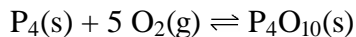


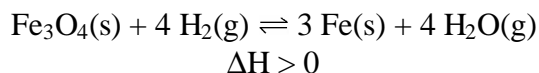
Ch16 • Equilibrium

1999 NChO Exam



33. What is the equilibrium expression for this reaction?

- (A) $K_c = [\text{P}_4\text{O}_{10}] / [\text{P}_4] [\text{O}_2]^5$
- (B) $K_c = [\text{P}_4\text{O}_{10}] / 5 [\text{P}_4] [\text{O}_2]$
- (C) $K_c = [\text{O}_2]^5$
- (D) $K_c = 1 / [\text{O}_2]^5$



34. For this reaction at equilibrium, which changes will increase the quantity of Fe(s)?

1. increasing temperature
2. decreasing temperature
3. adding Fe₃O₄(s)

- (A) 1 only
- (B) 1 and 2 only
- (C) 2 and 3 only
- (D) 1, 2, and 3

1998 NChO Exam

31. Which reaction characteristics are changing by the addition of a catalyst to a reaction to a reaction at constant temperature?

1. activation energy
2. equilibrium concentrations
3. reaction enthalpy

- (A) 1 only
- (B) 3 only
- (C) 1 and 2 only
- (D) 1, 2, and 3

32. Which reaction characteristics will be affected by a change in temperature?

1. value of equilibrium constant
2. equilibrium concentrations

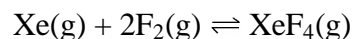
- (A) 1 only
- (B) 2 only
- (C) 1 and 2 only
- (D) neither 1 nor 2

1997 NChO Exam

32. What is the relationship between the equilibrium constant (K_c) of a reaction and the rate constants for the forward (k_f) and backward (k_b) steps?

- (A) $K_c = k_f k_b$
- (B) $K_c = k_b / k_f$
- (C) $K_c = k_f / k_b$
- (D) $K_c = 1 / (k_f k_b)$

33. Xenon tetrafluoride, XeF₄, can be prepared by heating Xe and F₂ together according to this equation.

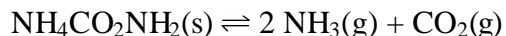


What is the equilibrium expression for this reaction?

- (A) $K = [\text{XeF}_4] / ([\text{Xe}] [\text{F}_2])$
- (B) $K = [\text{XeF}_4] / (2[\text{Xe}] [\text{F}_2])$
- (C) $K = [\text{XeF}_4] / ([\text{Xe}] [\text{F}_2]^2)$
- (D) $K = ([\text{Xe}] [\text{F}_2]) / [\text{XeF}_4]$

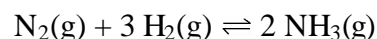
1996 NChO Exam

32. What is the equilibrium expression for the decomposition of ammonium carbamate, NH₄CO₂NH₂, that occurs according to this equation:



- (A) $K = [\text{NH}_3][\text{CO}_2]$
- (B) $K = [\text{NH}_3]^2[\text{CO}_2]$
- (C) $K = [\text{NH}_3][\text{CO}_2] / [\text{NH}_4\text{CO}_2\text{NH}_2]$
- (D) $K = [\text{NH}_3]^2[\text{CO}_2] / [\text{NH}_4\text{CO}_2\text{NH}_2]$

33. Which factors will affect both the position of equilibrium and the value of the equilibrium constant for this reaction? The $\Delta H = -92 \text{ kJ}$



- (A) increasing the volume of the container
- (B) adding N₂
- (C) removing NH₃
- (D) lowering the temperature