

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### KHP/Base Titration

Objective: To use a standardized acid to determine the concentration of a base solution.

Equipment:

buret	buret clamp	ring stand	stir plate
magnetic stir bar	Erlenmeyer flasks	balance	

Materials:

Acid: KHP

Base: NaOH

phenolphthalein

distilled water

Procedure:

1. Thoroughly rinse a buret with distilled water.
2. Obtain a 125 mL Erlenmeyer flask and fill with approximately 100 mL of the base solution.
3. Use the balance to mass no less than 1.00 of KHP in a weighing boat. Transfer to a Erlenmeyer flask and dissolve in 20 mL of distilled water.
4. Place a funnel in the top of a buret. Fill the buret with the base that was previously placed in the Erlenmeyer flask. Make sure the volume is below the "0" and record the volume as "Trial 1 initial volume of base."
5. Position the buret in the clamp.
6. Place a stir plate underneath the stopcock of the buret.
7. Place the Erlenmeyer flask on the stir plate and under the stopcock of the buret.
8. Add three drops of phenolphthalein and a stir bar to the flask.
9. Turn on the stir plate. Allow the magnet to freely turn, but not so much that the solution splashes. Dropwise, slowly add base from the buret into the flask. Allow the base to be added until a faint pink color is obtained. The color **MUST** be permanent. This means that it will not go away after moderate shaking, and remains pink for at least 30 seconds.

**\* IF THE COLOR IS DEEP PURPLE, ASK FOR ASSISTANCE ON WHAT TO DO NEXT!**

10. Record the volume on the base buret as "Trial 1 final volume of base."
11. Discard the solutions and repeat the titration until time is called. Note that the final volumes of trial one will become the initial volumes of trial two. If the burets look like they may run out during the next trial, refill and record the volume of the refilled buret as the initial volume.

Data:

<u>Mass KHP (g)</u>	<u>Vinitial (mL)</u>	<u>Vfinal (mL)</u>
1.25	0.56	14.25
1.12	14.25	27.98
1.18	27.98	41.12
1.35	0.85	15.65
1.28	15.65	30.21
1.19	30.21	43.78

Calculations:

1. Write the balanced equation for this acid/base reaction.

For EACH trial:

2. Determine the volume of base used.
3. Determine the number of moles of acid used.
4. Use the equation to determine the number of moles of base used.
5. Calculate the molarity of the base solution.

After all trials are complete:

6. Perform a Q Test to determine if the outermost piece of data is an outlier. Use a 95% confidence level.
7. Report a final average of all concentrations that remain.

Conclusion:

Comment on anything that may have caused a deviation from the “true value.” Since you do not know what the “true value” is, you will want to report all significant errors and possible errors.