Primary Topics of Equilibrium Part 1 Assignment

Watch the following video podcasts and answer each question below:

Primary Topics of Equilibrium Part 1: https://www.youtube.com/watch?v=Gs_BmRbko1s

1) Determine the expression for the equilibrium constant, Kc, for the following reaction.

$$2\ NO\ (g) + O_2\ (g) \leftrightarrow 2\ NO_2\ (g)$$

(A) $Kc = [NO]^2\ [O_2] / [NO_2]^2$

(B) $Kc = [NO_2]^2 / [NO]^2\ [O_2]$

(C) $Kc = 2\ [NO]\ [O_2] / 2\ [NO_2]$

(D) $Kc = 2\ [NO_2] / 2\ [NO]\ [O_2]$

(E) $Kc = [NO] + [O_2] / [NO_2]$

2) Determine the expression for the equilibrium constant, Kp, for the following reaction.

$$2\ NO_2\ (g) \leftrightarrow N_2O_4\ (g)$$

(A) $Kp = P_{N2O4} / P_{NO2}$

(B) $Kp = P_{NO2} / P_{N2O4}$

(C) $Kp = P_{N2O4} / P_{NO2}^2$

(D) $Kp = P_{NO2}^2 / P_{N2O4}$

(E) $Kp = P_{NO2}^2 + P_{N2O4}$

3) Determine the expression for the equilibrium constant, Ka, for a weak acid like $HC_2H_3O_2$.

(A) $Ka = [C_2H_3O_2^-]\ [H_3O^+] / [HC_2H_3O_2]\ [H_2O]$

(B) $Ka = [C_2H_3O_2^-]\ [H_3O^+] / [HC_2H_3O_2]$

(C) $Ka = [HC_2H_3O_2]\ [H_2O] / [C_2H_3O_2^-]\ [H_3O^+]$

(D) $Ka = [HC_2H_3O_2] / [C_2H_3O_2^-]\ [H_3O^+]$

(E) $Ka = [HC_2H_3O_2]$

4) Determine the expression for the equilibrium constant, Ksp, for the following reaction.

$$Fe(OH)_2\ (s) \leftrightarrow Fe^{2+}\ (aq) + 2\ OH^-\ (aq)$$

(A) $Ksp = [Fe^{2+}]\ [OH^-]^2 / [Fe(OH)_2]$

(B) $Ksp = [Fe]\ [OH]$

(C) $Ksp = [Fe][OH]^2$

(D) $Ksp = 1 / [Fe^{2+}]\ [OH^-]^2$

(E) $Ksp = [Fe^{2+}]\ [OH^-]^2$

5) Determine which chemical reaction matches the equilibrium expression below.

$$Ksp = [Ca^{2+}]^3 [PO_4^{3-}]^2$$

(A) $Ca^{2+}(aq) + PO_4^{3-}(aq) \leftrightarrow CaPO_4(s)$

(B) $Ca_3(PO_4)_2(s) \leftrightarrow 3\ Ca^{2+}(aq) + 2\ PO_4^{3-}(aq)$

(C) $Ca(s) + PO_4^{3-}(aq) \leftrightarrow Ca_3PO_4(s)$

(D) $3\ Ca^{2+}(aq) + 2\ PO_4^{3-}(aq) \leftrightarrow Ca_3(PO_4)_2(s)$

(E) $Ca(s) + PO_4(s) \leftrightarrow CaPO_4(s)$