.0 mole PCl_3 , and 1.0 mole Cl_2 .
The system proceeds to the

- A. left because the Trial $K_{eq} > K_{eq}$
B. left because the Trial $K_{eq} < K_{eq}$
C. right because the Trial $K_{eq} > K_{eq}$
D. right because the Trial $K_{eq} < K_{eq}$