Method Guide: 40501

Atomic Absorption Screening Method Guide Se in Blood Serum

Key Words

- Blood Serum
- Selenium
- Graphite Furnace
- Atomic Absorption
- Rapid Screening Method

Principle

The sample is diluted 1+4 with a special diluent containing 0.1 % m/v Triton X-100 and 1 % v/v nitric acid in deionised water and selenium is determined by Graphite Furnace Atomic Absorption Spectrometry using ELC cuvettes and employing 500 ppm Palladium as a modifier.

Reagents

Concentrated nitric acid (Spectrosol or equivalent)

Triton X-100 (High purity grade or equivalent)

Diluent mixture

Weigh 0.1 gram of Triton X-100 into a 100 mL flask, add about 50 mL deionised water and then transfer 1 mL of concentrated nitric acid into the flask. Dilute to volume with deionised water and mix well.

2 % Pd in 10 % v/v HNO_3 (SPEX CertiPrep or equivalent)

500 ppm Matrix modifier preparation

Transfer 0.5 mL of the Pd master solution to a 20 mL flask. Dilute to volume with deionised water and mix well.

Pooled serum blank standard (Example contained 0 µmol/L Se, certified Sero reference material)

Pooled serum high standard (Example contained 2.6 µmol/L Se, local reference material)

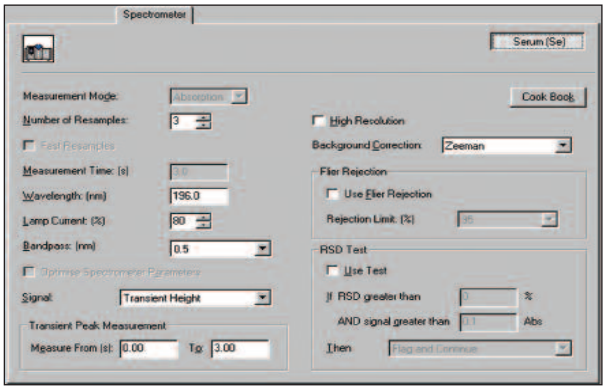
Working standards

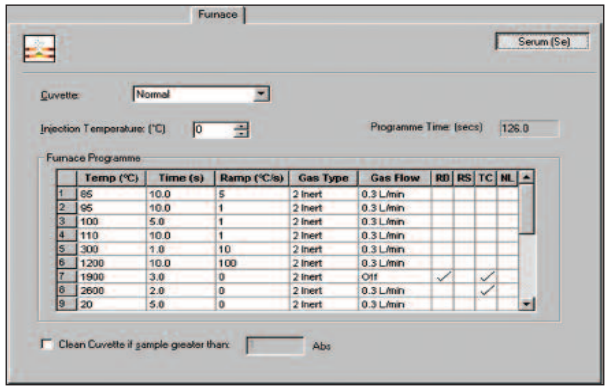
Prepare working blank and top standard by dilution with deionised water, using the same procedure as for samples.

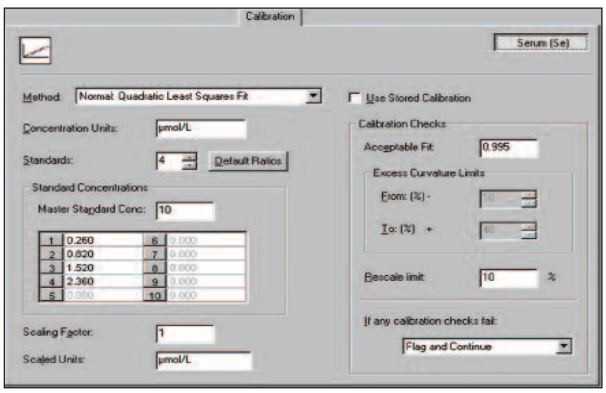
Sample Preparation

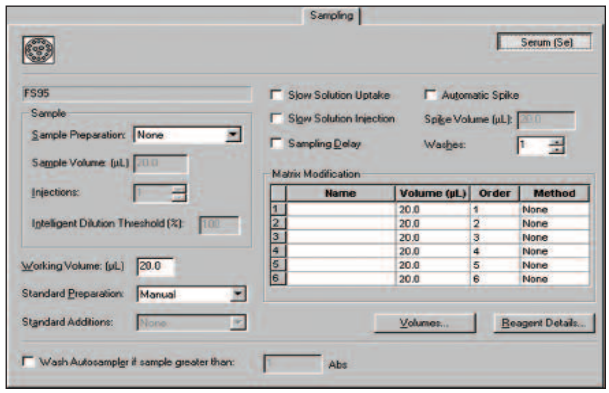
The serum samples were prepared in acid washed tubes immediately before analysis. 200 µL portions of serum were mixed with 800 µL of the special diluent containing 0.1 % m/v Triton X-100 and 1.0 % v/v nitric acid. Ensure that the solution is thoroughly mixed before analysis.

Instrument Parameters









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The use of slow injection into a warmed cuvette minimises the effect of sample viscosity and improves the drying performance.

Background correction using a Zeeman-based system is preferred due to the potential spectral interference from iron (present in any red cells carried over during separation).

Results

Sample	Serum (1)	Serum (2)
Solenium found (µmol/L)	1.02	0.52
Reference value (µmol/L)	1.1 +/- 10%	0.5 +/- 10%

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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