Primary Topics of Equilibrium Part 2 – Vodcast E-Quiz

1) Determine the expression for the equilibrium constant, Kb, for a weak acid like NH_3.

(A) $Kb = [OH^-] [NH_4^+] / [NH_3] [H_2O]$

(B) $Kb = [OH^-] [NH_4^+] / [NH_3]$

(C) $Kb = [NH_3] [H_2O] / [OH^-] [NH_4^+]$

(D) $Kb = [NH_3] / [OH^-] [NH_4^+]$

(E) $Kb = [NH_3]$

2) Calculate the molar concentration of a 0.30 *M* solution of acetic acid, $HC_2H_3O_2$, given the chemical reaction below. Ka for acetic acid is 1.8×10^{-5}.

$$HC_2O_3O_2\ (aq) + H_2O\ (l) \leftrightarrow H_3O^+\ (aq) + C_2H_3O_2^-\ (aq)$$

(A) 0.0010 *M*

(B) 0.0023 *M*

(C) 0.0052 *M*

(D) 0.15 *M*

(E) 0.30 *M*

3) Calculate the concentration, in mol L^{-1}, of IO_4^- (aq) in a saturated solution of $Cu(IO_4)_2$ given the Ksp = 1.40×10^{-7} according to the following reaction.

$$Cu(IO_4)_2\ (s) \leftrightarrow Cu^{2+}\ (aq) + 2\ IO_4^-\ (aq)$$

(A) 0.00132 *M*

(B) 0.00327 *M*

(C) 0.00654 *M*

(D) 0.0131 *M*

(E) 0.0262 *M*

4) Given 0.10 *M* $COCl_2$, what is the equilibrium concentration of CO given Kc = 2.19×10^{-10} according to the following chemical reaction.

$$COCl_2\ (g) \leftrightarrow CO\ (g) + Cl_2\ (g)$$

(A) 4.68×10^{-6} *M*

(B) 9.36×10^{-6} *M*

(C) 1.87×10^{-5} *M*

(D) 3.74×10^{-5} *M*

(E) 7.48×10^{-5} *M*

5) The reaction below has an equilibrium constant Ksp = 7.1×10^{-4}. Calculate the equilibrium concentration of Ca^{2+} (aq).

$$CaCrO_4\ (s) \leftrightarrow Ca^{2+}\ (aq) + CrO_4^{2-}\ (aq)$$

(A) 0.00036 *M*

(B) 0.00071 *M*

(C) 0.013 *M*

(D) 0.027 *M*

(E) 0.054 *M*