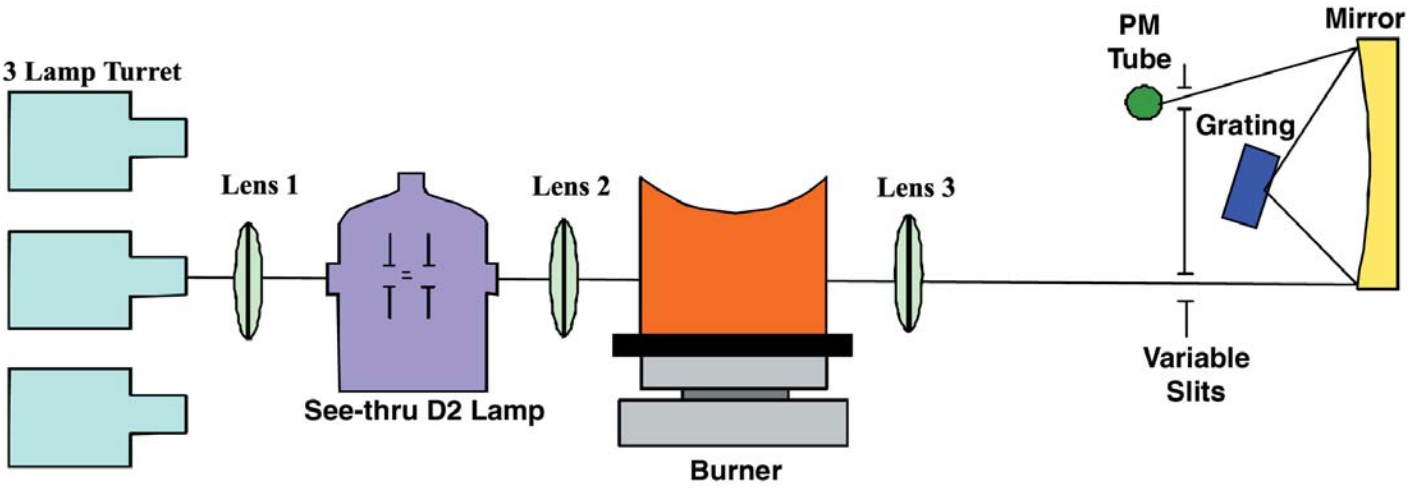
Atomic Absorption Instrument & Accessories Catalog

The Single Beam Optical System

From the time of the initial developments of Atomic Absorption Spectrometry (AAS) 50+ years ago, the concept of the single beam optical system was always a fundamental design consideration. It allowed high energy throughput for the best detection limits, smaller and fewer components for the best size, and low manufacturing costs for the best price. Unfortunately, those original single beam AAS instruments made over 50 ago years were not used routinely due



to the inherent deficiencies in the components of the time: poor hollow cathode lamp characteristics, noisy Power Supplies, drifting detectors & amplifiers, thermal expansion variations in optical components (mirrors, beamsplitters, mounts, etc.), and so forth. To compensate for these deficiencies, and to help them stay in business; the AAS manufacturers developed the double beam optical system that became the standard design for AAS instruments over the next 30 years. By using a high light-loss optical component, the beam splitter, to divide the signal beam from the hollow cathode lamp, served to correct for these low performance components; thus halving the available energy to make a sample measurement, compensation between the reference and sample beams was maintained. In later years, the addition of a deuterium continuum lamp for background correction introduced a second beam splitter; thus cutting the hollow cathode lamp energy in half again. This does not even take in to account the 6-10 additional Mirrors used to define the optical path for these large, heavy and expensive (albeit very stable) double beam AAS instruments.

ENERGETIC EVOLUTION:

The Buck Scientific line of Atomic Absorption Spectrophotometers were designed to utilize the maximum energy of the single beam optical system. This allowed us to build a smaller, less expensive and more sensitive instrument. Background correction was achieved by inserting the deuterium lamp directly after the hollow cathode lamp and using variable giant pulse.

Simple to Operate

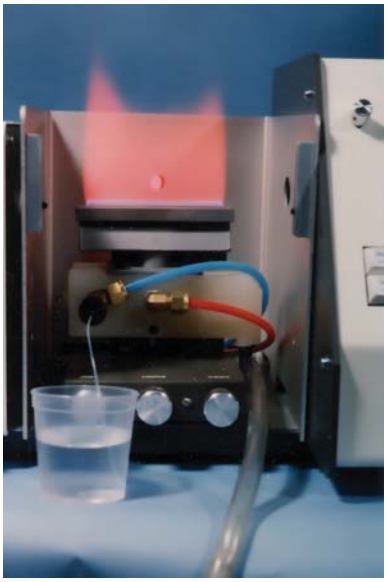
Inherently reliable

Cost Effective

Proven analytical performance

Buck Accusys 211

Buck Scientific's 200 series Atomic Absorption Spectrophotometers are the culmination of more than 25 years of success and experience as a manufacturer of spectroscopy instruments. The 200 Series AA's are powerful, compact and cost effective solutions to all atomic analyses. It has been designed to meet the performance and flexibility your laboratory requires—now and in the future.



Standard Features

The 200 series AA's are shipped ready for use. All operating conditions are pre-loaded in the internal computer, including lamp settings, secondary wavelengths, and alternate methods of analysis for over 60 elements by flame, furnace, or hydride techniques.

The three lamp turret has individual controls for alignment and standby mode to keep lamps warm.

Direct report generation to a printer or data linking to the optional Buck Analyst software package is easily done using the parallel and RS232C ports.

Fully integrated safety interlocks for gas pressure sensor, drain line trap and ignitor insures safe operation of the 211AAS

Analytical Performance

The Buck 200 series AA's are high energy, microprocessor controlled single beam atomic absorption spectrophotometer. Solid state electronics and simple optics provide the basis for our superior stability and sensitivity. The Ebert mount monochromator and user-selectable bandwidth give the system maximum flexibility. Our short-path dynamic nebulizer/burner configuration is highly efficient. An inert needle, precisely positioned in a high flow venturi, delivers sample to the corrosion proof impact bead. This results in a tremendously high nebulization effect for all types of sample matrices.

Cost Effectiveness

The 210/211 is designed for minimal maintenance. The burner assembly is easily accessible for quick cleaning. The microprocessor uses state-of-the-art components and is machine assembled for quality and reliability. With the best performance-to- price ratio in the market, the 210/211 is truly an affordable instrument that will maximize your return on investment.

Unique Furnace Design
The Model 220 GF accessory is the latest technology in PPB level analyses by graphite furnace AA. This fully integrated design uses an innovative, unique technology in a compact powerful furnace module. The quick-mount design permits rapid change over between furnace and flame heads.

