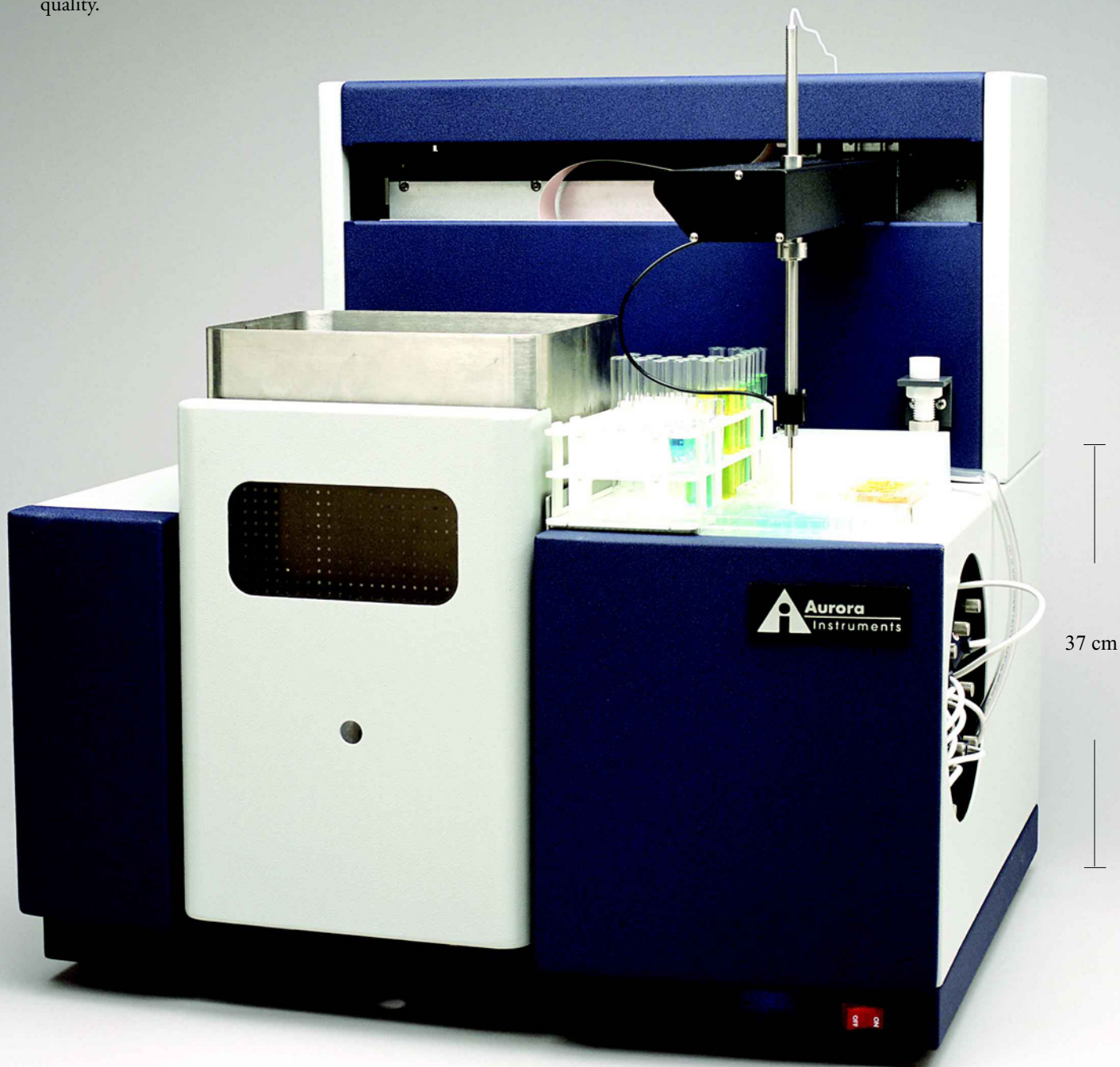


Aurora Instruments Ltd., based in Vancouver Canada, is dedicated to designing, manufacturing, and servicing atomic absorption spectrometers and other analytical instruments. Our mission is to provide analytical chemists with unique, high quality instruments and long-term technical support

For more than a decade, Aurora has provided chemists with innovative technologies to solve unique analytical problems.

