

(#8-7)

TITRATION EXERCISES

For a titration an unknown acid needs to be determined. A 45mL sample is to be examined. This sample is titrated against 0.2M KOH. In the titration, 0.043L of base was required to reach the equivalence.

1. What two things are needed to determine the concentration of the unknown acid?

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

2. From number one what do you have and what do you need?

moles, L is given above

3. What is meant by the term "equivalence point"?

moles equal

4. How many moles of the base were used?

$0.2 = \frac{x}{.043}$ $x = 0.0086$

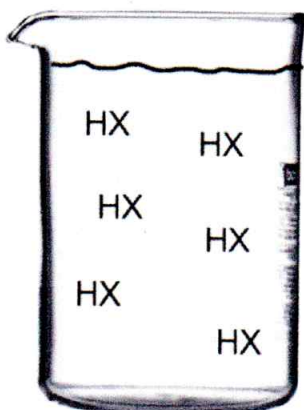
5. During the titration how many moles of acid were neutralized?

0.0086

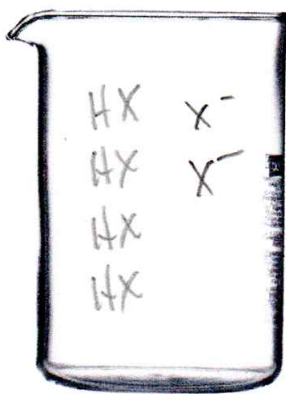
6. What is the concentration of the unknown acid? (Before titration)?

$0.0086 / .045 = 0.19M$

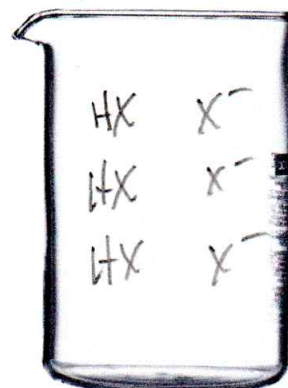
7. Draw the beaker at following points. Zero mL of base added is provided. Mimic concentrations



0 ml added

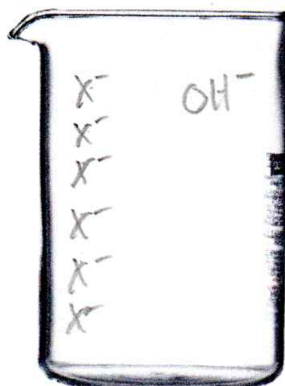
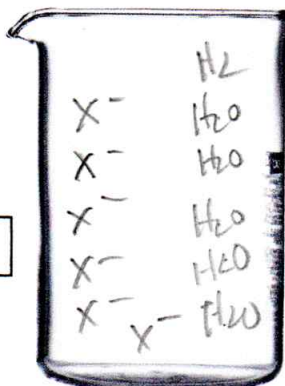


11 ml added

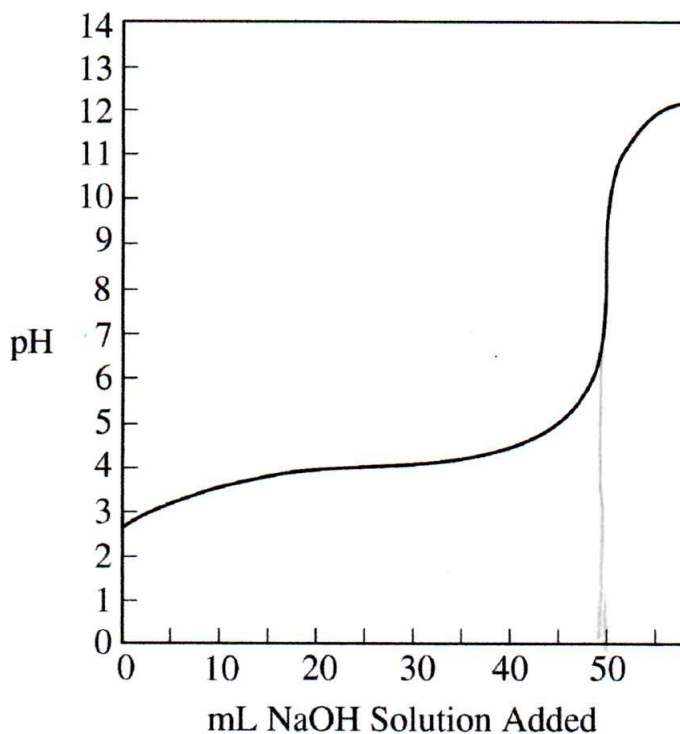


22 ml added

43.5 ml added



50 ml added



	K	HK
M	.1	0.08M
ml	x	x
L	.04	.05
x = .004		

8. In a titration to determine the concentration of an unknown Acid 40 mL of HCl was titrated by 0.10M NaOH.

0.08M

$$\frac{.004}{.05} =$$

9. As you look at the graph, is the acid more or less concentrated than the base? Explain.

less, same moles, larger volume = ↓ conc.

10. How many mL of base are needed to reach equivalence?

50

11. What is the approximate pH of the equivalence?

- close, but slightly less

12. Why isn't the equivalence point exactly neutral?

13. What is the concentration of unknown?

0.08M see work above

14. If 20 ml of 0.1M HCl is mixed with 0.05M NaOH how many mL are needed to reach equivalence?

40, 1/2 conc. need 2x vol

15. If 20mL of .1M HF is mixed with .01M NaOH how many mL of needed to reach equivalence?

200

a. ~~Will the pH be acidic basic or neutral at equivalence?~~

b. What will be the salt present at equivalence? NaF