



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

# Request for Quotation

RFQ NUMBER  
 DEP15345

PAGE  
 1

ADDRESS CORRESPONDENCE TO ATTENTION OF  
 CHUCK BOWMAN  
 304-558-2157

RFQ COPY  
 TYPE NAME/ADDRESS HERE

*BRUKER DALTONICS*

ENVIRONMENTAL PROTECTION  
 DEPARTMENT OF  
 OFFICE OF AIR QUALITY  
 601 57TH STREET  
 CHARLESTON, WV  
 25304 304-926-3647

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
02/17/2011				

BID OPENING DATE: 03/17/2011 BID OPENING TIME 01:30PM

LINE	QUANTITY	UCP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		493-04	137,600.00	137,600.00
<p>INDUCED COUPLED PLASMA-MASS SPECTROMETER</p> <p>THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, IS SOLICITING BIDS FOR A PERKIN ELMER NEXION 300X (OR EQUAL) INDUCTIVELY COUPLED PLASMA MASS SPECTROMETER PER THE FOLLOWING SPECIFICATIONS, BID REQUIREMENTS, TERMS &amp; CONDITIONS AND THE ATTACHED BID SCHEDULE.</p> <p>VENDORS BIDDING AN 'OR EQUAL' TO THE MANUFACTURER AND MODEL NUMBER NOTED ABOVE SHOULD IDENTIFY THE MANUFACTURER AND MODEL NUMBER BEING BID AS WELL AS SUBMITTING PERTINENT SPECIFICATION AND PERFORMANCE INFORMATION TO ALLOW THE AGENCY TO SUFFICIENTLY EVALUATE THE PROPOSED INSTRUMENT FOR EQUALITY TO THE SPECIFICATIONS AS ADVERTISED. THE AGENCY RESERVES THE RIGHT TO REQUEST ADDITIONAL INFORMATION FROM ANY VENDOR AT ANY TIME DURING THE EVALUATION PROCESS. FAILURE OF ANY VENDOR TO PROVIDE THE REQUESTED INFORMATION WITHIN THE TIME FRAME REQUESTED MAY RESULT IN THE DISQUALIFICATION OF THE VENDORS BID AND ANY CONSIDERATION FOR AWARD.</p> <p>WARRANTY, DELIVERY, SETUP, AND TRAINING REQUIREMENTS ARE NOTED IN THE ATTACHED SPECIFICATIONS.</p> <p>THE MODEL/BRAND/SPECIFICATIONS NAMED HEREIN ESTABLISH THE ACCEPTABLE LEVEL OF QUALITY ONLY AND ARE NOT INTENDED TO REFLECT A PREFERENCE OR FAVOR ANY PARTICULAR BRAND OR VENDOR. VENDORS WHO ARE BIDDING ALTERNATES SHOULD SO STATE AND INCLUDE PERTINENT</p>						

RECEIVED  
 FEB 23 AM 9:21  
 PURCHASING

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE *[Signature]* TELEPHONE 703-989-9212 DATE 3/21/11

TITLE ACCT MANAGER FEIN 33-1064877 ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

**GENERAL TERMS & CONDITIONS  
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)**

1. Awards will be made in the best interest of the State of West Virginia.
2. The State may accept or reject in part, or in whole, any bid.
3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required \$125 fee.
4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.
5. Payment may only be made after the delivery and acceptance of goods or services.
6. Interest may be paid for late payment in accordance with the *West Virginia Code*.
7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.
8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.
10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.
11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.
12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.
13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at [www.state.wv.us/admin/purchase/vrc/hipaa.htm](http://www.state.wv.us/admin/purchase/vrc/hipaa.htm) and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.
14. **CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.
15. **LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.
16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or Fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

**INSTRUCTIONS TO BIDDERS**

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.
2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.
3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.
4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130
5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

### Request for Quotation

RFQ NUMBER  
 DEP15345

PAGE  
 2

ADDRESS CORRESPONDENCE TO ATTENTION OF:  
 CHUCK BOWMAN  
 304-558-2157

VENDOR

RFQ COPY  
 TYPE NAME/ADDRESS HERE

*BRUKER DALTONICS*

S.P.T.O.

ENVIRONMENTAL PROTECTION  
 DEPARTMENT OF  
 OFFICE OF AIR QUALITY  
 601 57TH STREET  
 CHARLESTON, WV  
 25304 304-926-3647

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
02/17/2011				

BID OPENING DATE: 03/17/2011 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>LITERATURE AND SPECIFICATIONS. FAILURE TO PROVIDE INFORMATION FOR ANY ALTERNATES MAY BE GROUNDS FOR REJECTION OF THE BID. THE STATE RESERVES THE RIGHT TO WAIVE MINOR IRREGULARITIES IN BIDS OR SPECIFICATIONS IN ACCORDANCE WITH SECTION 148-1-4(F) OF THE WEST VIRGINIA LEGISLATIVE RULES AND REGULATIONS.</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION          PURCHASING DIVISION          BUILDING 15          2019 WASHINGTON STREET, EAST          CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: CB-23</p> <p>RFQ. NO.: DEP15345</p> <p>BID OPENING DATE: 03/17/2011</p> <p>BID OPENING TIME: 1:30 PM</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID: 703-991-1409</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>[Signature]</i>	TELEPHONE 703-989-4212	DATE 3/21/11
TITLE <i>ACT MANAGER</i>	FEIN 33-1064877	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