Capabilities
The unique power supply in our furnace is capable of generating temperatures up to 3000°C in less than a second! This ultra-fast heating rate provides superior sensitivity in refractory elements and carbide-forming metals. The on-board firmware gives the analytical chemist full control of all aspects of the analysis. Gas flows (external, internal, mini-internal and auxiliary are standard), data collection (integrated, real-time, or absorbance area) and electronic parameters for the hollow cathode lamps and the various background correction routines can all be programmed by the operator for maximum results.

Methods
The Stabilized-Temperature Graphite Furnace AA (STGFAAS) procedure insures the highest accuracy & reproducibility.

The 210/211 can initiate multistep sequences with alternate gas purging for fully optimized STGFAAS.

System Integration
The integration of the controlling software with the furnace module is comprehensive, and methods development time can easily be cut in half by using our protocols to refine an analytical method.
The Model 220AS random-access autosampler will fully automate your analytical operations without the need for an external PC to control the system. By incorporating a sample ID table within the software, complete data handling can be done internally.

High Throughput Programmable Autosampler

Modular Compact Design

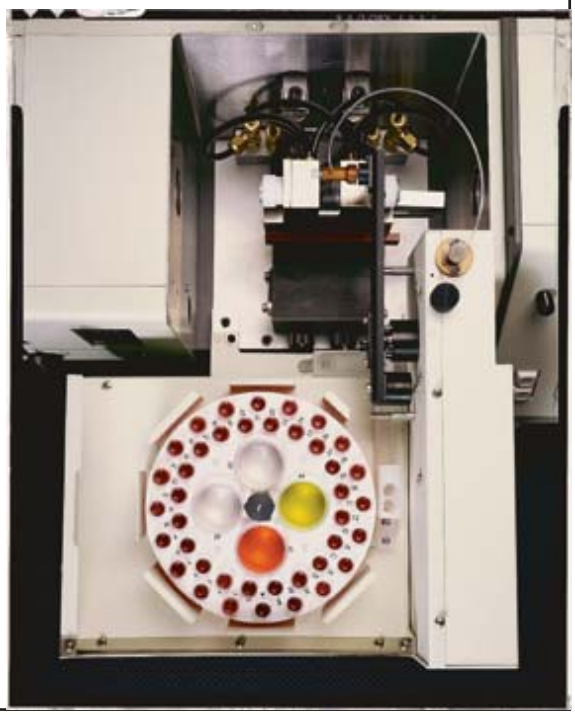
Interference free Analysis

Simplified Method Development

Elemental Libraries

Buck Model 220 Graphite Furnace Autosampler

Complete system automation can be achieved using the Model 220AS autosampler. This fully programmable, random access system provides 40 sample cups and 8 calibration/QC cups. It can also perform automatic matrix modifier additions. Sample cups can be identified in the built-in table, and method development time can be reduced substantially.



Onboard Software

Complete user accessibility and control

Flexible format gives detailed information

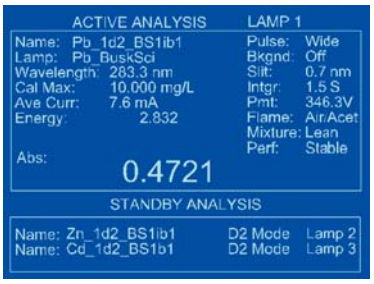
Full hardware integration

Internalized routines for maximum efficiency

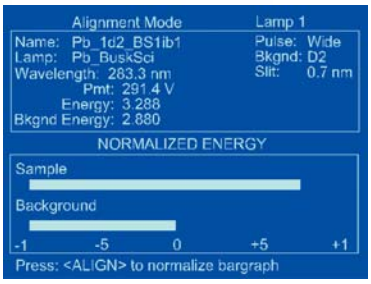
No external PC required for operation

On-board Microprocessing

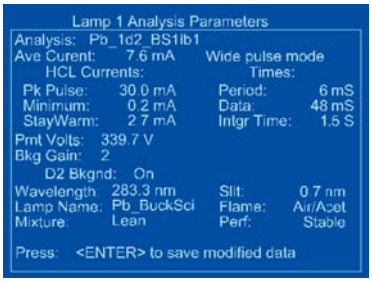
The completely integrated firmware found in the Buck 210/211 gives absolute control of operation and data manipulation. From setting lamp parameters to optimizing calibration curves and furnace temperature/ time programs; the internal firmware provides access to all of the system settings.



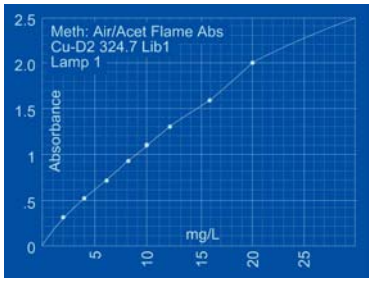
Main Screen Analytical Data
Element file, wavelength, slit aperture, calibration data, energy mode, H-C Lamp current, and PMT voltage are all actively displayed with the raw absorbance and analytical methods.



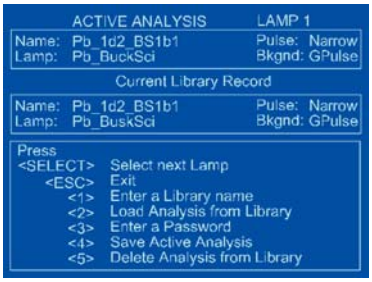
Text & Graphical Energy Profile
The user can fully optimize the optical energy throughput of the H-C lamp and D2 background corrector using the real-time bar graph and numerical energy readings.



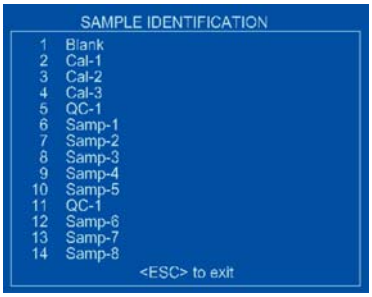
Fully Variable Parameters
A full range of analytical conditions is set with default values for typical analyses. Full access is provided to the user to allow detailed optimization for custom analyses and for specific operations.



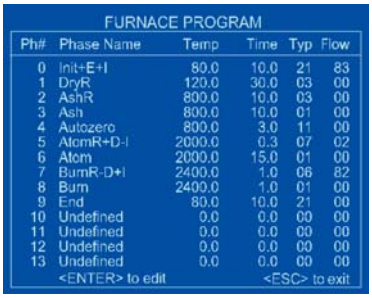
Accurate Calibration Data
The calibration screen displays up to 8 points on any of 4 defined curves; linear (1st order), quadratic (2nd), cubic (3rd), and polynomial (4th) for extended linearity and improved precision to get maximum data throughput.



