

PSA

Millennium Excalibur

MEASUREMENTS OF ARSENIC, SELENIUM,
ANTIMONY, BISMUTH AND TELLURIUM
with the accuracy of atomic fluorescence



Millennium - [Ver 2.01]

File Analysis Calibration Method Options/Defaults

Measured by:

Method Type:

New Calibration:

Unit:

Slope:

Intercept:

Correlation Coefficient:

Slope %:

Blank Value:

Blank Error:

Blank Error %:

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Least Squares

Calibration 1

ng/ml

43.416073

-1.063191

0.999515

Instrument 1: CALIBRATION

Instrument 2: Method 2: Calibration 1: Results

Instrument 3: Method 3: Calibration 1: Results

Instrument 4: Method 4: Calibration 1: Results

Instrument 5: Method 5: Calibration 1: Results

Instrument 6: Method 6: Calibration 1: Results

Instrument 7: Method 7: Calibration 1: Results

Instrument 8: Method 8: Calibration 1: Results

Instrument 9: Method 9: Calibration 1: Results

Instrument 10: Method 10: Calibration 1: Results

Instrument 11: Method 11: Calibration 1: Results

Instrument 12: Method 12: Calibration 1: Results

Instrument 13: Method 13: Calibration 1: Results

Instrument 14: Method 14: Calibration 1: Results

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20 Jan 2004 15:02:03

ANALYTICAL EXPERTISE

In 1991 P S Analytical's in-house research programme funded the development of the Excalibur Atomic Fluorescence Spectrometer. Using a multi-reflectance filter to isolate fluorescence wavelengths of interest and specific boosted hollow cathode lamps to induce fluorescence, the Excalibur AFS provided low level determination of Arsenic, Selenium, Antimony, Tellurium and Bismuth in environmental samples. The instrument was redesigned and relaunched in 1997 as the Millennium Excalibur, offering greater sensitivity, reliability and a smaller footprint.

Since 1983 P S Analytical's experts have worked at the cutting edge of environmental monitoring, with a focus on automated low-level analysis.

PSA continues to invest in its research programme to provide total solutions to the marketplace. Systems provide the ability to carry out mercury speciation as well as offering total mercury determination. The Millennium Merlin system utilises the most sensitive technique for analysing mercury and offers unrivalled sensitivity and performance.



FEATURES AND BENEFITS

- Linearity - Over 5 orders of magnitude
- Sensitivity
- Detection levels for
As – 10ppt
Se – 2ppt
Sb – 10ppt
- Ease of Use - A simple change of lamp to switch between element analyses
- 0-1 volt output allows simple coupling to chromatograph data packages for specialist measurements
- Affordability – ability to extend analytical capability to mercury

THE ENVIRONMENT

The hydride forming elements, and arsenic, selenium and antimony especially are of particular concern to the environmentalist and legislators. Increasingly, regulators are reducing the acceptable levels of these elements, placing significant demands on the analyst to ensure that the detection limits set are achievable. The Millennium Excalibur provides a simple reliable means to achieve this.

ANALYTICAL OPTIONS

The Millennium Excalibur, when coupled to vapour generation techniques has been shown to be a simple and reliable means of achieving the sensitivity and reproducibility required to meet the legislators' requirements, often out-performing more expensive and complicated techniques such as Inductively Coupled Plasma (Optical Emission and Mass Spectrometry).

ATOMIC FLUORESCENCE

Atomic Fluorescence by its nature is linear over six orders of magnitude. The Millennium Excalibur has the ability to detect widely differing sample concentrations, from a few parts per trillion to more than 10 parts per million without instrument adjustment or any interfering carryover from one sample to another. The system also offers an attractive means of coupling to separation techniques to determine the speciation profile of the hydride forming elements.

VAPOUR GENERATION

VG AFS provides the analyst with accurate, precise reliable data on a wide range of sample matrices with minimal interference. The Millennium Excalibur provides linearity, selectivity and unrivalled sensitivity at an affordable price to meet the changing needs of the regulatory requirements for the hydride forming elements.

PSA

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The Millennium Excalibur System

Designed for routine use, the Millennium Excalibur also offers a range of facilities necessary for today's researcher and analytical methods development chemist. Exceeding current legislation the Millennium Excalibur also has the ability to meet future requirements, particularly in the field of speciation profiling.

The simplicity and flexibility of the Millennium Windows software enables users to set the necessary analytical requirements at the actual time of analysis. Speed of analysis or reliability of measurement can be the prime goal and anytime with analysis rates in excess of 80 samples per hour achievable using discrete sample injection of sensitiveness in the region of a few parts per trillion often needed for speciation profiling. A unique feature of the Millennium software is the ability to use one computer to control multiple instruments analysing different elements. The Millennium's combined vapour generator and AFS detector avoids the difficulties often encountered in routine laboratory tests when a single vapour generator is used both for the measurement of multiple elements.

