Estimation of Sulphanilamide by Colorimetry

Practical 02 | Instrumental Methods of Analysis and Novel Drug Delivery Systems

Aim

To study Estimation of Sulphanilamide by Colorimetry, and interpret the recorded observations.

Principle

- The assigned colour reaction converts the analyte response into a visible-wavelength measurement. Standards, reagent blank and a controlled colour-development interval establish the calibration.
- An optical response is related to analyte concentration over the validated working range.
- A blank, suitable standards and consistent optical conditions are necessary for interpreting the response.
- Record the colour-reaction sequence demonstrated for this analyte and the wavelength selected.
- Prepare standards and test through the same reaction sequence so reagent and timing effects are comparable.

Materials and Apparatus

- Sulphanilamide standard, assigned colour-reaction system, colorimeter and volumetric apparatus.
- Assigned analyte, suitable reference standard, solvent/reagents and volumetric glassware.
- Specified optical instrument and compatible cells or sample-introduction system.

Method

1. Select the optical method and settings appropriate to the assigned analyte.
2. Prepare a method blank and a series of independently documented calibration concentrations.
3. Check the instrument response and measure the blank and standards using consistent settings.
4. Prepare the test solution and apply documented dilution where necessary.
5. Read the test response within the established calibration range.
6. Calculate concentration, correct for dilution and report the original-material basis.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Standard concentration	_____
Blank/standard response	_____
Colour-development interval	_____
Test absorbance	_____
Dilution	_____

Calculations and Interpretation

- For calibration response y = mC + b: C = (y - b) / m.
- Original concentration = concentration read from calibration × total dilution factor.

Worked Illustration

Illustration: y = 0.050C + 0.010 and y = 0.260 give C = 5.00 in the concentration units used for calibration.

The values in this illustration are for calculation practice.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Use clean compatible cells and consistent orientation where cells are used.
- Keep readings within the calibration range and examine the calibration fit.
- Avoid assuming that another analyte or solvent has the same response factor.

Viva Questions

1. What is the role of a blank?

It corrects the contribution of the solvent, reagents and measurement background.

2. Why use several calibration levels?

They establish the usable response-concentration relationship and help reveal nonlinearity.

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