Determination of Sodium by Flame Photometry

Practical 06 | Instrumental Methods of Analysis and Novel Drug Delivery Systems

Aim

To determine Sodium by Flame Photometry, and interpret the recorded observations.

Principle

- Sodium emission is compared with standards at the element-specific instrument setting. Matrix, aspiration and flame conditions influence the analytical 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.
- Record the selected element channel and the instrument calibration.
- Use a suitable blank and consistent matrix/aspiration conditions; a different ion response is not a substitute calibration.

Materials and Apparatus

- Assigned sodium standards and test solution, flame photometer 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	_____
Emission response	_____
Instrument setting	_____
Test response	_____
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.

First Hope

COMPLETE NOTES

Click here to visit our website

PHARMACY PRACTICAL NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Complete subjects and semesters are available in the FirstHope app.