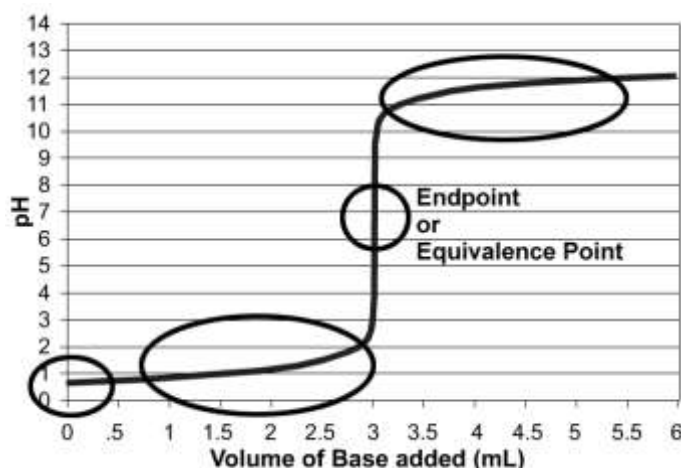


18 • Acid-Base Reactions

STUDY LIST

I can:

- describe how a pH buffer behaves when small amounts of acid or base are added.
- explain why a buffer works (buffering capacity) based on the presence of the weak acid (H^+ donor) and conjugate base (H^+ acceptor). I can show mathematically that diluting the buffer does not change the pH of the buffer; but it reduces its buffering capacity.
- calculate the pH of the best buffer you can make from a given acid and its conjugate base given K_a 's of weak acids (or K_b 's of weak bases)
- choose the acid / conjugate base needed to get a buffer of specified pH. (Given K_a 's of acids.)
- choose pairs of substances that will make a buffer:
 - weak acid & its conjugate base
 - weak base & its conjugate acid
 - or
 - weak base & *some* strong acid
 - weak acid & *some* strong base
- calculate the pH of a buffer using the ICE box or the Henderson-Hasselbach equation.
- solve titration equivalence point problems using $V_{H^+} M_{H^+} = V_{OH^-} M_{OH^-}$.
- explain that at the endpoint of a weak acid titration the solution only contains the conjugate base of the acid. I can calculate the concentration of the conjugate base and the pH at the endpoint of a titration.
- explain that weak acids and strong acids require the same amount of base to be neutralized because the weak acids will dissociate during neutralization.
- determine the equivalence point (end point) of the titration by looking at a titration curve.
- determine the pK_a of the weak acid being titrated by looking at a titration curve.
- do the eight calculations that will allow me to sketch the pH curve for a weak acid or weak base.



- pH of the weak acid solution initially
- amount of based needed for titration
- concentration of conjugate base at endpoint
- pH of the solution at the endpoint
- pH halfway to the equivalence point (e.p.)
- pH a little *before* halfway to the e.p.
- pH a little *after* halfway to the e.p.
- pH after all of the acid has been neutralized

- translate all of my knowledge and skills from a weak acid titration to a weak base titration.