# Request for Quotation

RFQ NUMBER  
 DEP15345

PAGE  
 3

ADDRESS CORRESPONDENCE TO ATTENTION OF  
 CHUCK BOWMAN  
 304-558-2157

RFQ COPY  
 TYPE NAME/ADDRESS HERE  
 BRUKER DALTONICS

ENVIRONMENTAL PROTECTION  
 DEPARTMENT OF  
 OFFICE OF AIR QUALITY  
 601 57TH STREET  
 CHARLESTON, WV  
 25304 304-926-3647

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
02/17/2011				

BID OPENING DATE: 03/17/2011 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
CONTACT PERSON (PLEASE PRINT CLEARLY): GEORGE MANNING 703-989-4212 cell 703-991-1409 fax						
***** THIS IS THE END OF RFQ DEP15345 ***** TOTAL:						137,600.00

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE *[Signature]* TELEPHONE 703-989-4212 DATE 2/21/11  
 TITLE ACCT MANAGER FEIN 33-1064877 ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

**Request for  
 Quotation**

RFQ NUMBER
DEP15345

PAGE
1

ADDRESS OR RESPONDENCE TO ATTENTION OF:
CHUCK BOWMAN 304-558-2157

\*528140355 978-663-3660  
 BRUKER DALTONICS INC  
 40 MANNING RD  
 BILLERICA MA 01821

ENVIRONMENTAL PROTECTION  
 DEPARTMENT OF  
 OFFICE OF AIR QUALITY  
 601 57TH STREET  
 CHARLESTON, WV  
 25304 304-926-3647

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
03/10/2011				

BID OPENING DATE: 03/23/2011 BID OPENING TIME: 01:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
				ADDENDUM NO.1		
				ADDENDUM ISSUED FOR THE INDUCED COUPLED PLASMA-MASS SPECTROMETER TO DISTRIBUTE THE FOLLOWING REVISED SPECIFICATIONS. PLEASE REPLACE THE ORIGINAL SIX(6) PAGES OF SPECIFICATIONS WITH THE ATTACHED SIX(6) PAGES.		
				BID OPENING DATE AND TIME ARE EXTENDED FROM 03/17/2011 TO 03/23/2011 AT 1:30 PM.		
				***** NO OTHER CHANGES *****		
0001	1	EA		493-04		
				INDUCED COUPLED PLASMA-MASS SPECTROMETER		
				***** THIS IS THE END OF RFQ DEP15345 *****		
				TOTAL:		\$137,600.00

SEE REVERSE SIDE FOR TERMS AND CONDITIONS		
SIGNATURE	TELEPHONE	DATE
<i>[Signature]</i>	703-989-4212	3/21/11
TITLE	FAX	AT DRESS CHANGES TO BE NOTED ABOVE
ACCOUNT MANAGER	33-1064877	

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

# Bruker Response to RFQ DEP15345

This is Bruker's response to RFQ DEP15345. Bruker is bidding the Bruker 820MS ICPMS. This is an equal to the Perkin Elmer Nexion 300X as specified in the bid documents provided. The 820MS is functionally equivalent or superior to the Nexion 300X. A sales brochure and specification sheet have been included with this bid package to verify statements made.

The Bruker 820MS in this response meets or exceeds all bid specifications outlined except:

## Section A

11 The Bruker 820MS is not a bench top system. It is a floor mounted ICPMS with dimensions outlined in the specification sheet attached. All ICPMS's must have roughing pumps to establish rough vacuum before the turbomolecular pump spins up. Bruker puts these in the cabinet to reduce oil vapor emissions into the lab for technician safety.

## Section D

27 The ion deflector specified in the bid is a Perkin Elmer patented technology. Bruker instead uses the Bruker (Varian) patented 90 degree ion mirror mounted inside the vacuum chamber to achieve the same removal of chemical noise. However, the Bruker ion mirror also focuses the ion beam to enhance sensitivity. This feature is detailed in the attached brochure.

The Bruker 820MS is technically superior to the Perkin Elmer Nexion 300X specified in the RFQ documents with features that include:

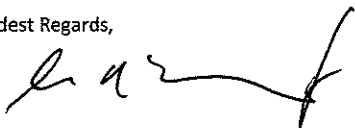
Patented focusing ion mirror to remove chemical noise (photons, neutrals, etc.)

All digital detector with nine (9) orders of magnitude linearity without having to use complex detector switching algorithms as used in the Nexion 300X

Patented Collision Reaction Interface (CRI) with the cell existing as part of the sample and skimmer cone assembly. This design requires no extra maintenance other than cleaning the cones as with any other commercially available ICPMS. The CRI interface is in the hottest, highest pressure zone of the ICPMS for enhanced sensitivity and only uses helium and hydrogen gases.