Aurora Instruments Ltd. has achieved ISO 9001 certification for the marketing, development, and manufacture of analytical instruments. This certification gives customers the confidence that our products are of consistent quality.



Dimensions of W 65 x D 55 x H 37 cm

**ISO 9001**  
**REGISTERED**

# “The smallest, **Most Versatile** atomic absorption Spectrometer”

## Available Configurations for the AI 1200 AAS

- AI 1200 Flame
- AI 1200 Graphite Furnace (GF)
- AI 1200 Flame/Graphite Furnace (F/GF)
- AI 1200 Vapor Generation (VG)

### Switchable Single/Double Beam Optics

Switch between Single Beam and true Double Beam optics with just the touch of a button

### Quick Switch Between Flame, VG and GF Atomizers

The manual or motorized platform positions the Flame, VG and GF atomizers, enabling the quick transition between different atomizers

### Transversely Heated GF Tube

Unique design allows for an extremely uniform temperature distribution, creating spatially isothermal atomization conditions

### High GF Heating Rate

Industry leading GF tube heating rate (3800 K/s) ensures that isothermal atomization conditions are achieved

### Teflon Nebulizer Chamber

Chemically inert to provide superior resistance against the most corrosive of reagents, including organic solvents

### Titanium Burner Head

Titanium construction ensures a long life for the burner head

### Universal XYZ Autosampler

Compatible with all types of atomizers: Flame, GF, or VG

### Auto Aligned & Coded Five-Lamp Turret

Motorized and computer controlled to hold five pre-heated hollow cathode lamps in auto-alignment

### Small Footprint

Instrument dimensions of W 65 x D 55 x H 37 cm or W 25.6 x D 21.6 x H 14.6 inches

### Built-In Power Supplies

Independent power supplies for both the high intensity hollow cathode lamps and the GF are housed within the above quoted dimensions.