SPECIATION PROFILING

Research groups worldwide with an interest in the speciation of mercury, arsenic, selenium and antimony are working closely with P S Analytical utilising the Millennium systems. Ion chromatographs and high performance liquid chromatographs are being successfully coupled to the P S Analytical AFS detectors. Whether a



user's interest is routine or research orientated, PSA can assist in the initial stages of this interesting field of study with chemical and technical advice and support. Complete packages or simple retrofit units to customers existing chromatography units are available. Why tie up significant levels of instrumentation when you can achieve more with the AFS approach?

SUPPORT

P S Analytical's company ethos is not to see a customer/supplier relationship rather to view this as a partnership arrangement. Our experts have over 20 years background experience in the measurement of the hydride forming elements and provide methodology and applications support complementing the sensitivity and



Front loading cassettes with customised tubing extends tube life

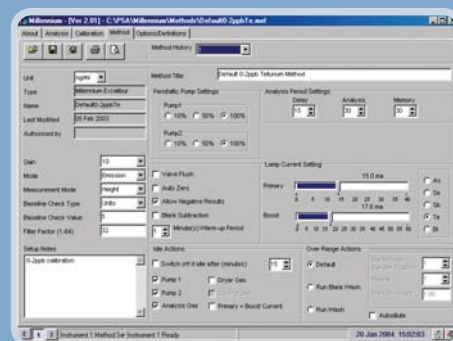


Perma Pure cassette continuously removes moisture

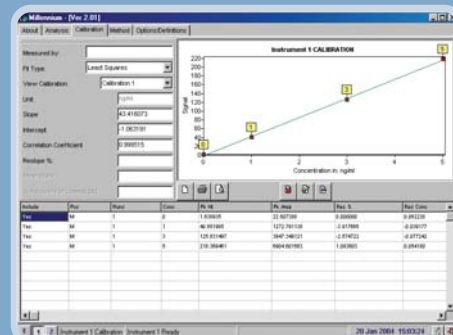


MILLENNIUM SOFTWARE

The PSA Millennium Software provides instrument control and data acquisition running under MS Windows™



Complete control of all instrument parameters from method



Extended calibration range with up to 12 standards. Full amending of fit type and points allowed



Easy to edit autosampler sequence with standards, checks and samples



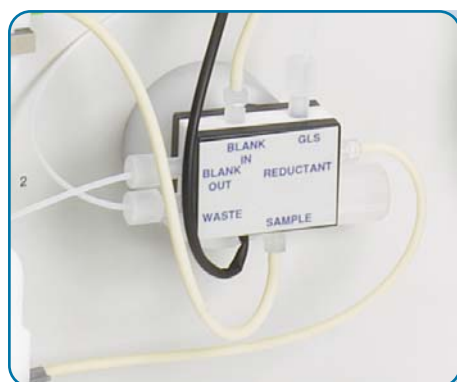
Ability to look at peak shapes during and after run. Peak shown 1ppb As

- Fully Multi-Tasking
- Add a calibration, multiple samples and checks at the touch of a button
- Set the system to automatically shut down at the end of a run
- User definable results display
- Set overrange criteria, such as automatically running a blank after a high sample
- Export to LIMS software
- Complete saving of all information about a particular sample
- Keep a history of all modifications made to a particular method

reliability of our instrumentation. Visit our website and you will see that we have a breadth of experience second to none across many industries. Our applications group and our customer relationship management ensure that sample analysis begins as soon as the equipment is installed and our team of experts assist with sample preparation and analysis and ensure that the instrumentation performs to customer expectations.

TECHNICAL SPECIFICATION

Weight:	Approximately 20 kilos	Height:	445mm
Width:	320mm	Depth:	185mm
Voltage:	240 V AC at 50 Hz	Power:	192 VA
	120 V AC at 60 Hz	Class:	II



New valve concept to conserve reagents



And, If your problem is listed below,
we already have the solution...!

MATRICES

Water
Drinking
River
Estuarine
Sea
Rain
Waste

Sediments
Sludge
Soil

Blood
Breath
Dental amalgam
Fish
Urine

Acids
Air
Alkalis
Coal
Condensates
Crude oil
Fly ash
Hydrogen
Metals
Naphtha
Natural gas
Oxidants
Reductants
Salts
Stack gas
Syn gas
Trade effluents

INDUSTRIES

Agriculture
Analytical science
Atomic energy
Chloralkali
Contract laboratories
Dental analysis
Environmental
Food
Gas
Marine
Metals
Natural gas
Oceanography
Oil
Petrochemical
Photography
Process engineering
Research institutes
Universities
Utilities
Water services
Water treatment

...if not, PSA can be relied upon to find it!

Research on other applications continues. If you have a problem
in an area that is not shown above – then call us for advice.



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