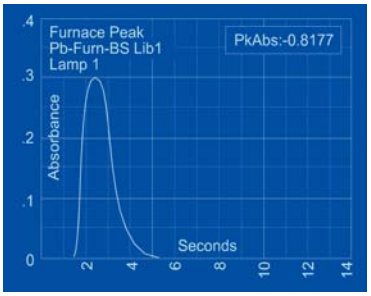
Comprehensive Internal Library
An upgradable, high capacity library contains over 100 pre-programmed analytical methods. The user can define up to 100 additional modified or new files for their specific applications.



Sample Identification
The flexible nature of the 210/ 211 firmware simplifies the creation of an autosampler ID table for your samples and standards. Automatic recalibration and QC checks can be inserted anywhere in the sample sequences for the ultimate in precision and accuracy.

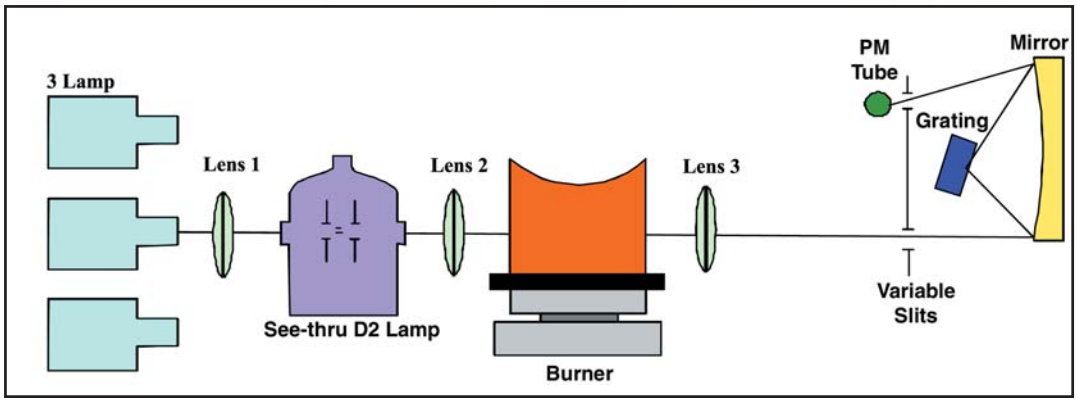


Full Hardware Integration
All available accessories for the 210/211 can be directly controlled from the internal software. The furnace program, autosampler table, and output controls are all easily accessed and can be modified for custom configuration.



Real-time Data Acquisition
The unique, high-gain signal response of the 210/211 is immediately presented in a graphic display. The accurate time scale allows the user to adjust analytical conditions to optimize results.

Optical System
Buck Scientific's "Stable Beam" System creates an optimum optical alignment. We have the lowest number of energy reducing optics (no energy wasting beam splitters) for the greatest throughput of sample energy.



Background Correction
The Model 210/211 offers *two* exceptional background correction systems; a unique, in-line D2 system and Variable Giant Pulse (VGP) correction.

Deuterium (D_2) Continuum Lamp Correction
A D_2 lamp emits radiation from the far-UV region (<190nm through approximately 350nm). With our proprietary in-line system, the D_2 emission corresponds precisely with the spectrum of the analyte. Using modulated signals, the absorbance of analyte and background interferences are ratioed resulting in a clean, unbiased absorbance signal.

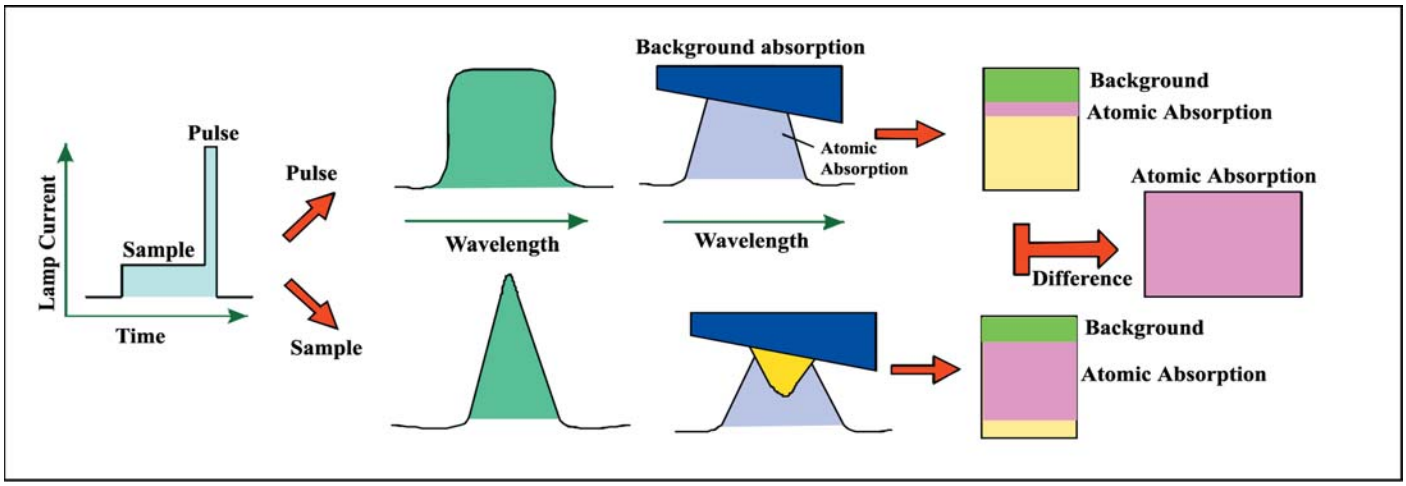
Variable Giant Pulse (VGP) Correction
Hollow cathode lamps normally operate at currents of 3-15 mA. If the applied power is raised to several hundred mA, they exhibit a phenomenon called self-reversal. This giant pulse of current changes the nature of the analyte absorption line so it will only measure the background absorbance like D_2 correction, the background absorbance is subtracted from the total signal to give the corrected sample reading. The VGP system removes interferences for elements outside the normal D_2 - UV region.

