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Strong Solution of Ammonium Acetate

Experiment 2 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To prepare ammonium acetate solution by controlled neutralisation and explain how concentration and ingredient strength affect the batch.

Principle

Acetic acid reacts with ammonia to form ammonium acetate: $CH_3COOH + NH_3 \rightarrow CH_3COONH_4$. The neutralisation releases heat. Reagent strength and the prescribed endpoint determine the amount needed; a casual pH check cannot establish the official assay.

Formula Record

Use the college-prescribed IP composition and edition for this preparation. Enter the acetic acid strength, ammonia strength and final amount before compounding; the syllabus gives the preparation name, but no quantitative formula.

Requirements

- Prescribed IP master formula and ingredient assay information.
- Acetic acid, ammonia solution and purified water of the specified grades.
- Balance, measuring cylinder, beaker, stirring rod, thermometer and suitable closed bottle.

Procedure

1. Set the batch

Copy the prescribed ingredient quantities and strengths into a batch worksheet. Scale all quantities together and identify the specified final-volume or final-mass basis.

2. Combine carefully

Use the laboratory ventilation and addition order prescribed for the concentrated reagents. Add gradually with stirring and control the temperature; do not seal a warm reacting mixture.

3. Complete neutralisation

Check the endpoint by the prescribed test. Record reagent amount used and any adjustment rather than assuming equal volumes neutralise each other.

4. Make up and package

Allow the solution to reach the specified measuring temperature. Adjust to final amount, mix and transfer to a compatible, tightly closed bottle.

5. Evaluate

Observe clarity and colour, record pH where required, and distinguish appearance tests from quantitative assay. Label the name, strength, batch and storage specified by the laboratory.

Observations and Record

Check	Expected record	Observation
Formula basis	Master formula and reagent strengths	_____
Appearance	Clear solution; note any particles	_____
Final amount / pH	Measured amount and prescribed pH test	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Illustrative reaction calculation: 0.10 mol of acetic acid needs 0.10 mol of ammonia. Pure masses are approximately 6.01 g acetic acid and 1.70 g ammonia.
- If a master formula is for 1000 mL and the assigned batch is 100 mL, the scale factor is 0.10. Multiply every specified ingredient by 0.10.
- The reaction calculation explains stoichiometry; it does not replace the master formula for strong solution.

Result

Record the observed outcome and calculated value, with units. State whether the stated laboratory specification was met; do not copy the worked example as your result.

Precautions

- Use eye protection and the prescribed ventilation because concentrated acetic acid and ammonia are irritating.
- Do not make the final volume while the solution is warm.
- Keep reagent containers closed when not in use; volatilisation can alter strength.

Viva Questions and Answers

1. Why control temperature?

Neutralisation produces heat, and warm liquid gives an inaccurate final-volume measurement.

2. Why is reagent assay needed?

Commercial acid and ammonia solutions contain variable proportions of active reagent.

3. Does a clear solution prove compliance?

No. Strength and prescribed quality tests still have to be checked.

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