pH and Solvent Effects on UV Spectra

Experiment 3 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To compare the UV spectra of an assigned compound under specified pH and solvent conditions.

Principle

Ionisation and solvation can alter electronic absorption. A valid comparison uses matched concentration, appropriate blanks and a defined wavelength range.

Requirements

- Assigned UV-visible instrument, suitable matched cells, analyte, prescribed solvent/buffer systems and blanks.

Procedure

1. Set the comparison

Record each solvent/pH condition and keep analyte concentration and optical path constant.

2. Blank separately

Use the corresponding solvent/buffer blank and a suitable spectral range for that medium.

3. Scan

Record spectra and locate maxima and selected absorbances without exceeding the validated range.

4. Compare

Tabulate wavelength/absorbance changes, distinguishing wavelength shift from intensity change.

5. Interpret

Relate the pattern to the assigned ionisation or solvent explanation and state any precipitation or baseline limitation.

Observations and Record

Condition	Wavelength maximum	Selected absorbance
Condition 1	_____	_____
Condition 2	_____	_____
Condition 3	_____	_____

Result

Record the completed observations, calculations and conclusion with units. State any limitation of the observation.

Precautions

- Do not attribute concentration or baseline differences to a solvent effect.
- Record actual pH and any turbidity or cell mismatch.

Viva Questions and Answers

1. What is a bathochromic shift?

A shift of absorption to longer wavelength.

2. Why use a separate blank?

Different solvents and buffers contribute different backgrounds.

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