Estimation of Quinine Sulphate by Fluorimetry

Practical 04 | Instrumental Methods of Analysis and Novel Drug Delivery Systems

Aim

To study Estimation of Quinine Sulphate by Fluorimetry, and interpret the recorded observations.

Principle

- Quinine fluorescence is measured at defined excitation/emission settings and solution conditions. Fluorescence is not interchangeable with absorbance, and pH or matrix effects can change the response.
- 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.
- Keep the solvent, pH, instrument settings and cell arrangement consistent between standards and test.
- Use the working range demonstrated by the calibration; concentrated solutions can show inner-filter or other nonlinear effects.

Materials and Apparatus

- Quinine sulphate standard, assigned solvent, fluorimeter and suitable cells.
- 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	_____
Excitation/emission settings	_____
Blank fluorescence	_____
Test fluorescence	_____
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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