Acid–Base Titration of an Unknown Sample

Your Name
Course code and laboratory section

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1 Purpose

Determine the concentration of an unknown monoprotic acid by titration with a standard sodium hydroxide solution and assess repeatability.

2 Background

At the equivalence point, the stoichiometric relation is

$$c_{\text{acid}} V_{\text{acid}} = c_{\text{base}} V_{\text{base}}.$$

The endpoint is identified from the indicator colour change. Record whether the final drop was added slowly enough to avoid overshooting.

3 Materials and procedure

List the burette, pipette, conical flask, indicator, standard solution and unknown. Rinse the burette with titrant, perform one rough run, then repeat until two concordant titres are available.

4 Results

Table 1: Titration readings.

Run	Initial (mL)	Final (mL)	Titre (mL)
Rough	0.10	24.90	24.80
1	0.20	24.72	24.52
2	24.72	49.20	24.48
3	49.20	73.70	24.50

5 Calculations

Show one complete substitution with units, calculate the mean concordant titre, and report the concentration to a precision justified by the glassware. Include the uncertainty from the burette and pipette tolerances.

6 Discussion

Explain the concordance criterion, endpoint choice, and any systematic error. Describe one change that would improve the precision without changing the chemistry.

7 Conclusion

- Mean titre: _____
- Unknown concentration: _____
- Dominant uncertainty: _____