

REGULAR LAB 9c: Micro-scale titration

Aim To determine the molarity (concentration) of white vinegar (ethanoic acid)

Apparatus Reaction plates (24 well), pipets, goggles, piece of white paper, 100 mL beakers, toothpicks

Chemicals White vinegar (ethanoic acid), phenolphthalein, 0.200 M NaOH, distilled water

Method

1. Place the reaction plate on the piece of white paper.
2. Pour small stock solutions of vinegar, sodium hydroxide and distilled water into the 100 mL beakers.
3. Take the pipet and fill it with distilled water and then squeeze it dry.
4. Fill the pipet with some vinegar, squeeze it dry.
5. Transfer 10 drops of vinegar to each of six wells on the reaction plate using the pipet.
6. **Using a different, drawn out thin stem pipet**, add one drop of phenolphthalein indicator to each of the six wells.
7. Squeeze the “vinegar pipet” dry and then rinse it with distilled water.
8. Fill the original “vinegar pipet” with some sodium hydroxide, squeeze it dry.
9. Using the “vinegar pipet” (now the “sodium hydroxide pipet”) add sodium hydroxide to one of the wells, dropwise, with stirring (using the toothpick), until a faint pink color is observed that persists for about thirty seconds. **Record the number of drops required to reach this endpoint.** Repeat this procedure for the other five wells.

Results

Experiment (well) #	# of drops of NaOH used
1	
2	
3	
4	
5	
6	
Average	



Conclusion/Calculation

1. Consider the chemical equation given below (that shows the reaction of ethanoic acid with sodium hydroxide) and calculate the molarity of the ethanoic acid in vinegar.



HINT: moles = (concentration) (volume) and the chemical equation relates moles of the two substances



2. Why is it necessary to use white vinegar rather than vinegar that has been colored brown?
3. Why is it necessary to use only one pipet for the transfer of both the acid and the base (sodium hydroxide)?
4. Describe possible sources of error.