Name _____ Period _____

Equilibrium Calculations

1. What is the K_{eq} of formic acid, $HCHO_2$, in water if the equilibrium concentrations are 2.00-M for $[HCHO_2]$ and 6.00×10^{-6} for both $[H_3O^+]$ and $[CHO_2^-]$?

$$HCHO_2(aq) + H_2O(l) \rightleftarrows H_3O^+(aq) + CHO_2^-(aq)$$

Answer: _____

2. What is the K_{eq} of HF in water if the equilibrium concentrations are 6.00 M for [HF] and 0.0634 M for both $[H_3O^+]$ and $[F^-]$?

$$HF(aq) + H_2O(l) \rightleftarrows H_3O^+(aq) + F^-(aq)$$

Answer: _____

3. What is the K_{eq} of H_2SO_3 in water if the equilibrium concentrations are 3.00 M for $[H_2SO_3]$ and 0.219 M for both $[H_3O^+]$ and $[HSO_3^-]$?

$$H_2SO_3(aq) + H_2O(l) \rightleftarrows H_3O^+(aq) + HSO_3^-(aq)$$

Answer: _____

4. Calculate the concentration of OH^- if the equilibrium concentration of NH_2OH in water is 2.55 M.

$$NH_2OH(aq) + H_2O(l) \rightleftarrows NH_3OH^+(aq) + OH^-(aq)$$

$$K_{eq} = 1.10 \times 10^{-8}$$

Answer: _____

5. Calculate the concentration of $C_6H_5NH_3^+$ if the equilibrium concentration of $C_6H_5NH_2$ in water is 3.68 M.

$$C_6H_5NH_2(aq) + H_2O(l) \rightleftarrows C_6H_5NH_3^+(aq) + OH^-(aq)$$

$$K_{eq} = 4.30 \times 10^{-10}$$

Answer: _____

6. Calculate the concentration of HNO_2 in water if the equilibrium concentrations of both H_3O^+ and NO_2^- are 0.0430 M.

$$HNO_2(aq) + H_2O(l) \rightleftarrows H_3O^+(aq) + NO_2^-(aq)$$

$$K_{eq} = 1.10 \times 10^{-8}$$

Answer: _____

7. Calculate the concentration of HBrO in water if the equilibrium concentrations of both H_3O^+ and BrO^- are 6.00×10^{-5} M.

$$HBrO(aq) + H_2O(l) \rightleftarrows H_3O^+(aq) + BrO^-(aq)$$

$$K_{eq} = 2.00 \times 10^{-9}$$

Answer: _____

8. What is the concentration of tin in an equilibrium system of SnS?

$$SnS(s) \rightleftarrows Sn^{2+}(aq) + S^{2-}(aq)$$

$$K_{eq} = 1.00 \times 10^{-25}$$

Answer: _____

9. What is the concentration of Ca^{2+} in an equilibrium system of CaF_2 if $[F^-]$ is 2.20×10^{-3}?

$$CaF_2(s) \rightleftarrows Ca^{2+}(aq) + 2F^-(aq)$$

$$K_{eq} = 5.30 \times 10^{-9}$$

Answer: _____

10. What is the concentration of OH^-, the hydroxide ion, in an equilibrium system of $Cr(OH)_3$ if $[Cr^{3+}]$ is 1.24×10^{-8}?

$$Cr(OH)_3(s) \rightleftarrows Cr^{3+}(aq) + 3OH^-(aq)$$

$$K_{eq} = 6.31 \times 10^{-31}$$

Answer: _____