

Review

name the following:

HCl

HClO

HClO₂

HClO₃

HClO₄

Fe(OH)₂

strong acids

write the formulas

nitric acid

nitrous acid

hydronitric acid

magnesium hydroxide

name the following:

HCl hydrochloric acid
 HClO hypochlorous acid
 HClO_2 chlorous acid
 HClO_3 chloric acid
 HClO_4 perchloric acid
 $\text{Fe}(\text{OH})_2$ Iron (II) hydroxide

write the formulas

nitric acid HNO_3
 nitrous acid HNO_2
 hydronitric acid H_3N
 magnesium hydroxide $\text{Mg}(\text{OH})_2$

strong acids

H_2SO_4
 HBr
 HI
 HNO_3
 HClO_4
 HCl

Titration Lab Test

_____ /10 points

Lab technique

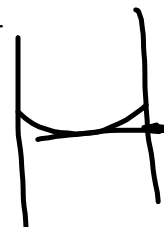
- _____ Rinse Buret with water and current chemical (+1 point)
- _____ Forgot to add phenolphthalein (-1)
- _____ Measure known with graduated cylinder (+1)
- _____ Proper clean up(+1)
- _____ All Data collected (+2)
- _____ Correctly documented calculation (+4)
- _____ Correct answer (+1)

Known 0.05M NaOH (Record known name/concentration.)

- Bring about 50 mL from stock solution back to your lab station.
- Put known in buret.

Unknown _____

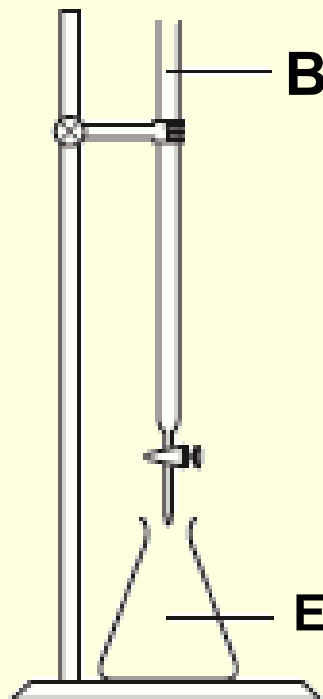
- Goes in beaker below buret
- Use 20 mL of unknown.
- Don't forget to use 3-5 drops of Phenolphthalein.



Data 49.4 + 33.7

Trial 1	Trial 2	Trial 3
Start: <u>0.6 mL - 50 mL</u> Finish: <u>0 mL - 33.7</u> Change: <u>83.1 mL</u> Volume of Unknown = <u>20 mL</u>		
Calculations		

Titration



Buret: contains titrant

- **known concentration**
- **known volume**
(change in volume)

} use to figure out moles

$$M = \frac{\text{moles}}{\text{liters}}$$

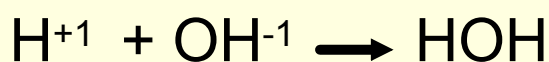
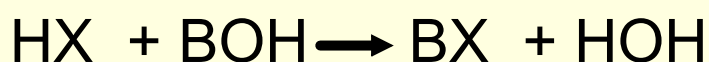
0.81 M HBr
titrate 57mL HBr

E-flask: contains solution to analyze and indicator

- **known volume** 25 mL unknown M base
- **unknown concentration**

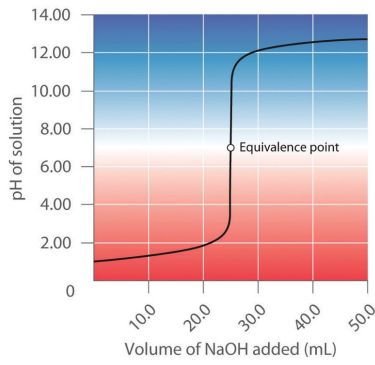
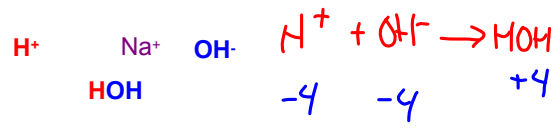
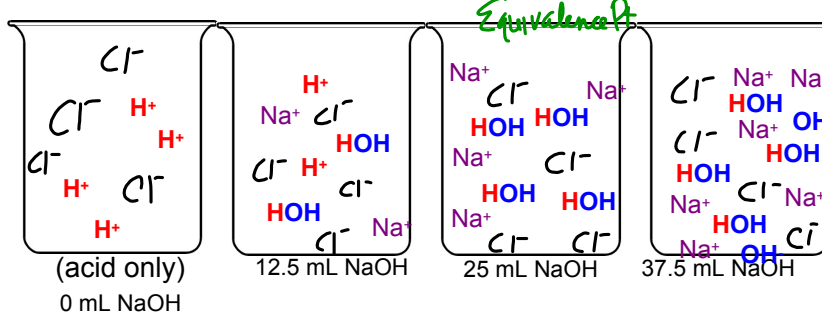
$$\text{moles of base} = \text{moles of acid}$$