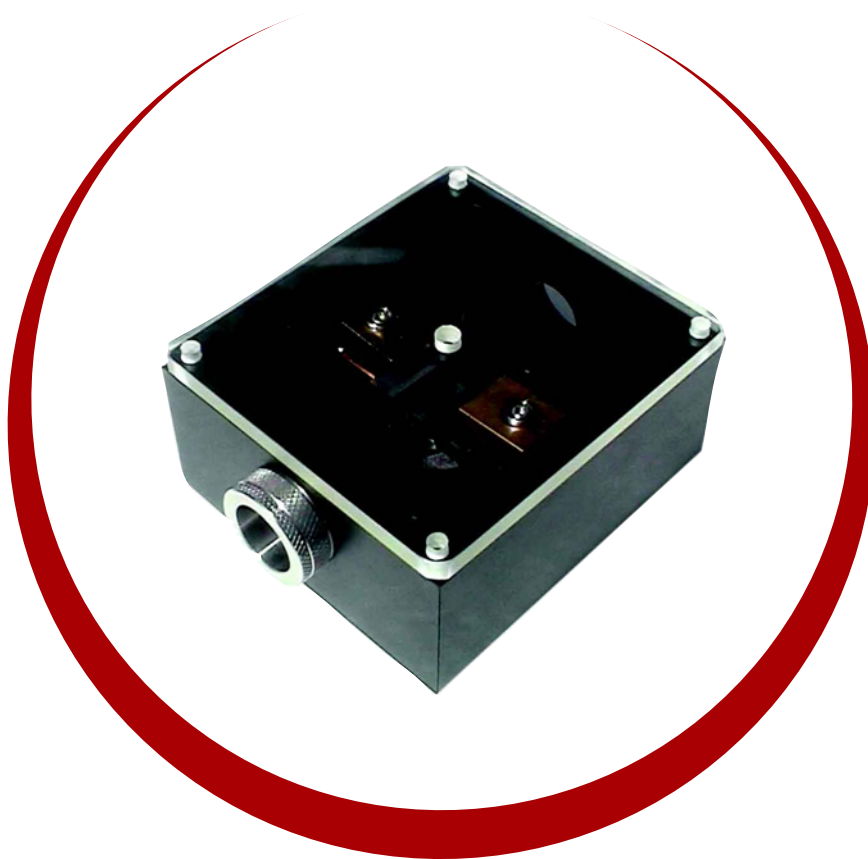
### On-Line Dilution

Use a single stock solution to create an entire set of calibration standards

AI 1200 AA Spectrometer

# “Why use Transverse Heating Graphite tubes?”

Aurora Instruments utilizes a transversely heated graphite tube that creates an extremely uniform temperature distribution over the entire length of the tube. With this technology, the AI 1200 eliminates many of the problems that are normally associated with GF methods. Driven by the digitally controlled GF power supply, heating rates for the graphite tube can reach 3800 K/s.



The transverse heating and high heating rate provides spatial and temporal temperature profiles that are nearly isothermal with the following benefits:

1. Virtual elimination of ‘memory effects’, even for refractory elements
2. Lower atomization temperatures and shorter atomization times, thereby extending graphite tube lifetime
3. High sensitivity due to narrow peak and high atomization efficiency
4. Reduced chemical and background interferences
5. Simplified method development



# Graphite Furnance

## Unique Capabilities

Aurora Instruments Ltd. is constantly developing unique AAS applications. For example, Aurora developed the first multi-role spectrometer that combined the merits of graphite furnace atomic absorption spectrometry (GFAAS) with an inductively coupled plasma atomic emission spectrometry (ICP-AES). Aurora also developed the patented Capacitively Coupled Plasma Graphite Furnace (CCP-GF) technology.

## High Atomization and Excitation Efficiencies

Plasma atomic emission spectrometry (P-AES) is known for its high excitation efficiency and is an excellent source for simultaneous multi-element analysis of metals and non-metals.

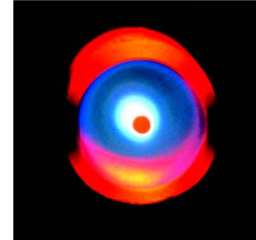
With P-AES, the graphite furnace is used to dry, char, and atomize the sample while an Ar or He atmospheric pressure RF plasma is generated inside the furnace. The plasma excites the atomized sample, causing intense emissions from the excited atoms and ions.

The exceptional performance of the emission spectrometer is due to the combination of the high atomization efficiency of the isothermal atomizer with the high excitation efficiency of the plasma.

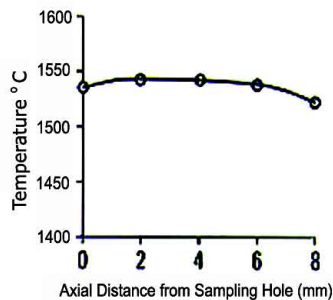
The most important factor in the reproducibility of GF atomization is the drying stage. If the temperature control of the furnace is inaccurate then reproducible drying conditions may be impossible to achieve. Aurora has focused its efforts on perfecting the AI 1200 drying stage to ensure the most reproducible results for the user.

## Advanced Temperature Control

In addition to our high temperature sensors already found in previous models, the AI 1200 uses specially designed temperature sensors for control of the low-range temperatures (accurate to within 1 degree). This combination of sensors provides accurate temperature control over an extremely wide range. The result is objective temperature data, whereas other competitors rely on simulated logarithms.



Plasma inside a graphite furnace



The graph shown here demonstrates the spatially **isothermal temperature** profile of the AI 1200/2200's transversely heated graphite furnace.

# “Versatile Performs”

System that



With its guaranteed performance, our Flame Atomic Absorption Spectrometer (FAAS) is one of the premier AAS's in its class.

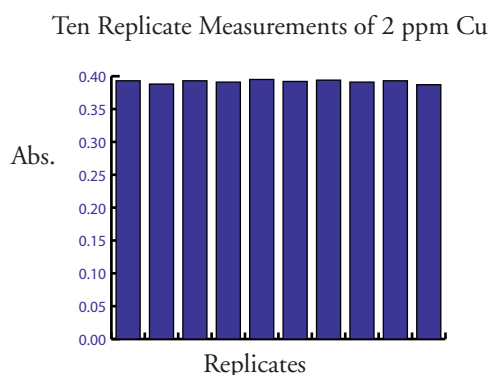
Advanced features of the system are:

1. Fully inert Teflon spray chamber
2. Titanium burner head
3. Nebulizer impact bead
4. High sensitivity nebulizer

The above are components of a flexible system that can accommodate a variety of techniques... from the most delicate and sensitive to the most demanding.