We thank you for the opportunity to respond to the above named RFQ. Should you have any question or concerns, please contact me.

Kindest Regards,



**Bruker Daltonics Chemical and Applied Markets**

---

**George Manning**  
Regional Account Manager

Bruker Daltonics  
Chemical Analysis  
2859 Bayview Dr.  
Fremont, CA 94538  
USA

Phone: 703-989-4212  
Fax: 703-991-1409

[george.manning@bruker.com](mailto:george.manning@bruker.com)  
[www.bruker.com](http://www.bruker.com)

**Bid Schedule  
DEP15345**

Company Name: BRUKER DALTONICS

Address: 2859 BAYVIEW DRIVE

FREMONT CA 94538

The DEP reserves the right to request additional information and supporting documentation regarding unit prices when the unit price appears to be unreasonable.

ITEM NO.	* QUANTITY	DESCRIPTION	EA	TOTAL
1.0	1	Inductively Coupled Plasma Mass Spectrometer		\$ 123,600
2.0	1	Extended Warranty, One Year		\$ 14,000
<b>TOTAL</b>				<b>\$ 137,600</b>

If bidding an "or equal" to the basis of the specification, please indicate the manufacturer and model number in the space provided below:

BRUKER 820 MS ICPMS

Signature: 

Date: 3/21/11



Bruker Daltonics Inc. -

Environmental Protection Department  
Office of Air Quality  
601 57th Street  
Charleston WV 25304  
304-926-3647

Department of Administration  
Purchasing Division  
2019 Washington Street East  
Charleston WV 25305

Bruker Daltonics Inc.  
Chemical and Applied Markets  
2859 Bayview Drive  
Fremont, CA 94538  
Phone 877.442.2231  
Fax 925.942.4745  
www.bdal.com

Quote No.: QUO-03747-X5H9VS.0  
Quote Date: 2011-03-21  
Quote Expires: 2011-04-21

Quote prepared by  
Mr. George Manning  
Phone 703-989-4212  
Fax 703-991-1409  
george.manning@bruker.com

Item	Part No.	Description	Amount	Sum Price USD
1	10087801-CAD	<b>Bruker 820-MS SINGLE PHASE USA</b>  The Bruker 820-MS is a compact, floor-mounted Inductively Coupled Plasma Mass Spectrometer (ICP-MS) with full PC control of all instrument settings and compatible accessories. It features a patented 90 degree reflecting ion optics system for gigahertz sensitivity (1000 Mc/s/mg/L) and low background and interferences. The Bruker 820-MS system includes a sample introduction system, solid state 27 MHz RF generator, and patented Turner Interlaced Coils. Full PC control of plasma positioning, triple stage vacuum system, all plasma gas flows, mass analyzer, and Discrete Dynode Electron Multiplier (DDEM) detector is also included. The vacuum system is fully contained within the instrument for the smallest instrument footprint. Unique DDEM detector provides nine decades of dynamic range in an all-digital pulse design. Fully web-integrated ICP-MS Expert software uses Bruker's worksheet concept for ease of use, rapid operator training, and commonality with other Bruker spectroscopy products. The Bruker 820-MS system includes Bruker's unique Collision Reaction Interface (CRI) providing fast, flexible, interference-free analysis using simple collision and reaction gases. The CRI reduces interferences by injecting simple collision and reaction gases (helium or hydrogen) into the plasma as it passes through the orifice of the cones. Gas may be injected through the sampler cone, skimmer cone, or both. All CRI gas flows controlled by mass flow controllers. Rapid switchover between gas on and gas off, or between different collision and reaction gases. Includes External Sample Introduction Assembly (ESIA) with Peltier-cooled Scott type double-pass glass spraychamber (PC-controlled variable temperature for enhanced stability and reduced oxide ion interferences), low (400 microliter/min) glass nebulizer and fully PC-controlled variable speed 3-channel peristaltic pump. Mounted outside the torch box to eliminate temperature-induced drift. Features rapid start-up, easy access for maintenance and cleaning, and rapid switchover to accessories. One button automated optimization of all gas flows, including CRI gases.	1	