Buck's unique internal software allows the user to vary both modes of the background correction to optimize the analysis for selected elements

Proprietary straight-line optics with single mirror

Unique "In-Line" D 2 system doubles energy throughput

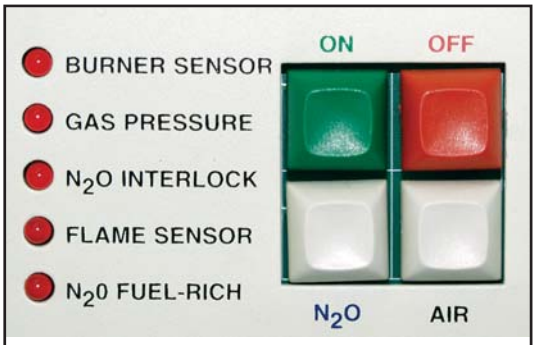
Variable Giant Pulse correction for non-UV work



Variable Giant Pulse Correction Mode

Accusys 211

The Accusys 211 AAS is the next evolution of the highly successful Buck 210VGP , incorporating a series of sophisticated automatic functions and safety features into the high-sensitivity, interference-free design of Buck's unique "Stable-Beam" optical system. The proprietary non-Flame ignition system and automatic controls make the Accusys-series instruments the AAS of the new Millennium.



Accusys 211 Gas Box

Features:

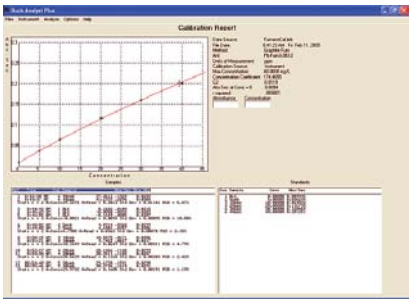
- Built-in microprocessor with Software for operation
- Methods Library for Flame, Furnace, and Hydride
- Autosampler, hydride generator & cold vapor upgrades
- 3 Lamp Turret with power to each lamp
- In-Line Deuterium Background Corrector
- Variable Giant Pulse Background Corrector (self reversal)
- Safety Interlock for N2O Gas & Burner Head
- Variable Slit Band Width 2A, 7A & 20A
- Outputs: RS-232, Parallel Port, Recorder
- Ability to add Graphite Furnace and Autosamplers
- Dimensions: 40"L x 12"W x 12"H; Weight: 50 lbs.

- Unique non-flame ignitor provides the safest instrument start-up
- Simple 3 button operation for fully automatic gas controls, ignition and gas switchover (Air to Nitrous Oxide)
- Analytical parameters are displayed when method files are loaded from the 211's built-in Methods Library
- Fully integrated safety interlocks for gas pressure sensors, burner head type, UV flame sensor, drain line trap and power failure insures safe operation of the 211 AAS
- Upgradable to the model 220GF back-mounted graphite furnace for ppb/ppt trace level analyses

210VGP

The Buck Model 210VGP was the first of the 200 series spectrophotometers. The 210VGP is still our most popular instrument because it strikes a perfect balance between value and performance.

Buck Analyst Software



Buck Analyst is a program that is designed to provide the 210 series operator with the basic tools needed to capture data from the instrument results, display that data and document the results in a convenient form. The major enhancements to the instrument built in data management routines are the ability to print calibration curves and the addition of a calculated R square value.

205AAS

The 205 AAS is the next evolution of the highly successful Buck 210VGP. The 205 is a rugged, economical and highly sensitive instrument which is perfect for industrial, educational and QC operation.

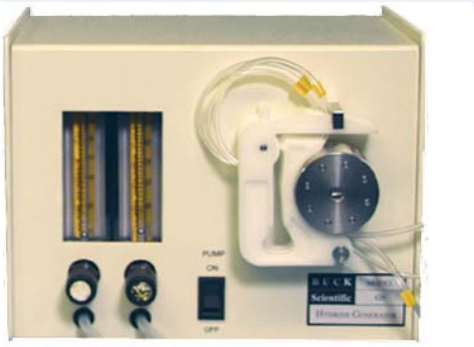
Perfect for simple analysis not requiring D2 Background correction.

- Internal microprocessor generates calibration curve with graphical and tabular formats
- Dual lamp power, one for warm up
- High throughput "stable beam" optical system
- Modulated HCL power supply to cancel DC emission from flame
- Digital readout for absorbance, emission, direct concentration, lamp currents and PMT voltage
- Autozero, integration and high gain damping features
- Bandpass resolution from 0.2 - 0.7 - 2.0 nm
- Burner safety interlock system for nitrous oxide/acetylene flame operation
- High sensitivity detection using quartz PMT detector
- Analog and digital output for chart recorders & PC data systems
- Compact Size and rugged design

The 205 Advantage

The Buck Scientific 205 AAS uses a unique burner system, to get more sample to the flame, which results in more signal and better sensitivity. We use an impact bead nebulizer to get an efficient generation of a fine aerosol of sample solution. The short path spray chamber permits difficult solutions containing organics or high dissolved solids to be aspirated with superb precision and minimal instabilities. To take advantage of this enhanced signal, we designed an optical layout that provides the highest throughput of any commercially available spectrophotometer. Our very simple straight line optical path uses a monochromator with a single reflector mirror. This cuts down on the amount of light loss often associated with models having multiple mirrors. Because of this, the Buck 205 AAS can detect far into the UV elements, such as arsenic and selenium, with ten times greater sensitivity.

420 Continuous Flow Hydride Generator



The Model 420 is an easily adaptable accessory for flame AA spectrophotometers that allows PPT detectability for As, Se, Sb, Sn, Te, Bi, and Ge using standard hydride generation procedures. Using inert Polymer components and a reliable pumping system, users can quickly switch between flame and hydride.

Features:

- Allows superior Detection limits for hydride metals compared to graphite furnace AAS, typically in the 100-500 PPT.
- Does not require hydrogen gas.
- Easy Installation and removal for changing back to flame operation.
- Four order of magnitude dynamic range using the Buck model 210/211 system for highest accuracy over a wide range of sample concentrations minimizing dilutions and errors.
- Inert Tubing gives rapid equilibration time allowing typical throughputs of 50 samples per hour with reproducibilities of better than 2% at the 500 PPT level

Example for detection limits for the Buck Model 420 Hydride System

Element	Wavelength (ABS)	Minimum. D.L.	Typical RSD at 10 PPB
Arsenic (As)	193.7 nm	0.15 PPB	1.5%
Bismuth (Bi)	223.1 nm	0.25 PPB	2.1%
Antimony (Sb)	206.8nm	0.20 PPB	1.8%
Selenium (Se)	196.0nm	0.35 PPB	2.6%
Tin (Sn)	286.3nm	1.0 PPB	8.5%
Tellurium (Te)	214.3nm	0.30 PPB	3.1%

Results Based on data from optimizedmodel 210VGP

1018 Combination Batch Cold Vapor & Hydride Generator

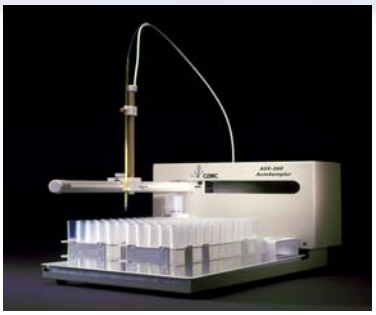
Overview:

Using the classic chemistry defined by the "Marsh Test" for Arsenic and other hydride forming metals, and the Hatch and Ott cold vapor reaction specifically for Mercury. The model 1018 batch mode attachment for flame atomic absorption system allows low PPB and high PPT sensitivities for these elements, respectively.