## Performance and Precision

We believe this is what sets us apart from our competitors. Typical performance for a 2 mg/L Cu sample on our AI 1200 is 0.4 Abs. The system offers high precision as well as better than 0.5% RSD from ten 4-second integrations under optimized conditions.



## Standard Safety Interlocks

### Burner Heads

If there is no burner head installed or if the burner head is not connected properly, ignition of the flame will not be allowed

### Flame Sensor

The gas valves are automatically shut off whenever the flame is unexpectedly extinguished

### Gas Pressure

Gas pressures are monitored and adjusted to ensure a stable and consistent flame. There is a pressure sensor to ensure that the flame is shut off if the gas pressure drops too low

### Power Failure

The flame is automatically shut off in the event of a power failure

### Liquid Gas Seal

The level of liquid in the liquid trap is constantly monitored. If the level gets too low the flame is shut off and flame ignition will not be allowed.

Safety is a high priority at Aurora and we want to provide a safe and reliable working environment with every AI 1200 instrument. The many computer controlled safety features incorporated in the instrument include automatic oxidant selection, oxidant changeover, computer controlled gas flow rates, automatic ignition, and online flame status. When one considers these features combined with the standard safety interlocks and the comprehensive flame control, it becomes clear that safety is a high priority with Aurora Instruments.

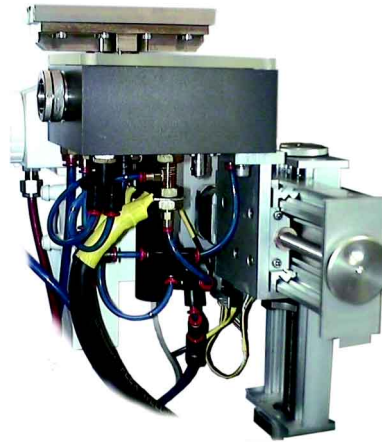
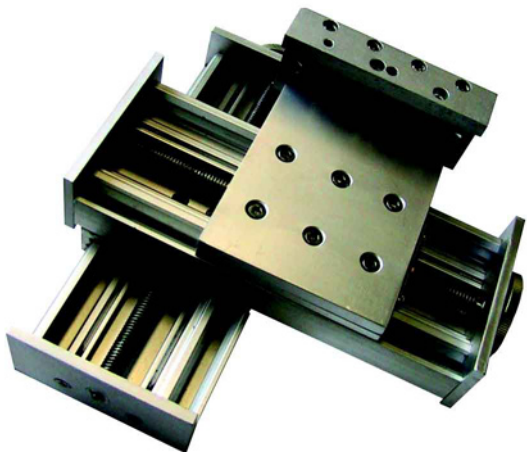
# Flame

# “Quick-switch Changeover Design”

The configuration of the Flame and GF atomizers allows for the quick changeover between atomizers. This new Quick Switch feature makes the changeover quick and easy, literally within seconds. With the option of a motorized platform, this task becomes even more effortless with just the click of a button to automatically align the platform in the optimum position. We have applied this level of automation and flexibility with the user in mind. The sophisticated nature of the AI 1200 AAS has been engineered for precision and simplicity of use. The AI 1200 incorporates automated features that will make any laboratory more efficient:

- Motorized 5-lamp turret
- HCL auto-alignment
- Programmable wavelength
- Programmable slit width/height
- Programmable gas selection and gas flow

All these user-friendly advantages found within our compact design certainly makes the AI 1200 Flame/GF worthy of a second look.



## Best of Both Worlds:

The AI 1200 Flame/GF is literally two instruments in one. The Flame component has these key features:

- Inert Teflon nebulizer chamber
- Online dilution
- Safety interlocks

The responsive nature of the GF configuration extends the capabilities of the AI 1200. The GF component has these key features:

- Transversely heated GF tube
- High heating rate
- Built-in power supply

When combined with the one-for-all Universal XYZ Autosampler, the AI 1200 becomes an automatic system that is easily controlled through the software interface. Simply set up the autosampler and let it run while you complete your other tasks. The Autosampler is a very powerful analysis automation tool and a definite asset in any laboratory.