Quote No.: QUO-03747-X5H9VS.0

Item	Part No.	Description	Amount	Sum Price USD
		<p>27.12 MHz solid-state, air-cooled, crystal locked RF generator in main instrument housing (600-1600 W in 10W increments). Optimum power setting automatically defined and stored within each method. Automatic ignition and shutdown of plasma with user-customizable ignition sequence. Automatic optimization of plasma parameters with full PC control of horizontal, vertical and sampling depth (Z position) of plasma for maximum sensitivity and minimum polyatomic interferences. One-piece, low flow, ball-and-socket connection torch. Patented Turner Interlaced Coils minimize polyatomic interferences without the use of a mechanical torch shield in cool plasma mode.</p> <p>Plasma interface designed for easy access and removal of sampler and skimmer cones. One set of C-series high performance nickel cones and one set of CRI nickel cones provided as standard. Water-cooled plasma interface including individual, independent cooling of the cones for faster warm-up, improved stability and faster cool down.</p> <p>Patented ion mirror reflects analyte ion beam through 90 degrees while photons and neutrals pass to the vacuum system. Ion mirror creates parabolic electrostatic field to focus the analyte ions with optimum efficiency at the quadrupole entrance aperture. Results in gigahertz sensitivity (1000 Mc/s/mg/L). Ion optics feature easy access to extraction lens 1 and 2 for cleaning without breaking vacuum. Auto-optimization of all ion optics settings, including ion mirror, based on selected optimization criteria. Quadrupole mass analyzer is off-axis using patented curved, self-cleaning stainless steel entrance rods to ensure low background by further eliminating excited neutrals before the quadrupole.</p> <p>Vacuum system includes two rotary (SD602 and SD302) and two V-301 turbomolecular pumps for efficient pumping and to eliminate excessive pump wear. All vacuum pumps are located in the main instrument housing to reduce noise and eliminate extra floor or bench space requirements. Rotary pumps are mounted on pull-out slides for easy access and maintenance. Turbomolecular pumps feature maintenance-free ceramic bearings. Gate valve between the first and second vacuum stages automatically closes in the event of a power failure.</p> <p>Quadrupole features precision-machined, stainless steel, round rods locked into ceramic mounts for a near-perfect hyperbolic field. Stainless steel construction permits determination of Hg without high memory. Patented curved entrance rods provide a double off-axis design and low background signals. All voltages are fully interlocked and under PC control. Solid-state, air-cooled power supply. Built-in, multi-channel scaler provides up to 40 channels per mass. Range of 3 to 256 amu with 'zero blast' protection and adjustable resolution (0.5 to 1.2 amu). Mass calibration stability - 0.05 amu per day; quadrupole RF frequency - 3.0 MHz; scan speed - 2000 amu/s; quadrupole settling time - &lt;400 microseconds; minimum dwell time - 200 microseconds.</p> <p>Standard all-digital ETP AF250 Discrete Dynode Electron Multiplier (DDEM) provides nine decades of linear dynamic range in an all-pulse-counting detector. No complex, time-consuming analog-to-digital cross calibrations are required. Measuring dynodes are mounted off-axis for reduced background. One-year warranty provided on DDEM detector. Typical 820-MS hot plasma high sensitivity mode performance, Mc/s/mg/L - 9Be &gt;50, 115In &gt;1000, 232Th &gt;300. Precision (10 replicates, 20 minutes) &lt;3%; oxide ions CeO+/Ce+ &lt;3%; doubly charged ions Ba++/Ba+ &lt;3%; background (at 5 amu) &lt;5 c/s. Abundance sensitivity - 10-6 low, 10-7 high on 23Na. Isotope ratio precision &lt;0.1%. CRI interference reduction - 1 microgram/L As readback in 1% HCl, 1 microgram/L +/- 0.1 microgram/L.</p> <p>Complete ICP-MS Expert operating software compatible with Windows XP is included. Easy-to-use worksheet software - a web-integrated design. The software provides fully automated operation of the instrument for functions such as optimization, sample analysis, data collection, and</p>		



Quote No.: QUO-03747-X5H9VS.0

Item	Part No.	Description	Amount	Sum Price USD
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reporting in a user-friendly interface. Features Wizards that guide users through method and sequence development, and method templates for rapid development of commonly used methods. AutoMax makes method development easy by automating all ion optics, nebulizer, plasma and CRI settings for optimum results. ICP-MS Expert switches automatically between multiple method condition sets within a single sample, giving optimum performance for specific element suites, without having to re-run samples. Each worksheet cell provides all results including concentrations, intensities, statistics, replicate readings and graphical mass scans. Some of the additional software features include - high speed Time Resolved Signal (TRS) capability, seamless LC-ICP-MS integration using Bruker Galaxie™ chromatographic software, fully automated instrument initialization (start-up) routine, simultaneous real-time display of signals for multiple isotopes or ratios, post-run data editing and comprehensive instrument diagnostics and performance tests. ICP-MS Expert Quality Control Protocols (QCP) can be customized to your needs. Includes compatible methods for US EPA 6020, 200.8 and 1638. A dynamic instrument Status window provides a quick visual check of the status of all system components - an excellent diagnostic tool that maximizes instrument up time.

A range of options are available for the 820-MS - SPS3 high-throughput autosampler, diluter (automatic on-line dilution or intelligent off-line solution preparation), productivity pack, integrated speciation (LC-ICP-MS), clean room pack, vapor generation, microconcentric nebulizers and laser ablation. Inert PFA nebulizer, spraychamber, semi-demountable torch with inert Pt injector tube, inert PFA transfer lines and platinum tipped cones are available.

The Bruker 820-MS single-phase instrument is powered by two single-phase 200-240 V AC, 30 amp, 50-60 Hz supplies. Further installation requirements are covered in the pre-installation manual, Bruker publication number 8510206700.