Features:

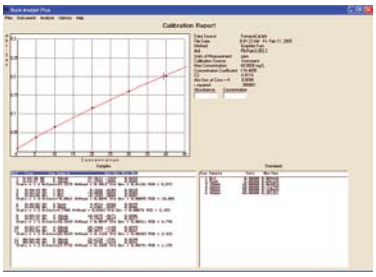
- Cold vapor method employs a simple acid matrix for the sample and uses Stannous Chloride for the reducing reaction to generate PPT level data for Mercury
- Simplified installation to existing flame AAS and predefined reaction chemistry allows an easy start up for rapid operation.
- Uses argon or Nitrogen for carrier gas, no need for Hydrogen for most applications.
- Hydride generation technique commonly used for As, Sb, Se and occasionally for Sn, Bi, Te and Ge; uses common acids and sodium borohydride reducing agent for low PPB detection limits in prepared samples.
- Meets the requirements for EPA standard methods 245.1, SW-846 and the 200 series potable water tests.
- Compact size allows unit to be placed conveniently next to AA systems.
- Readily available reaction flasks provide convenient sample prep and analysis in one vessel for high throughput work.
- Quartz absorption cells easily fit over burner head on Buck 210/211 AA systems using included bracket for both hydride and cold vapor operation.

Flame Autosampler



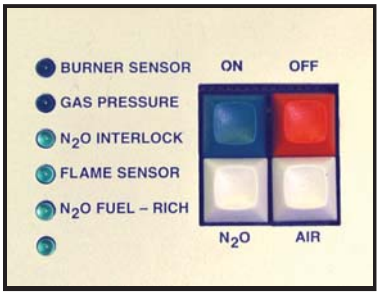
Model 240 Flame Autosampler
To enhance laboratory productivity, this 150 position autosampler features a fast access rate for unattended operation. Users can program various dilution and sample volumes with automated spike addition. A high quality coating resists acids and bases. Full random access allows for complete flexibility.

Data Aquisition Software



Buck Analyst Software
Buck Analyst is a program that is designed to provide the 210VGP and Accusys 211 operator with the basic tools needed to capture data from the instrument results, display that data and document the results in a convenient form. The major enhancements to the instrument built in data management routines are the ability to print calibration curves and the addition of a calculated R square value.

Auto Ignitor And Shutdown



Auto Ignitor and Shutdown
Unique non-flame ignitor provides the safest instrument start-up. Simple four button operation for fully automatic gas controls, ignition, and gas switch over (air to nitrous oxide) Fully integrated safety Interlocks for gas pressure sensors, burner head type, flame sensor, drain line trap and power failure insure safe operation of the 211 AAS.

Model 3370 Water recirculator for Graphite furnace

Model 3370 liquid-to-air recirculator
The Model 3370 economically removes heat in applications where the cooling fluid temperature is higher than ambient and control is not required. It offers significant cost savings over recirculators with mechanical refrigeration, plus the compact design saves space in your lab or factory. The main components are simple and effective. A positive displacement pump circulates fluid to your equipment, back into a reservoir, and through a fan cooled radiator which removes the heat. A built-in low liquid level indicator safeguards the reservoir and pumping system.

Atomic Absorption Accessories

Atomic Absorption Accessories
Buck Scientific offers high quality hollow cathode lamps, and aqueous and organic standard solutions. For furnace operation, we offer matrix modifiers and buffers, plus three styles of graphite tubes. Buck has all the accessories and supplies needed for AA spectroscopy. To order Accessories please call 800-562-5566 or visit www.bucksci.com and buy on-line.

Instrument Specifications

205/210/211 Atomic Absorption Spectrophotometer

Wavelength Range:	190 to 900nm, Accuracy ± 0.2nm, Precision ± 0.1nm
Monochromator / Optics:	250mm Ebert mount, 600 lines/mm grating, 0.2-0.7-2.0nm bandpass
Hollow Cathode Lamp Supply:	Triple HCL power supply; 3 to 75 mA peak in NORMAL mode, 3 to 750mA in GIANT PULSE mode. The 205 Has a two lamp design.
Background Correction:	Deuterium - In-Line (see-through) configuration, pulsed illumination, hot cathode, variable frequency, corrects from 190-350nm (0.7nm slit). Variable Giant Pulse - Self-reversing HCL currents up to 750 mA with pulse time from 10 to 200 microseconds, corrects from 190-900nm. The 205AAS Does not feature D2 Background correction
Burner / Nebulizer:	Polypropylene spray chamber with pre-mix burner and high efficiency adjustable nebulizers (SS), Titanium burner heads for Air/Acetylene, Argon/ Hydrogen and Nitrous Oxide/Acetylene operation.
Microprocessor:	Computer control by 80C188 chip, 8/16 bit operation, 12/24 MHz clockspeed; non-volatile SRAM storage of >200 method files.
Integration / Response Range:	User selectable times from 0.5 to 10 seconds for continuous (flame) and transient (furnace, hydride) signals.
Calibration:	Automatic, weighted least squares fit to 1st, 2nd, 3rd, or 4th order functions, up to 8 points.
Display:	16-line backlit liquid crystal display for all text and graphics
Output Modes:	LCD display, IEEE-488 Parallel port for dot-matrix printer, RS-232 Serial port
Dimensions / Weight:	39"L x 11"W x 12"H; 50 lbs (81 lbs shipping weight)
Power Supply:	100-240 VAC operating range, 50/60 Hz AC, <150 watts

220 Graphite Furnace Atomizer

Temperature Range:	Ambient to 3000°C
Heating Rate:	Approximately 3000°C per second
Programming Steps:	Up to 20 user-definable phases
Heating Cycles:	Dry ramp and hold, ash ramp and hold, atomize ramp and hold, burn-off ramp and hold
Control Cycles:	Data collection, internal gas flow, “mini” internal gas flow, alternate gas flow
Purge Gas:	Pre-purified Argon at 1.5-2L per min. Alternate gases: Air, O_2, or H_2
Cooling Water:	Continuous tap or cooled recirculating flow at 1L per minute
Dimensions/Weight:	6"L x 12"W x 20"H; 35 lbs (40 lbs shipping weight)
Power Supply:	208-240 volts/30amp, 50/60Hz, <5Kw typical load

