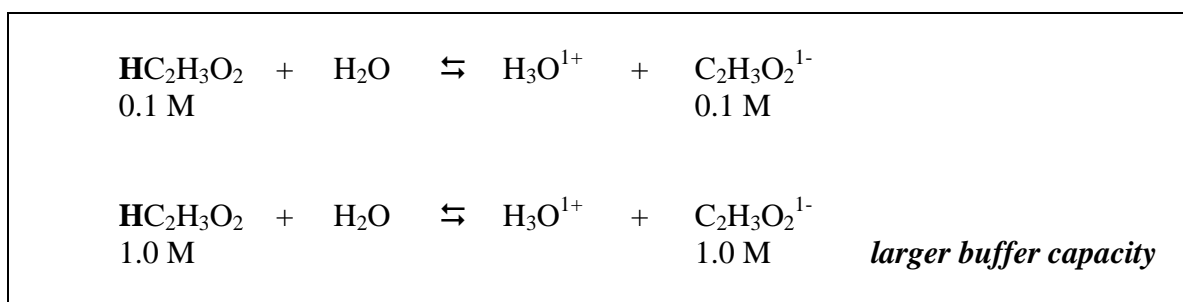


Buffer Capacity:

- Refers to the amount of acid or base that the buffer can neutralize before the pH begins to change.
- Depends on the amount of the weak acid and weak base that are present.



Acid – Base Titrations

Acid	Base	pH at Equivalence Point
Strong	Strong	pH = 7.0
Weak	Strong	pH > 7.0
Strong	Weak	pH < 7.0

Titrations generally involve a HUGE change in pH at the equivalence point.

Equivalence Point:

Perfect stoichiometry between acid and base.

Half-way up the hill for a titration.



0.022 moles

0.022 moles

End Point:

Point where an acid-base indicator changes color. Hopefully, this is NEAR the equivalence point!
Choose an indicator that has a pKa near the predicted pH of a system at the equivalence point.

Example: Phenolphthalein changes colorless to pink at the end point of a titration.

Indicator	pKa	pH Range	Acid Color	Base Color
Methyl Violet	0.8	0.0 – 1.6	Yellow	Blue
Methyl Yellow	3.3	2.9 – 4.0	Red	Yellow
Methyl Orange	4.2	3.1 – 4.4	Red	Yellow
Methyl Red	5.0	4.2 – 6.2	Red	Yellow
Bromothymol Blue	7.1	6.0 – 7.6	Yellow	Blue
Phenolphthalein	9.7	8.0 – 9.8	Colorless	Pink
Thymolphthalein	9.9	9.3 – 10.5	Colorless	Blue
Alizarin Yellow	11.0	10.1 – 12.0	Yellow	Red
Indigo Carmine	12.2	11.4 – 13.0	Blue	Yellow

Reference: James R. Fromm, 1997, www.3rd1000.com/chem301/p00413.htm, Accessed Nov. 2008.

Sample Questions:

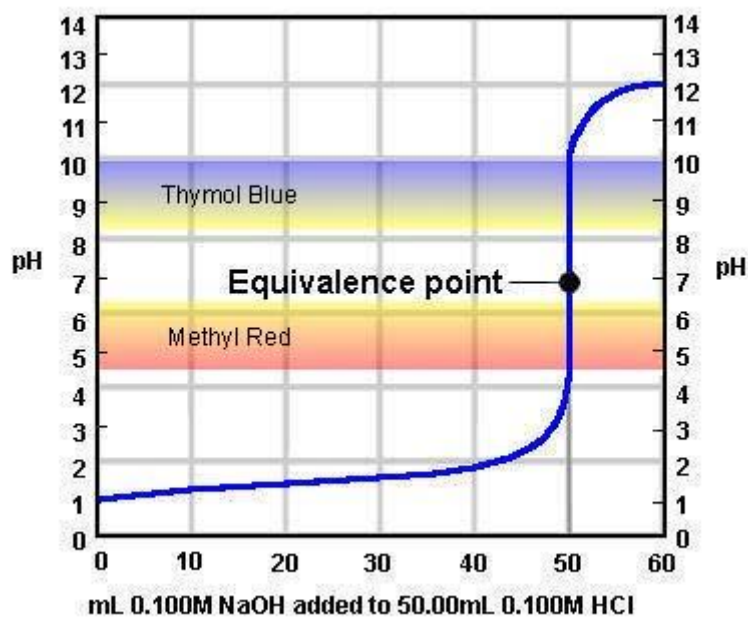
- Which of the indicators listed below is best for an acid-base titration between NH_3 and HCl ?
 - Methyl Yellow
 - Phenolphthalein
 - Alizarin Yellow
 - Indigo Carmine
 - Thymolphthalein

- Which of the indicators listed below is best for an acid-base titration between NaOH and HCl ?
 - Methyl Yellow
 - Bromothymol Blue
 - Alizarin Yellow
 - Indigo Carmine
 - Methyl Violet

- Which of the indicators listed below is best for an acid-base titration between KOH and $\text{HC}_2\text{H}_3\text{O}_2$?
 - Methyl Yellow
 - Methyl Orange
 - Methyl Red
 - Phenolphthalein
 - Methyl Violet

Sample Acid – Base Titration Data

Strong Acid – Strong Base (HCl & NaOH)



Weak Acid – Strong Base ($\text{HC}_2\text{H}_3\text{O}_2$ & NaOH)