The Bruker 820-MS system is supplied with operation manual, assorted spares, tools and ICP-MS tuning solution (0190024400). Requires, but does not include compatible controlling computer and water chiller.

Includes installation and one year factory warranty.

Includes 3 days of onsite or offsite training.

2	7910048200-CAD	ICP-MS WATER COOLER, 230VAC, 60HZ	1	
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3450 watt capacity recirculating chiller for use with 810/820-MS and Bruker ICP-MS. Lytron Kodiak Recirculating Chiller RC030J03BF2C008. Includes positive displacement pump, hot gas bypass, microprocessor temperature controller and plastic barb fittings. 208/230 VAC, 60 Hz, single phase, 14.5 Amps.



Quote No.: QUO-03747-X5H9VS.0

Item	Part No.	Description	Amount	Sum Price USD
3	0190024400-CAD	<b>Tuning Solution</b>  Bruker ICP-MS Tuning Solution, 250 mL. Contains 10 ug/mL Ba, Be, Ce, Co, In, Pb, Mg, Tl and Th. (250 mL supplied with ICP-MS instruments.)	1	
4	8110002800-CAD	<b>Cleaning Powder</b>  Polishing compound for interface cones and ion lenses.	1	
5	390789701-CAD	<b>OptiPlex 960 MiniTower Computer Base: Intel® Core 2 Duo, 3.0 GHz, 6MB L2 cache, 13</b>  OptiPlex 960 MiniTower Computer Base: Intel® Core 2 Duo E8400, 3.0 GHz, 6MB L2 cache, 1333MHz FSB Memory: 4GB DDR2 Non-ECC SDRAM, 667MHz Video: Video card in PCIe bus with 1 DVI (digital) 1920x1200 max. output Sound: Integrated sound card and chassis mounted speaker Network: Integrated Intel NIC (10/100/1000 Ethernet (Intel WG82567LM LOM)) Hard Drive: SATA 320GB, 3.0GB/s, 7200 RPM with 8 MB buffer (NTFS format) Removable Media Storage Device: 16X DVD+/-RW SATA Drive with Roxio Creator (Dell edition) Floppy Drive: 1.44MB 3.5 Inch Floppy Drive Card Slots: 4 PCI full height slots (2 standard PCI, 1 PCIe x16 graphics, 1 PCIe x1) Ports: 1 VGA; 1 serial port; 2 PS2; RJ-45 network port; 10 USB 2.0 ports (4 in front, 6 in rear) Keyboard & Mouse: Dell USB enhanced multimedia keyboard & USB premium optical 5-button scroll mouse Operating System: Microsoft® Windows® 7 Hardware Support Services: 3 Year Limited Warranty (Next Business Day On-Site Service) Resource CD: Resources CD contains Diagnostics and Driver for Dell OptiPlex Systems NOTE: Minitower dimensions: H:16.10 in. x W:7.32 in.; D:16.97 in. RoHS Compliant Lead Free Chassis and Motherboard. Monitor or printer NOT included. (This PC model starting shipping on about Feb. 2009).	1	
6	392608209-CAD	<b>Dell 24-inch LCD MONITOR, 1920 X 1200; WITHOUT DVI REQ: DVI output for optimum display performance.</b>  24-Inch Flat Panel LCD Monitor with Height Adjustable Stand, Dell 2408WFP without DVI Video Card 1920 x 1200 resolution; 0.270 mm dot pitch; 6 ms typical response time; 3000:1 contrast ratio; 400 cd/m <sup>2</sup> brightness; 15-pin D-sub analog and DVI-D (digital) inputs, USB 2.0 Hi-Speed Hub with 1 USB upstream port, 4 USB downstream ports, and 9-in-2 media card reader. REQUIRES: 1 DVI (digital) video output for optimum display performance. The DVI output is included in the currently shipping Dell Optiplex 960 and 755 PC.	1	
7	190020400-CAD	<b>HP DeskJet Color Printer 120V (With Cable)</b>  H.P. DeskJet USB printer color. Includes cable. 19 PPM B/W and 14 PPM Color	1	



Quote No.: QUO-03747-X5H9VS.0

Item	Part No.	Description	Amount	Sum Price USD
8	0010082200-CAD	<p><b>SPS 3 Autosampler</b></p> <p>High throughput autosampler with fast X, Z, theta arm movement. SPS3 has capacity for up to 3 sample racks and 1 standard rack. Racks may be exchanged during analysis for unlimited sample capacity. SPS3 is supplied complete with two standard racks suitable for use with either 11 x 16 mm O.D. test tubes or 6 x 29 mm O.D. centrifuge tubes and three 60 position sample racks suitable for use with 16 mm O.D. test tubes. Any sample rack can also be used for standards. Includes built-in peristaltic pump with variable speed control for flow through rinsing of the probe. Compatible with on-line diluter (extra purchase option) for pre-mixing of samples prior to sampling, or on-line overrange sample dilution. Optional software for off-line sample dilution and preparation of multi-element standards and reagent addition is available. SPS3 is also compatible with an optional environmental enclosure preventing contamination of samples from airborne contaminants and/or removing any corrosive or toxic fumes during sampling. SPS3 uses RS232 communications to controlling PC. An RS232 interconnecting cable is supplied.</p>	1	
9	0190010700-CAD	<p><b>Cart for SPS 3</b></p> <p>Cart for SPS sampler, with lockable wheels and 2 shelves for storage.</p>	1	

