

CHEM 1423
Chapters 18
Homework Answers

TEXTBOOK HOMEWORK

18.15 Lower $[H^+]$ ∥ higher pH

- (a) $K_a = 4 \times 10^{-5}$: Lower K_a ∥ lower $[H^+]$
- (b) $pK_a = 3.5$: Higher pK_a ∥ lower K_a ∥ lower $[H^+]$
- (c) 0.01 M: lower concentration ∥ lower $[H^+]$
- (d) Weaker Acid: lower $[H^+]$
- (e) 0.01 M Base: Base has lower $[H^+]$
- (f) $pOH = 6$: Has higher pH (8)

18.16 (a) pH = 12.05. Basic
(b) $pOH = 11.13$. Acidic

18.18 (a) $[H^+] = 1.4 \times 10^{-10} \text{ M}$, $[OH^-] = 7.1 \times 10^{-5} \text{ M}$, $pOH = 4.15$
(b) $[H^+] = 2.7 \times 10^{-5} \text{ M}$, $[OH^-] = 3.7 \times 10^{-10} \text{ M}$, $pH = 4.57$

18.20 Must add $1.38 \times 10^{-4} \text{ mol } [OH^-]$

18.45 5.0×10^{-9}

18.48 $[H^+] = [ClCH_2COO^-] = 0.041 \text{ M}$, $[ClCH_2COOH] = 1.21 \text{ M} \approx 1.25 \text{ M}$, $pH = 1.4$

18.50 (a) $[H^+] = 0.006 \text{ M}$, $[OH^-] = 1.7 \times 10^{-12} \text{ M}$, $pH = 2.22$, $pOH = 11.78$
(b) 1.9×10^{-4}

18.54 2.6

18.55 1.5%

18.65 (a) 11.2
(b) 5.6

18.67 10.7

SUPPLEMENTARY HOMEWORK

S1. C

S2. E

S3. A

S4.
$$K_a = \frac{[H^+][SO_4^{2-}]}{[HSO_4^-]}$$

S5. pH = 8.3 , pOH = 5.7 , %Prot = 3.8×10^{-3} %

S6. pH = 2.9 , pOH = 11.1 , %Diss = 1.8%

S7. (a) pH = 1.2 , pOH = 12.8
(b) pH = 10.5 , pOH = 3.5

S8. 6.7×10^{-7}