use mole and volume to figure out molarity

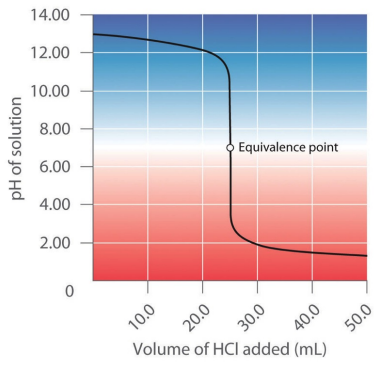


I	2 mol	2 mol	
S	-2	-2	+2
E	0	0	2

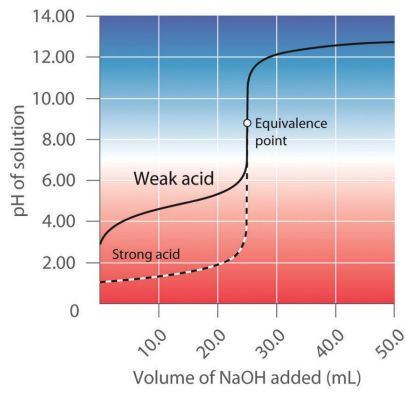
What is happening to the pH as you titrate?



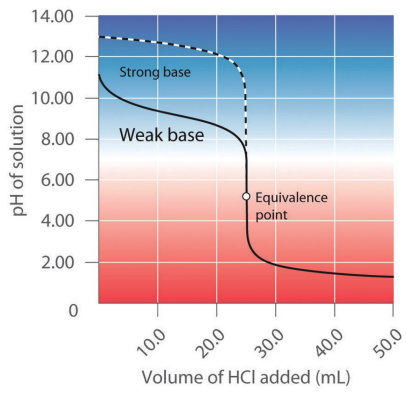
(a) Strong acid titrated with strong base