Flame/GF

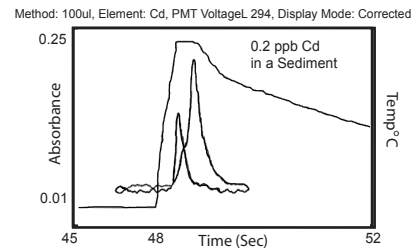
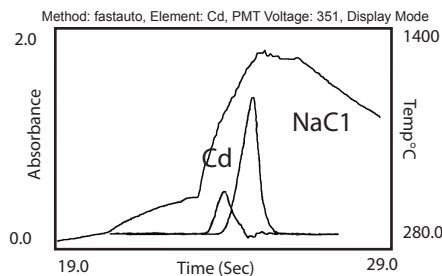
# “For Maximum cost effectiveness”

For optimum analysis efficiency, it is important to utilize the most appropriate method of background correction. Many spectrometers on the market employ several background correction methods but these often fail to provide chemists with the best solution. To determine the method that is right for you, you must first decide which of the following criteria are required by your application:

- Spatial overlapping of HCL and Deuterium lamp beams minimize background residue
- High modulation frequency enables high-speed measurement of signals
- High-speed data acquisition maximizes the number of data points per peak
- High-energy source and high efficiency optics ensures a high signal-to-noise ratio

## Aurora's Background Correction Techniques

The AI 1200 AAS offers two different background correction techniques to provide chemists with the ability to resolve background interferences that are associated with the majority of AAS applications. The AI 1200 employs the Smith-Hieftje and Deuterium lamp background correction methods.



## Smith-Hieftje Correction Technique

This technique is a standard feature on the AI 1200 and provides chemists with a simple, low cost, and effective background correction technique. This method uses the same light source as the analyte signal measurement, so no additional hardware or optics are required.

## Deuterium Correction Technique

Aurora has selected this method for everyday normal use. It provides cost effectiveness but maintains robust performance. For the majority of applications, this is the most effective and reliable method of background correction.

## Time Resolved Background Correction

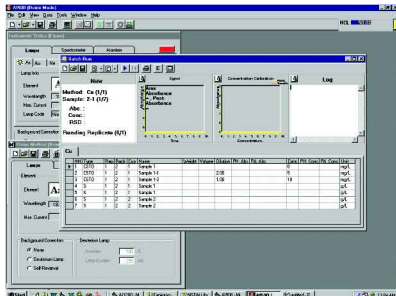
Analyte signals can be separated from the background absorbance with the use of superior heating control and high-speed data acquisition. Extremely high background noise can be corrected for with the use of our Time Resolved Background Correction Technique.

## Superior Features

The following features have made superior detection and excellent sensitivities the norm for Aurora's AAS:

- High modulation frequency
- High speed data acquisition
- High intensity deuterium lamp
- High energy optics

# “Wizard Interface”



## Easy to Use

The AI 1200 standard Windows interface means a lower learning curve and reduced training costs. Our software has been built around the philosophy that users should be able to easily and quickly develop methods that meet their unique requirements. Experienced and novice users alike will find our software simple and easy to use. The analysis template concept provides a non-rigid method development environment.

The software screen is well organized with tags and buttons that are easily accessible. Our templates use an easy 3-step process: open the method, load the sample, and push the button. It's just that simple.

## Benefits

Quick adjustments can be made to the instrument during a method development. Hence, whether your laboratory is a complex research facility or a quality control laboratory, the “Set” and “Go” features will allow you to maximize instrument potential. You can also customize the window view to display only what is necessary for your analysis.