**RECOMMENDED OPERATING SUPPLIES**

10	0190067700-CAD	<p><b>Recommended Operating Supplies</b></p> <p>Recommended Operating Supplies for the Bruker 820-MS. This listing should be used as a general guideline, as usage levels can obviously vary with different application demands. A simple and cost effective way to keep your supplies at reasonable levels is to order the operating supplies kit once a year. This kit has been constructed to help you have supplies on hand to keep your Bruker 820-MS running smoothly. Kit includes: 2 ea 9910121400 CRI Nickel Sampler Cone Kit 2 ea 9910121200 CRI Nickel Skimmer Cone Kit 1 ea 9910129200 Sampler Cone O-ring Kit 1 ea 9910129300 Skimmer Cone O-ring Kit 2 ea 2010100700 ICP-MS Glass Torch 1 ea 2010102100 ICP-MS Micromist Low Flow Nebulizer 2 ea 6910001200 ICP-MS Nebulizer O-ring 2 ea 6910044000 ICP-MS Spraychamber O-ring 8 pkg/12 3710027200 PVC Peristaltic Pump Tubing, Black/Black 5 pkg/12 3710034600 PVC Peristaltic Pump Tubing, Blue/Blue 1 ea 8110003000 Pump Oil, Permavis 10 1 ea 0190024400 ICP-MS Tuning Solution</p>	1	
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Quote No.: QUO-03747-X5H9VS.0



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Your Price: 123,600.00

### ONE YEAR EXTENDED WARRANTY

ICPMS111SY

ICPMS One Year Extended Warranty

This Complete Support will provide a complete inspection of listed instrumentation and all Parts, Labor, Travel, Emergency Visits and ONE Preventive Maintenance (PM) visit per year within 101 miles of a Bruker service center. Parts exclusions are noted in Terms & Conditions. Additional travel charges if applicable will be listed separately.

14,000.00

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Your Price: 137,600.00

### Terms and Conditions

**Delivery:**

Approx. 6 weeks after receipt of order, FOB destination

**Terms of Payment:**

100% net 30 day upon delivery

We reserve the right to make partial deliveries and acceptance if stand-alone systems are sold as part of package sales.

With best regards,  
Bruker Daltonics Inc.



Authorized signature



## ● 810-MS and 820-MS

### Specification Sheet

#### Design Overview

The Bruker 810-MS and 820-MS systems are compact, floor-mounted inductively coupled plasma mass spectrometers (ICP-MS) with full PC control of all instrument settings and compatible accessories. They feature patented<sup>1</sup> 90 degree reflecting ion optics system for gigahertz sensitivity (1000 Mc/s/mg/L) and low background and interferences. The Bruker ICP-MS systems include a sample introduction system, solid state 27 MHz RF generator, and patented<sup>2</sup> Turner Interlaced Coils. Full PC control of plasma positioning, triple stage vacuum system, all plasma gas flows, mass analyzer, and Discrete Dynode Electron Multiplier (DDEM) detector is also included. The vacuum system is fully contained within the instrument for a small instrument footprint. Unique DDEM detector provides nine decades of dynamic range in an all-digital pulse design. Fully web-integrated ICP-MS Expert software uses Bruker's worksheet concept for ease of use and rapid operator training. The Bruker 820-MS system also features a unique and patented<sup>3</sup> Collision Reaction Interface (CRI) providing fast, flexible, interference-free analysis using simple collision and reaction gases.

#### Instrument Hardware

##### Sample Introduction - ESIA

External Sample Introduction Assembly (ESIA) with Peltier-cooled spraychamber, nebulizer, and peristaltic pump mounted outside the torch box to eliminate temperature-induced drift. Features rapid start-up, easy access for maintenance and cleaning, and rapid switchover to accessories.

- Low-flow (400 µL/min) glass concentric nebulizer. Optional inert PFA nebulizer and a range of low-flow, inert microconcentric nebulizers
- Peltier-cooled spraychamber with variable temperature control for enhanced stability and reduced oxide ion interferences. PC-controlled temperature from -15 °C to room temperature, insulated with inert polypropylene foam
- Fully PC-controlled peristaltic pump, variable speed from 0–50 rpm, three independently pressure adjustable channels for sample, drain, and internal standards or diluent
- Standard one-piece, low flow, ball-and-socket connection torch. Optional semi-demountable torch and inert PFA transfer tubes available

##### Gas control

- One button automated optimization of all gas flows, including CRI gases (820-MS only).
- Standard sheath gas flow allows aerosol dilution of high matrix samples