Autosampler Options

Model 220AS Furnace AS

Type:	Random-access circular carousel, sample pick-up by dip-probe arm
Flow Control:	Precision variable micro-syringes, 100µL (sample) and 2mL (rinse)
Functions:	Self-start checkout, sample, rinse, and hold modes, auto-zero, auto-cal, and QC
Injection Cycles:	Blanks, standards, QC controls and matrix modifiers from 1µL to 50µL; user programmable
Tray Positions:	48 cup total; 40 samples and 8 calibrations/modifiers in rotating carousel; user programmable
Interfacing:	Direct RS-232C communications with 210VGP system
Dimensions / Weight:	12"L x 12"W x 12"H; 28 lbs (35 lbs shipping weight)
Power Supply:	110V/10A or 208-240V/5A; 50/60Hz

Model 240 Flame AS

Type:	X/Y Table Random-access, sample pick-up by dip-probe arm
Flow Control:	Variable peristaltic pump or direct aspiration via nebulizer adjustment
Functions:	Self-start checkout, sample, rinse, and hold modes
Sample Pick-up Control:	Programmable probe depth from 0mm (bottom of cup) to 130mm (above tray)
Tray Positions:	150 cups in 275mm x 211mm tray area + 10 calibration cups
Interfacing:	Direct RS-232C communications with 210VGP system
Dimensions / Weight:	10"L x 15"W x 12"H; 30 lbs (37 lbs shipping weight)
Power Supply:	110V/10A or 208-240V/5A; 50/60Hz

Perfect for EPA methods 245.1 ~ 745.7 ~ 1631

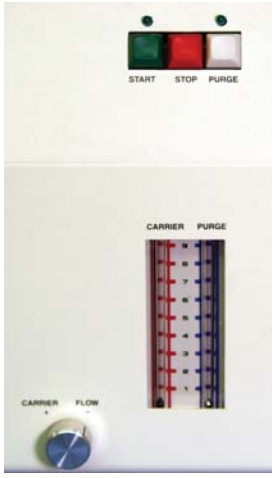
Overview

The Model 410 Mercury Analyzer System incorporates the Hatch & Ott Cold Vapor Technique for the analysis of trace levels of mercury in drinking, surface and saline waters, as well as domestic and industrial wastes.

Features:

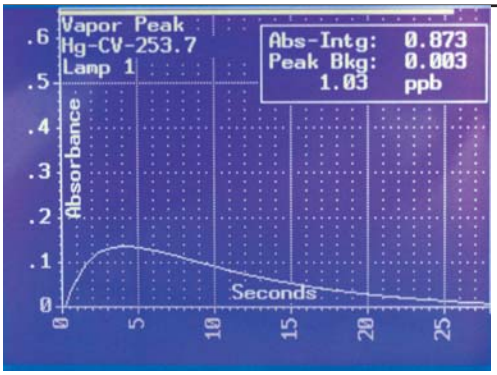
- Detection limit 10 PPT based on 250 ml sample Aliquot.
- Absolute mass 0.0025 mg (2.5 ng)
- 400mm Flowcell for lower detection levels
- Direct printout for 21-CFR part 11 compliance and optional data transfer software for PC data storage.
- Complete analytical system includes Hg Cold Vapor Kit
- Affordable price perfect for labs with limited budget
- Quick analysis and recovery time
- Up to eight point calibration curve
- Push button *Quick-Purge* for flow cell flushing
- RS232, Printer and analog recorder output
- Simple to use with minimal operator training
- D2 Background correction for interference free measurement

The 410 produces results comparable to Atomic Fluorescence systems at 1/3rd the cost



Gas flow control panel

Summary of Method



This method is based on the absorption of radiation by mercury vapor at the 253.7nm line. The mercury is first reduced to the elemental state using the procedure outlined in the EPA method Air is then bubbled through the sample, speeding the mercury vapor to the absorption cell. The 253.7nm mercury line emitted by the lamp is absorbed by the vapor in the cell in proportion to the mercury concentration. The result is transmitted to the digital readout which can be read directly in concentration of mercury. The instrument has a built-in "Peak-Picker" which reads peak area. The operator records this reading before purging. The instrument is then ready for the next sample.

Specifications

Detection Limits: 10 PPT /2.5 ng
Absorption Cell: 400 mm pathlength with silica windows
Power Requirements: 115/220V.A.C, 50/60Hz, 80 watts
Dimensions: 39"W x 11"D x 12"H

Weight: 45 lbs.
Output:: RS232 and Analog
Background Correction: In-line Deuterium Lamp
Delivery system: Includes air dryer and charcoal filter

411 Arsenic Hydride Analyzer

Designed to meet the requiremnts for EPA - SW846, NPDES / RCRA and 200.7 / 200.9 methods

Overview

Using the established platform from the Buck 210 Series AAS. The Unique Model 411 system provides high throughput determination of Arsenic from prepared water and solid waste samples using an integrated continuous flow hydride generator and electrically heated quartz tee tube for combustion of the hydride material for sub-PPB sensitivities in the most compact dedicated package.

Features:

- Provides detection limits of 500 parts per trillion (0.5 parts per billion.)
- Enclosed, electrically heated quartz tee tube provides safe reaction of hydride generation products to give stable, hi energy arsenic signals.
- Fully Integrated continuous flow hydride system provides simple operation with real-time sample data.
- Can be used with low cost technical grade argon or nitrogen purge gas with complete flow meter controls on instrument for optimizing the data.
- Internal software capable of multi-port linear and quadratic calibration curves with statistical analysis of sample data.
- Direct printout for 21-CFR part 11 compliance and optional data transfer software for PC data storage.
- Easy to operate with virtually nothing to adjust
- Unique in-line Deuterium corrector provides superior energy compared to any other arsenic method for the best accuracy and freedom from interferences
- Toll-free technical assistance and on-line application support.