## No Simulations

Aurora's software has no simulations. Instead, it uses real-time displays of temperature, total absorbance, corrected absorbance, and background absorbance in relative units of peak height and peak area. Any one of these can be isolated for easy interpretation of

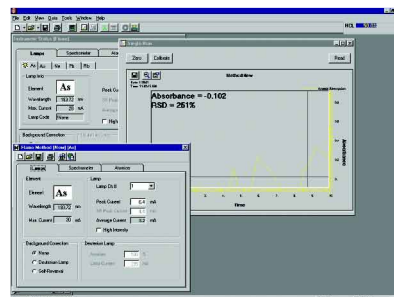
data. Real-time graphics and data means reliable and consistent analyses. The AI 1200 uses both high- and low-range temperature sensors on the GF model to provide actual temperature data over a wide working range. The temperature values displayed are measured values, not calculated approximations.

## Accurate and Powerful

The wavelength scan feature enables the chemist to scan a narrow spectrum around the wavelength of the HCL being used. This allows for fast and easy optimization and calibration of the instrument for each HCL.

## Fast Access to Methods

The AISPEC™ software of the AI 1200 features unique LIMS support, which facilitates the exchange of sample information into a variety of data formats. Users can add their own customized information that can be exported for reference. This turns LIMS integration into a simple and flexible process. A key feature of this support is that everything has a bar code, ensuring that all the data is in place. Some competitors claim to support your LIMS system, but only allows importations of selective data. Aurora realizes that you may need additional supplemental information in order to re-integrate your results into your LIMS.





## Universal XYZ Autosampler

Aurora's Autosampler is an advanced one-for-all XYZ Autosampler for GF, Flame, and Vapor Generation (VG) analyses. The freedom of movement in all directions permits versatility that is unattainable with conventional rotary type autosamplers. The XYZ Autosampler has the flexibility to adapt to almost any sample container:

- Microplates
- Standard test tubes
- GF sample cups
- Custom GF sample cup sizes

The limits of what the XYZ Autosampler can do have been expanded with the use of our AISPEC software, which allows:

### 1. Calibration from a Single Standard

- The digital micro-volume pump automatically dilutes a master standard for calibration and standard addition
- It also allows for an easy dilution process that brings any out-of-range samples into the calibration range

### 2. Perform Online Sample Preparations

- The table driven command allows the use of any volume combinations of sample, standard, modifier, and blank solutions; thereby, accommodating requirements for method development and quality control.

### 3. Perform Fast-Dry Furnace Techniques

- This technique involves user-programming of injection speed, preheating of temperatures, and cooling time.
- By using preheating and cooling levels of less than 150 °C, fast analysis times of less than 20 seconds can be achieved, equating to throughput efficiencies of over 3 samples/minute



“Flexibility”

Autosampler

# “Quality”

## Vapor/Hydride Generator

Aurora's VG 411 provides enhanced sensitivities, reduced interferences, and extremely low detection limits for the determination of sub-trace levels of mercury and hydride-forming metals. Aurora's revolutionary design of the gas-liquid separator allows for optimum performance for both hydride and Hg cold vapor determinations. The three mixing sections of the reaction/mixing manifold provide the operator with many setup options. The instrument has been designed to work not only with the AI 1200 AAS and AI 3200 Atomic Fluorescence Spectrometer (AFS), but also with AAS, AFS, ICP-AES, and ICP-MS instruments offered by other manufacturers.

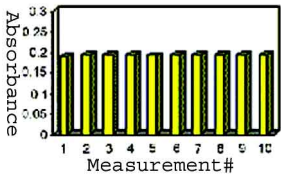
## Revolutionary Gas-Liquid Separator

The dead-volume design of the gas-liquid separator allows the chemist to quickly optimize the instrument according to their application. For metal hydride determinations, the volume can be increased to minimize pressure fluctuations, thus enhancing the precision of the measurement.

For Hg determinations, concentrated sulfuric acid can be safely used as the drying agent in the gas-liquid separator

## Reaction/Mixing Manifold

The reaction/mixing manifold of the VG 411 includes three mixing levels, each with three mixing ports (female threaded). The operator has near limitless flexibility in terms of mixing patterns, enabling convenient online addition of any reagents required for acidity adjustment, pre-reduction/oxidation, or masking of interferences.



Two, high quality motor construction peristaltic pumps provide dependable and consistent pump speeds, ensuring reproducible measurements, sample after sample.



# Vapor Generation