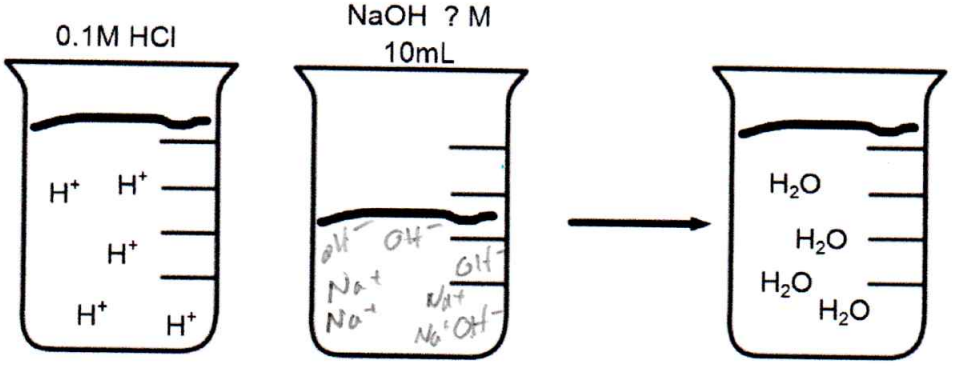
Titration via Particulate Drawings



	known	Unknown
M:	0.1	.01
mol:	.001	.001
Vol:	10 (.01)	(.01)

1. In the beakers above, 10ml of 0.1M HCl is dumped into the beaker with 10mL of NaOH.
   a. How many moles of HCl where added to the NaOH beaker

   $M = mol/L \quad .1 = \frac{x}{.01L} \quad x = 0.001\ mol$

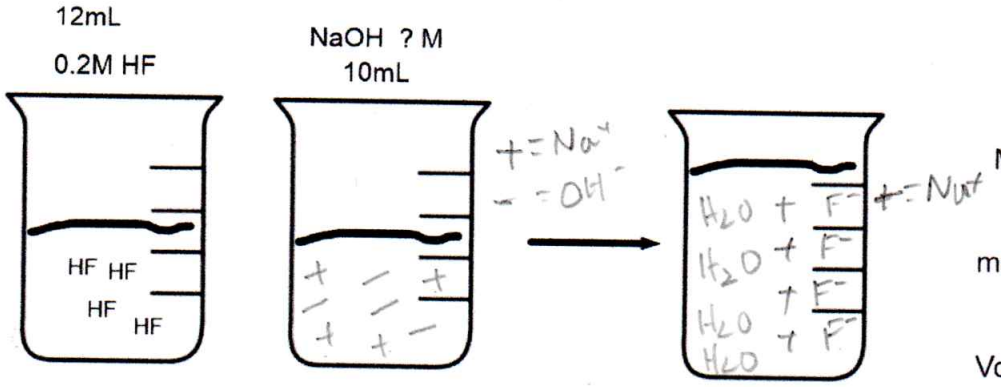
   b. How many moles of NaOH were in the beaker before the neutralization?

   .001 mol

   c. What is the original concentration of the NaOH

   Same as HCl → .001/.01L = 0.1M

   d. Draw the NaOH particles in the beaker above.



	known	Unknown
M:	0.2	0.24
mol:	.0024	.0024
Vol:	.012	.010

2. The beakers above are mixed causing the system to be at the equivalence point.
   a. Complete the known/unknown table showing all work below.

   $M = \frac{mol}{L} \quad 0.2 = \frac{x}{0.012} \quad x = .0024$

   $\frac{.0024}{.01} = .24$

   b. Write a net ionic neutralization reaction. Fill out an ISE table and use the table to draw the pictures for remaining beakers.

   $HF + OH^- \rightarrow H_2O + F^-$

I	4	4		
S	-4	Need -4	+4	+4
E	0			

Draw

Fill in the blanks blow.

3. Phenophthalien is a common chemical Indicator used to indicate changes in pH.
4. Phenophthalien is clear in acids and pink in bases.

5. An unknown base is being titrated with known 0.05M HCl. A graduted cylinder is used to measure 15mL of the unknown and placed in a beaker. The known is placed in a burette, and used to dispense. The student records the start of the burette to be at the 5mL mark on the burette. After adding 2 drops of indicator the unknown turned pink. Known HCl is added until the solution turned clear. The burette read 15mL at this point. Determine the concentration of the unknown, showing work below.

	known	Unknown
M:	0.05	.033
mol:	.0005	.0005
Vol:	10 (.010L)	0.015

$\frac{.05}{1} = \frac{x}{.01}$

$x = 0.0005$

$\frac{.0005}{.015} = 0.033M$

Start: 5
end: 15
10

6. 10mL of NaOH is added to 10mL HCl causing the equivalence point to be reached. What can you postulate about the concentration of the HCl vs. NaOH?

equal moles → Mol / L = M equal conc.
equal volume → L

7. 10mL of NaOH is added to 12mL HCl causing the equivalence point to be reached. What can you postulate about the concentration of the HCl vs. NaOH?

↑ Conc. ← NaOH less volume — same moles — HCl more volume → ↓ Conc.

8. To the right you wil find a QR code for a lab titration. Record down the data for the lab in the tables below and solve for the unknown. Show all work.

watch video

	known	Unknown
start:		
finish:		
change:		
M:		
mol:		
Vol:		