

17 • The Chemistry of Acids and Bases

pH CALCULATION SITUATIONS

Ch 17

- strong acid solution** – determine $[H^+]$, calculate pH
Calculate the pH of 0.00125M HNO_3
- strong base solution** – determine $[OH^-]$, calculate pOH, calculate pH
Calculate the pH of 0.00125M KOH
- weak acid solution** – determine $[H^+]$ using ICE box, calculate pH
Calculate the pH of 0.00125M $HOCl$ $K_a = 3.5 \times 10^{-8}$
- weak base solution** – determine $[OH^-]$ using ICE box, calculate pOH, calculate pH
Calculate the pH of 0.00125M NH_3 $K_b = 1.8 \times 10^{-5}$
- salt of a weak acid** – write hydrolysis, calc K_b , determine $[OH^-]$ using ICE box, calc pOH, calc pH
Calculate the pH of 0.00125M $NaOCl$
- salt of a weak base** – write hydrolysis, calc K_a , determine $[H^+]$ using ICE box, calc pH
Calculate the pH of 0.00125M NH_4Cl
- diprotic acid solution** – assume all $[H^+]$ from first ionization, determine $[H^+]$ using ICE box, calculate pH
Calculate the pH of 0.00125M H_2CO_3 $K_{a1} = 4.2 \times 10^{-7}$ $K_{a2} = 4.8 \times 10^{-11}$
- mixture of acid and base** – calculate moles of H^+ and OH^- , determine moles of excess H^+ or OH^- , determine total volume, calculate $[H^+]$ or $[OH^-]$, calculate pH
Calculate the pH of 20.0 mL of 0.00125M HNO_3 + 30.0 mL of 0.00125M KOH

For Later...

Ch 18

- pH of a buffer with equal concentrations of donor $[HA]$ and acceptor $[A^-]$**
 $pH = pK_a$ or $pOH = pK_b$
- pH of a buffer with unequal concentrations of donor $[HA]$ and acceptor $[A^-]$**
Henderson-Hasselbach equation

Answers:

1	2	3	4	5	6	7	8
pH = 2.903	pH = 11.097	pH = 5.18	pH = 10.15	pH = 9.28	pH = 6.08	pH = 4.64	pH = 10.398