Summary Of Technology

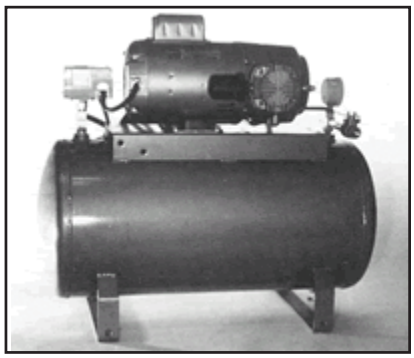
Typical Arsenic analytical methods usually involve either the time-consuming modification of an existing Flame AAS to accommodate a hydride cell or using a costly graphite furnace AAS to reach low PPB levels needed for most environmental screening and remediation testing. The well known hydride generation reaction (based on the classic 100+ year old marsh test for arsenic) provides the best detection limits, since it serves to concentrate the arsenic and isolate it from any sample matrix. Tests can be performed with excellent reliability and throughput using the continuous flow method where the sample solution is pre-mixed with the appropriate hydrochloric sulfuric acid matrix then reacted with the strong sodium Borohydride reducing agent to create arsine (volatile arsenic hydride) and free hydrogen. This gas reaction is passed through the quartz cell heated over 600º to form free arsenic atoms which absorb the D2 corrected light from the Buck hi through output arsenic hollow cathode lamp to produce precise sub PPB level data in less than 60 seconds with the push of a button.

Specifications:

Detection Limits:	500PPT (based on standard peristaltic pump tubing)
Reaction Cell:	150mm Annealed Quartz T-Tube, sealed Electrical Heater
Power requirements:	110V/20A for U.S. operation & 220V / 10A for International
Dimensions:	39” X 11” X 12”
Weight:	60Lbs.
Output:	Printer (parallel port) Digital (RS-232) and 1V analog
Background Correction:	In-Line Deuterium lamp (automatic compensation)
Reaction System:	Peristaltic pump with phase separation glassware & gas delivery lines

AAS Installation Supplies

Air Compressors



BS303-0313	115 VAC Air compressor, pressure switch mounted and wired, safety valve, pressure gauge, manual drain, electrical cord and plug 12 gallon manual on/off valve, delivers 1.8 CFM @ 60 PSI.
BS303-0314	220 VAC Air Compressor
BS303-0229	Balston Air Filter to remove oil, water and particles from compressed air. supplied with fitting for connecting 1/4" line, plus 10 ft. of 1/4" tygon tubing.
BS057-2471	Replacement cartridge for above filter.
11038	Wall mounting bracket for above filter

Ventilation Kits

BS303-0407	Hood And Vent Kit 110V
BS303-0417	Hood And Vent Kit 220V
116-1000	Stainless Steel Blower Adapter
116-1001	Stainless Steel Exhaust Hood
116-1002	Stainless Steel Sleeve - Connects two hoses
999-3053	Stainless Steel Hose Clamp
999-3075	Flexible stainless steel hose 4" X 10 feet
999-3076	Blower - 265 CFM 115V/60Hz
999-3077	Blower - 265 CFM 220V/50Hz

Flexible Tubing For Gas Lines

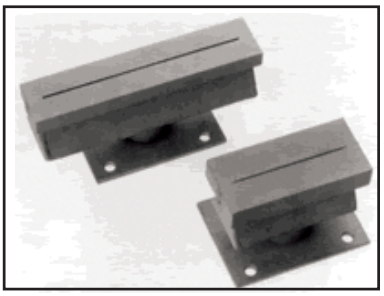
990-1855	Black Flexible Tubing w/ nuts & ferrules (per/ ft.)
990-1857	Blue Flexible Tubing for Nitrous Oxide Line (per/ft.)
990-1856	Red Flexible Tubing for Acetylene Line (per/ft.)

Regulators

BS303-0106	Acetylene Pressure Regulator
BS303-0263	Air Pressure Regulator
BS303-0264	Argon Pressure Regulator
R06-221	Pressure Regulator with gauge
BS303-0265	Hydrogen Pressure Regulator
BS303-0204	Nitrous Oxide Pressure Regulator

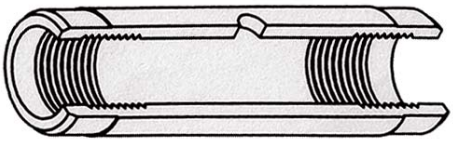
Burner Accessories

BS30040	210 VGP Spare Parts Kit
BS30041	Accusys 211 Spare Parts Kit
210-0541	205/210 Nitrous Oxide Burner Head
210-0542	205/210 Acetylene Burner Head
210-0632	Accusys 211 Acetylene Burner Head
210-0631	Accusys 211 Nitrous Oxide Burner Head
999-2202	Burner head slot cleaner
200-0056	Stainless Steel Nebulizer
200-0060	Corrosion Resistant Nebulizer
BS303-0135	Nebulizer Cleaning Wire
BS990-8265	Nebulizer Capillary Tubing 10'
991-1047	Flame Ignitor
BS30055	Atomic Absorption Spectrometry Book



Graphite Furnace Accessories

BS290-1820	Non-pyro coated graphite tubes [10 pack]
BS007-0699	Non-pyro coated graphite tubes [50 pack]
BS013-5653	Pyro coated graphite tubes [10 pack]
BS009-1504	Pyro coated graphite tubes [50 pack]
BS220-2697	Platform graphite tubes [10 pack]
BS008-7056	Polyethylene sample cups for furnace autosampler [1000/pk]
BS011-9079	Polystyrene sample cups for furnace autosampler [1000/pk]
220-3056	Polystyrene 8.5mL Sample Cups (pkg 50)
204-1044	Left Contact Ring
204-1045	Right Contact Ring



Buck 1 1/2" High Energy Hollow Cathode Lamps

The Quality of any instrumental analyses is dependent on the quality of the components of the instrument. At Buck Scientific, we strive to maximize the quality of all aspects of analytical instrumentation, from the main system itself to the smallest accessory.

In Atomic Absorption analysis, the Hollow Cathode Lamp provides the initial signal from which the analytical reading is taken. The stability and energy of the lamp becomes integral in achieving precise results. Buck lamps are made to produce a clean, stable atomic signal of high energy, so the instrument can obtain peak signals from the sample.

Buck Hollow cathode lamps are manufactured with high performance components and strict Quality Assurance guidelines which results in a lamp that prevents sputtering or depositions. Both of which have been known to adversely effect instrument readings and reduce lamp life.

Buck Puro-graphic™ Standard Solutions

Buck Scientific, Inc. provides a complete line of Standard Solutions in various grades and Spectroscopic Reagents for use in Flame, Furnace, Cold Vapor and Hydride A.A. analyses. Buck Solutions are prepared from specially purified starting materials, 18 MegOhm Water and high purity CMOS grade acids to provide the lowest levels of contaminants and interfaces. All our standards are traceable to N.I.S.T., A.S.T.M. and I.U.P.A.C.. The organic-based standards are synthesized from pure carboxylic acids and high-purity inorganic salts. Buck employs stabilizing matrices that allow analysts to mix standards and make spike additions without significant errors or incompatibilities.