(b) Strong base titrated with strong acid



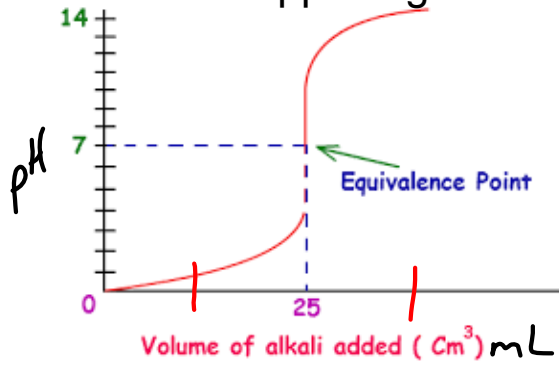
(a) Weak acid titrated with strong base



(b) Weak base titrated with strong acid

New

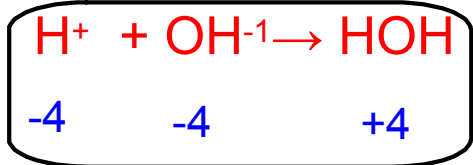
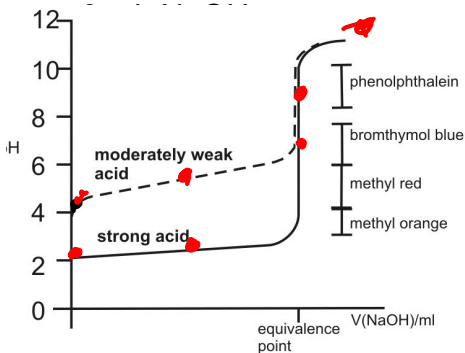
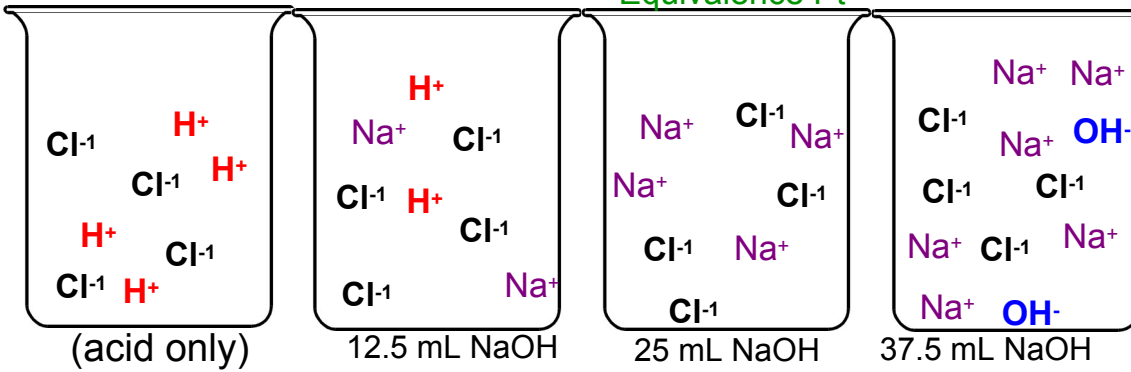
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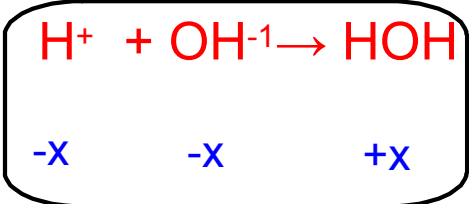
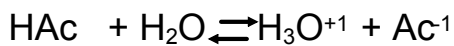
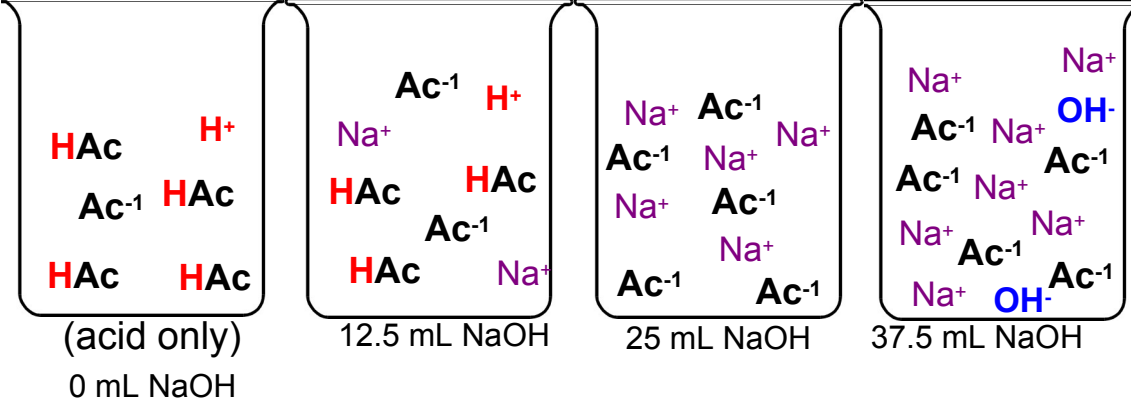
Strong A vs Strong B

↓ Base
□ acid

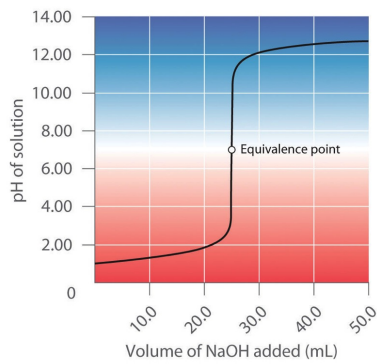
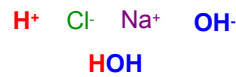
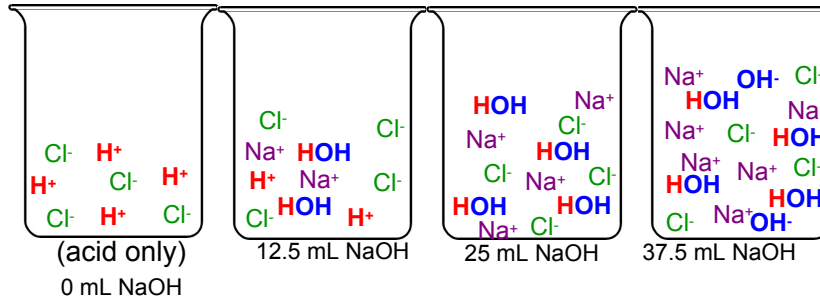
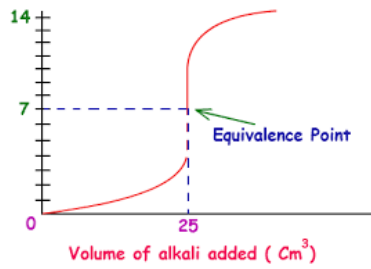
Equivalence Pt