##### RF generator

- 27.12 MHz solid-state, air-cooled, crystal locked RF generator in main instrument housing, 600–1600 W in 10 W increments. Optimum power settings defined and stored within each method for different sample types
- Automatic ignition and shutdown. User-customizable ignition sequence for different accessories and plasma types

##### Plasma

- Optimize plasma parameters according to specified performance targets (sensitivity, interferences, etc.)
- Full PC control of horizontal, vertical and sampling depth (Z position) of plasma for maximum sensitivity and minimum polyatomic interferences
- Spacious plasma compartment simplifies routine maintenance

##### Cool plasma

- Patented Turner Interlaced Coils minimize polyatomic interferences without the use of a mechanical torch shield



#### Instrument Hardware continued

##### Collision Reaction Interface

- Standard on 820-MS, optional upgrade for 810-MS
- Reduces interferences by injecting simple collision and reaction gases (hydrogen or helium) into the plasma as it passes through the orifice of the cones
- Gas may be injected through the sampler cone, skimmer cone, or both
- All CRI gas flows controlled by mass flow controllers
- Rapid switchover between gas on and gas off, or between different collision and reaction gases

##### Plasma interface

- Easy access and removal of sampler and skimmer cone from simple threaded mounts
- One set of C-series high performance Ni cones provided as standard (810-MS) Platinum tipped C-series high performance cones optional. One CRI skimmer cone and one purgeable sampler cone provided as standard (820-MS only). CRI sampler cone and platinum tipped CRI cones optional
- Orifice diameters: 1.1 mm sampler, 0.5 mm skimmer
- Water-cooled plasma interface for stability including individual and independent cooling of the cones for faster warm-up, improved stability, and faster cool down

##### Ion optics

- Patented ion mirror reflects analyte ion beam through 90 degrees while photons and neutrals pass to the vacuum system. Ion mirror creates parabolic electrostatic field to focus the analyte ions with optimum efficiency at the quadrupole entrance aperture. Results in gigahertz sensitivity (1000 Mc/s/mg/L)
- Features easy access to extraction lens 1 and 2 for cleaning without breaking the vacuum
- Auto-optimization of all ion optics settings, including ion mirror, based on selected optimization criteria such as signal and interferences
- Quadrupole mass analyzer is off-axis using patented<sup>4</sup> curved stainless steel entrance rods to ensure low background by further eliminating excited neutrals before the quadrupole

##### Vacuum system

- Pumps consist of two rotary (SD602 and SD302) and two V-301 turbomolecular pumps for efficient pumping and to eliminate excessive pump wear
- Rotary pumps mounted on forward facing pull-out slides for easy inspection of oil levels and easy access and changing of oil
- All vacuum components located in the main housing of the instrument to reduce noise in the laboratory and eliminate the requirement for extra floor or bench space
- Turbomolecular pumps feature maintenance-free ceramic bearings. First turbopump is positioned immediately behind the ion mirror and skimmer cone for maximum pumping efficiency and removal of unwanted neutrals and particles
- Pneumatic vacuum isolation gate between the first and second vacuum stages. Gate automatically closes in the event of a power failure



#### Quadrupole

- Precision-machined, stainless steel, round rods manufactured to micrometer tolerances and locked into ceramic mounts for a near-perfect hyperbolic field. Stainless steel construction permits determination of Hg without high memory. Patented curved entrance rods provide a double off-axis design and low background signals
- Easy access to mass analyzer and detector for cleaning or detector replacement. All voltages are fully interlocked and under PC control
- Solid-state air-cooled power supply
- Built-in, on board multi-channel scaler provides up to 40 channels per mass
- Range of 3 to 256 amu with 'zero blast' protection. Resolution adjustable from 0.5 to 1.2 amu
- Mass calibration stability: 0.05 amu per day
- Quadrupole RF frequency: 3.0 MHz
- Scan speed: 2000 amu/s
- Quadrupole settling time: <400  $\mu$ s
- Minimum dwell time: 200  $\mu$ s

#### Detector

- All-digital ETP AF250 Discrete Dynode Electron Multiplier (DDEM) as standard provides nine decades of linear dynamic range in an all-pulse-counting detector. No complex, time-consuming analog-to-digital cross calibrations
- Measuring dynodes mounted off-axis for reduced background

#### Performance

The performance data is typical unless otherwise noted.