Lamp & Standard Solution Guide

Element	Symbol	Primary(nm)	Slit Setting	1½" P/N	2"P/N (Pre Analyst Series)	Aqueous Stnd Sol. P/N
Aluminum	**Al**	309.3	7	4101	5001	AQ-Al
Antimony	**Sb**	206.8	2	4102	5002	AQ-Sb
Arsenic	**As**	193.1	7	4103	5003	AQ-As
Barium	**Ba**	553.5	7	4104	5004	AQ-Ba
Beryllium	**Be**	234.9	7	4105	5005	AQ-Be
Bismuth	**Bi**	223.1	7	4106	5006	AQ-Bi
Boron	**B**	249.8	7	4107	5007	AQ-B
Cadmium	**Cd**	228.8	7	4108	5008	AQ-Cd
Calcium	**Ca**	422.7	7	4110	5010	AQ-Ca
Cerium	**Ce**	520.0	7	4009	5009	AQ-Ce
Cesium	**Cs**	852.1	2	4111	5011	AQ-Cs
Chromium	**Cr**	357.9	7	4112	5012	AQ-Cr
Cobalt	**Co**	240.7	2	4113	5013	AQ-Co
Copper	**Cu**	324.7	7	4114	5014	AQ-Cu
Dysprosium	**Dy**	419.5	2	4115	5015	AQ-Dy

Lamps & Standards Continued

Element	Symbol	Primary(nm)	Slit Setting	1½" P/N	2" P/N	Stnd Sol
Erbium	**Er**	400.8	2	4116	5016	AQ-Er
Europium	**Eu**	459.4	2	4117	5017	AQ-Eu
Gadolinium	**Gd**	407.9	2	4118	5018	AQ-Gd
Gallium	**Ga**	287.4	7	4119	5019	AQ-Ga
Germanium	**Ge**	256.2	2	4120	5020	AQ-Ge
Gold	**Au**	242.8	7	4121	5021	AQ-Au
Hafnium	**Hf**	304.0	2	4122	5022	AQ-Hf
Holmium	**Ho**	410.4	2	4123	5023	AQ-Ho
Hydrogen	**H**	*	*	4124	5024	N/A
Indium	**In**	304.0	7	4125	5025	AQ-In
Iridium	**Ir**	208.9	2	4126	5026	AQ-Ir
Iron	**Fe**	248.3	2	4127	5027	AQ-Fe
Lanthanum	**La**	550.1	2	4128	5028	AQ-La
Lead	**Pb**	217.0	7	4129	5029	AQ-Pb
Lithium	**Li**	670.8	7	4130	5030	AQ-Li
Luteium	**Lu**	335.9	2	4131	5031	AQ-Lu
Magnesium	**Mg**	285.2	7	4132	5032	AQ-Mg
Manganese	**Mn**	279.5	7	4133	5033	AQ-Mn
Mercury	**Hg**	253.7	7	4134	5034	AQ-Hg
Molybdenum	**Mo**	313.3	7	4135	5035	AQ-Mo
Neodymium	**Nd**	463.4	2	4136	5036	AQ-Nd
Nickel	**Ni**	232.0	2	4137	5037	AQ-Ni
Niobium	**Nb**	334.4	2	4138	5038	AQ-Nb
Osmium	**Os**	290.9	2	4139	5039	AQ-Os
Palladium	**Pd**	247.6	2	4140	5040	AQ-Pd
Phosphorus	**P**	178.3	2	4141	5041	AQ-P
Platinum	**Pt**	265.9	2	4142	5042	AQ-Pt
Potassium	**K**	766.5	7	4143	5043	AQ-K
Praseodymium	**Pr**	495.1	2	4144	5044	AQ-Pr
Rhenium	**Re**	346.1	2	4145	5045	AQ-Re
Rhodium	**Rh**	343.5	2	4146	5046	AQ-Rh
Rubidium	**Rb**	780.0	7	4147	5047	AQ-Rb
Ruthenium	**Ru**	349.9	2	4148	5048	AQ0Ru
Samarium	**Sm**	429.7	2	4149	5049	AQ-Sm
Scandium	**Sc**	*	2	4150	5050	AQ-Sc
Selenium	**Se**	196.0	2	4151	5051	AQ-Se
Silicon	**Si**	251.6	2	4152	5052	AQ-Si
Silver	**Ag**	328.1	7	4153	5053	AQ-Ag
Sodium	**Na**	589.0	2	4154	5054	AQ-Na
Strontium	**Sr**	460.7	2	4155	5055	AQ-Sr

Element	Symbol	Primary(nm)	Slit Setting	1½" P/N	2" P/N	Stnd Sol
Tantalum	**Ta**	271.4	2	4156	5056	AQ-Ta
Tellurium	**Te**	214.3	7	4157	5057	AQ-Te
Terbium	**Tb**	*	2	4158	5058	AQ-Tb
Thallium	**Tl**	276.8	7	4159	5059	AQ-Tl
Thorium	**Th**	371.9	*	4160	5060	AQ-Th
Thulium	**Tm**	371.8	2	4161	5061	AQ-Tm
Tin	**Sn**	235.5	7	4162	5062	AQ-Sn
Titanium	**Ti**	365.4	2	4163	5063	AQ-Ti
Tungsten	**W**	255.1	2	4164	5064	AQ-W
Uranium	**U**	358.5	2	4165	5065	AQ-U
Vanadium	**V**	318.5	2	4166	5066	AQ-V
Ytterbium	**Yb**	398.8	2	4167	5067	AQ-Yb
Yttrium	**Y**	410.2	2	4168	5068	AQ-Y
Zinc	**Zn**	213.9	7	4169	5069	AQ-Zn
Zirconium	**Zr**	360.1	2	4170	5070	AQ-Zr

Multi-Element HCL's

Elements	1½" P/N	2" P/N
Ca/Mg	4226	5075
Cu/Zn	4227	5076
Al/Sr	4228	5077
Ag/Cd	4229	5078
Cu/Be	4230	5079
Na/K	4231	5080
Al/Sn	4232	5081
Pt/Rh	4233	5082
Se/Sn	4234	5083
Cu/Fe/Mn/Zn	4312	5084
Cu/Co/Cr/Mn/Ni	4262	5085
Cu/Co/Fe/Mn/Mo	4313	5086
Cu/Co/Cr/Ni/Ag	4314	5087
Cu/Co/Cr/Fe/Mn/Ni	4264	5088