

Atomic Absorption Method Guide

Na in blood serum

Key Words

- Blood Serum
- Sodium
- Flame
- Atomic Emission

Principle

The sample is diluted 1:1000 with deionised water, and sodium is determined by flame atomic emission spectrometry using an air-acetylene flame.

Reagents

Sodium master standard (10.0mM/L)

Dissolve 0.5844g of dry sodium chloride in deionised water, and make up to 1.0 litre with deionised water in a volumetric flask. This solution must be stored in a plastic bottle.

Sodium sub-stock standard (1.0mM/L, dilute 10.0mL of the master standard to 100mL with deionised water)

Working standards

Prepare working standards containing 0.10, 0.12, 0.13, 0.14 and 0.15mM/L of sodium by adding 10.0, 12.0, 13.0, 14.0 and 15.0mL of the sodium sub-stock standard into a series of 100mL volumetric flasks and dilute to volume with deionised water. Use deionised water as the blank solution.

Sample Preparation

Using a micro-pipette, transfer 100µL of the serum sample into a clean, dry 100mL volumetric flask, and make up to volume with deionised water. Ensure that the solution is thoroughly mixed before analysis. 0.15mM/L of sodium in this solution is equivalent to 150mM/L in the original sample.

Instrument Parameters

Na blood (Na)

Measurement Mode: Emission

Number of Resamples: 3

Fast Resamples

Measurement Time: (s) 4.0

Wavelength: (nm) 589.0

Lamp Current: (%) 0

Bandpass: (nm) 0.5

Optimise Spectrometer Parameters

Signal: Continuous

Transient Peak Measurement

Measure From (s): 0.00 To: 4.00

High Resolution

Background Correction: Off

Fluer Rejection

Use Fluer Rejection

Rejection Limit: (%) 95

RSD Test

Use Test

If RSD greater than 0 %

AND signal greater than 0.1 Int

Then Flag and Continue

Na blood (Na)

Flame

Flame Type: Air-Acetylene

Fuel Flow: (L/min) 1.1

Optimise Fuel Flow

Auxiliary Oxidant

Stabilisation

Burner Stabilisation Time: (min) 0

Nebuliser Uptake Time: (s) 4

Burner Height

Burner Height: (mm) 7.0

Optimise Burner Height

Rotate the burner to 90° to the optical axis of the spectrometer to improve the linearity, and use the 0.15mM/L sodium working standard as the optimisation solution to set up the spectrometer.

Figure 1 Instrument parameters

Results

Sample	Reference serum (1)	Reference serum (2)	Reference serum (3)	Reference serum (4)	Reference serum (5)
Sodium found (mM/L)	147	150	132	139	114
Reference value (mM/L)	148	151	131	137	110

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The method of sample treatment described in this publication should be performed only by a competent chemist or technician trained in the use of safe techniques in analytical chemistry. Users should acquaint themselves with particular hazards which may be incurred when toxic materials are being analysed and handled in the instruments, and the instrument must be used in accordance with the operating and safety instructions given in the Operators manual.

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