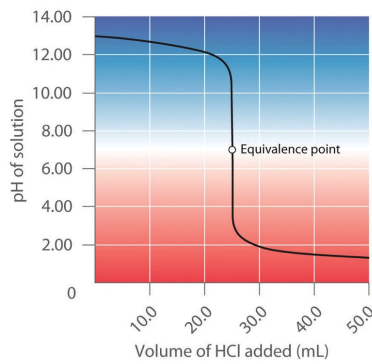
Equivalence Pt



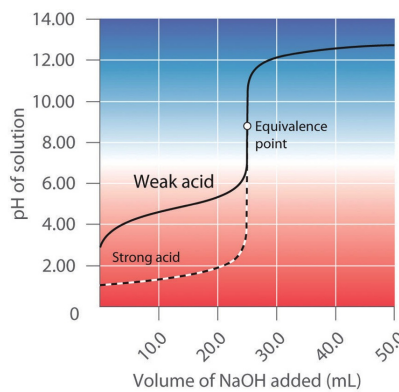
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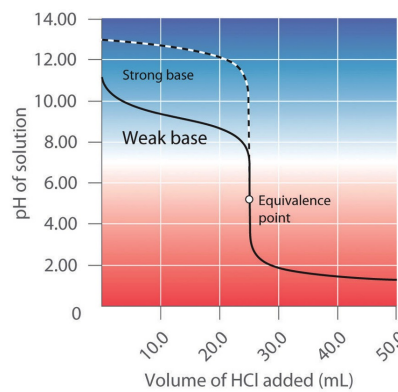
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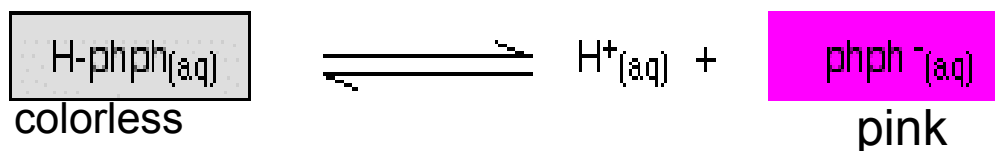
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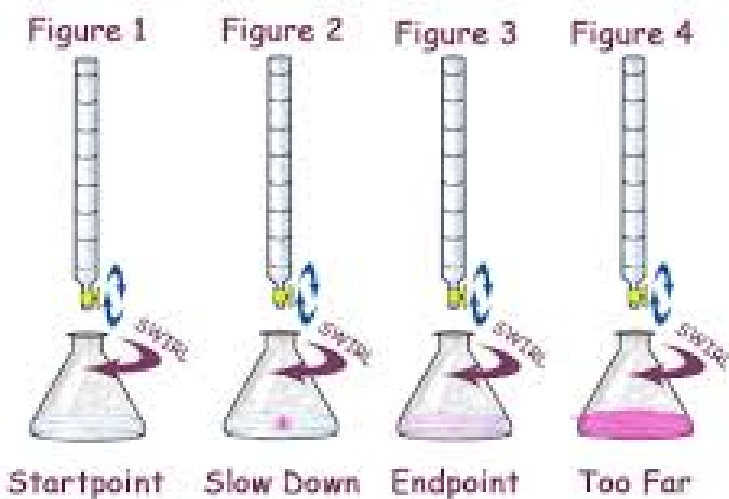
(b) Weak base titrated with strong acid

Phenolphthalein

-- commonly used indicator for titrations and is a very weak acid.



Titration of an Acid with a Base using phenolphthalein indicator



Good Endpoint

Bad Endpoint (Overly Titrated)