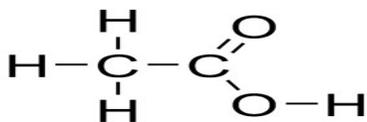


Appendix C - Titration Analysis of Vinegar



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In this investigation, you will be the quality control chemist. You have received a report that a local high-school cafeteria has been serving watered-down vinegar to the students. Your purpose is to test the acetic acid concentration of the vinegar to discover whether it has been diluted. Complete the Analysis and Evaluation sections of the report.

Purpose: What is the molar concentration of acetic acid in a sample of vinegar?

Prediction: The manufacturer claims on the label that the vinegar contains 5.0% acetic acid, which translates into a 0.87 mol/L concentration of acetic acid. The concentration of acetic acid in the vinegar sample should be the same.

Materials:	Lab apron	50mL burette
	Eye protection	10mL volumetric pipette
	NaOH(aq)	pipette bulb
	Vinegar	ring stand
	Phenolphthalein	burette clamp
	Wash bottle of pure water	stirring rod
	Two 100mL or 150mL beakers	small funnel
	250mL beaker	two 250mL Erlenmeyer flask
	100mL volumetric flask with stopper	

- Procedure:**
1. Obtain about 30mL of vinegar in a clean, dry 100mL beaker.
 2. Pipette one 10.00mL portion into a clean 100mL volumetric flask and dilute to the mark.
 3. Stopper and invert several times to mix thoroughly.
 4. Obtain about 70mL of NaOH(aq), in a clean, dry, labeled 100mL beaker.
 5. Set up the burette with NaOH(aq), following the accepted procedure for rinsing and clearing the air bubble.
 6. Pipette a 10.00mL sample of diluted vinegar into a clean Erlenmeyer flask.
 7. Add 1 or 2 drops of phenolphthalein indicator.
 8. Record the initial burette reading to the nearest 0.1mL.
 9. Titrate the sample with NaOH(aq) until a single drop produces a permanent change from colourless to faint pink.
 10. Record the final burette reading to the nearest 0.1mL.
 11. Repeat steps 6 to 10 until three consistent results are obtained.

Analysis: What is the molar concentration of acetic acid in the sample of vinegar?