Sensitivity (810/820 -MS, hot plasma high sensitivity mode, Mc/s/mg/L)	<sup>9</sup> Be	>50
	<sup>115</sup> In	>1000
	<sup>232</sup> Th	>300
Precision (10 replicates, 20 minutes)		<3%
Oxide ions	CeO <sup>+</sup> /Ce <sup>+</sup>	<3%
Doubly charged ions	Ba <sup>++</sup> /Ba <sup>+</sup>	<3%
Background at 5 amu		<10
Sensitivity (810/820-MS, hot plasma normal sensitivity mode, Mc/s/mg/L)	<sup>9</sup> Be	>5
	<sup>115</sup> In	>50
	<sup>232</sup> Th	>20
Precision (10 replicates, 20 minutes)		<3%
Long term stability (10 $\mu$ g/L multi-element standard aspirated for 4 hours)		<4%
Oxides	CeO <sup>+</sup> /Ce <sup>+</sup>	<1% (<2% for CRI)
Doubly charged ions	Ba <sup>++</sup> /Ba <sup>+</sup>	<3%
Background (at 5 amu)		<5 c/s
Abundance sensitivity	10 <sup>-6</sup> low, 10 <sup>-7</sup> high on <sup>23</sup> Na	
Isotope ratio precision	<0.1% ( <sup>107</sup> Ag/ <sup>109</sup> Ag)	
CRI interference reduction	1 $\mu$ g/L As readback in 1% HCl 1 $\mu$ g/L $\pm$ 0.1 $\mu$ g/L	





Typical detection limits, hot plasma (ng/L). \* CRI mode.

<sup>7</sup> Li <1	<sup>51</sup> V <0.2*	<sup>68</sup> Zn <1	<sup>101</sup> Ru <0.4	<sup>139</sup> La <0.4	<sup>175</sup> Lu <0.05	<sup>209</sup> Bi <0.3
<sup>9</sup> Be <0.5*	<sup>52</sup> Cr <0.6*	<sup>71</sup> Ga <0.2	<sup>107</sup> Ag <0.6	<sup>140</sup> Ce <0.5	<sup>180</sup> Pd <0.4	<sup>232</sup> Th <0.05
<sup>24</sup> Mg <0.5*	<sup>55</sup> Mn <0.4*	<sup>75</sup> As <0.6*	<sup>111</sup> Cd <0.2	<sup>153</sup> Eu <0.2	<sup>195</sup> Pt <0.3	<sup>238</sup> U <0.06
<sup>27</sup> Al <0.8*	<sup>58</sup> Fe <2*	<sup>78</sup> Se <2*	<sup>115</sup> In <0.1	<sup>157</sup> Gd <0.3	<sup>197</sup> Au <0.4	
<sup>40</sup> Ca <3*	<sup>59</sup> Co <0.2	<sup>89</sup> Y <0.2	<sup>121</sup> Sb <0.1	<sup>159</sup> Tb <0.09	<sup>202</sup> Hg <1	
<sup>45</sup> Sc <0.8	<sup>60</sup> Ni <2	<sup>90</sup> Zr <0.4	<sup>130</sup> Rh <0.1	<sup>163</sup> Dy <0.2	<sup>205</sup> Tl <1	
<sup>47</sup> Ti <3	<sup>65</sup> Cu <2	<sup>98</sup> Mo <0.4	<sup>138</sup> Ba <0.2	<sup>165</sup> Ho <0.06	<sup>208-206</sup> Pb <0.3	

#### Instrument Software

Easy-to-use, web-integrated design. Features wizards that guide users through method and sequence development, and method templates for rapid development of commonly used methods.

##### Features include

- Quantitate analytes on any possible combination of isotopes
- Fully editable interference correction equations
- A range of internal standard assignment options
- Multiple condition sets allowing different element suites to be determined under different conditions with a single sample measurement, including CRI modes, hot plasma, cool plasma, etc.
- Calibration routines for multi-element external calibration, method of standard additions, and isotope ratios
- Automatic method optimization
- Automatic monitoring and adjustment of nominated elements/isotopes in real time for optimal rinse out
- High speed Time Resolved Signal (TRS) capability for interfacing to chromatographic (such as HPLC) and other separation techniques
- Seamless LC-ICP-MS integration using Galaxie™ chromatographic software
- Fully editable sample label list of up to 1000 samples for analysis per worksheet
- Autosampler rack and tube positions can be edited for true random access sampling
- Calibrations can be programmed at a user specified rate either amongst the sample tubes or from centralized calibration tubes (rate driven)
- Sequence options include full control of reporting actions at the end of the run, exporting of results at the end of the run, emailing of results, calibration, recalibration and resloping error actions, and saving mass scans during the analysis
- Fully automated instrument initialization (start-up) routine, including instrument stabilization time, plasma X/Y position adjustment, mass calibration, and quadrupole resolution
- Simultaneous real-time graphical display of signal as full mass scan, segments of mass scan, and signal response vs time for multiple isotopes or ratios
- Post-run retrospective data editing
- Wide variety of reporting and exporting options
- Comprehensive set of instrument diagnostics and performance tests
- Comprehensive help system



#### Accessories

##### Autosamplers

- SPS3 high-throughput autosampler, with fast X, Z, theta arm movement
- Capacity for up to three sample racks and two standard racks. Racks may be exchanged during analysis
- Fully compatible with optional online diluter
- Compatible with a wide range of commercially available, autoclavable, laboratory racks

##### Diluter

- Optional precision syringe auto-diluter for SPS3, performs automatic online over-range dilution

##### Automatic online dilution

- Online dilution is selectable on a per-isotope basis
- Serial dilution of samples until user selected analytes are in range
- Choose to dilute with blank or from separate diluent vessel. