

Atomic Absorption Method Guide

Zn in Blood Serum

Key Words

- Blood Serum
- Zinc
- Flame
- Atomic Absorption

Principle

The sample is diluted 1:10 with deionised water, and zinc is determined by flame atomic absorption spectrometry using an air-acetylene flame. Sodium is added to standard solutions to match potential background interference effects in the samples.

Reagents

Zinc master standard (1000 mg/L, SpectrosoL or equivalent)

Zinc sub-stock standard (1.0 mg/L, dilute 1.0 mL of the master standard to 1.0 L with deionised water)

Sodium master standard (140 mM/L)

Dissolve 8.2 g of dry sodium chloride (zinc-free) in the minimum necessary quantity of 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.

Working standards

Prepare working standards containing 0, 0.1 and 0.2 mg/L of zinc by adding 0, 10.0 and 20.0 mL of the zinc sub-stock standard into a series of 100 mL volumetric flasks. Add 10 mL of the sodium stock solution to each flask and dilute to volume with deionised water.

Sample Preparation

Using a micro-pipette, transfer 1.00 mL of the serum sample into a clean, dry 10 mL volumetric flask and make up to volume with deionised water. Ensure that the solution is thoroughly mixed before analysis. 0.2 mg/L of zinc in this solution is equivalent to 2.0 mg/L in the original sample.

Instrument Parameters

The screenshot displays two panels of the instrument's software interface. The top panel, titled 'Zn blood [Zn]', contains the following settings: Measurement Mode: Absorption; Number of Resamples: 3; Fast Resamples: checked; Measurement Time: 4.0 s; Wavelength: 213.9 nm; Lamp Current: 75%; Bandpass: 0.5 nm; Optimise Spectrometer Parameters: unchecked; Signal: Continuous; Measure From: 1.00 s; To: 1.00 s; High Resolution: unchecked; Background Correction: D2 Quadline; Flier Rejection: Use Flier Rejection: unchecked; Rejection Limit: 15%; RSD Test: Use Test: unchecked; If RSD greater than: 1%; AND signal greater than: 1 Abs; Then: Tag and Continue. The bottom panel, also titled 'Zn blood [Zn]', contains the following settings: Flame Type: Air-Acetylene; Fuel Flow: 1.0 L/min; Optimise Fuel Flow: unchecked; Auxiliary Oxidant: unchecked; Stabilisation: Burner Stabilisation Time: 0 min; Nebuliser Uptake Time: 4 s; Burner Height: Burner Height: 1.0 mm; Optimise Burner Height: checked.

Figure 1: Instrument parameters

Results

Sample	Reference serum (1)	Reference serum (2)	Reference serum (3)	Reference serum (4)	Reference serum (5)
Zinc found (mg/L)	1.74	0.94	0.88	1.06	0.96
Reference value (mg/L)	1.75	0.93	0.87	1.03	0.98

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www.thermo.com



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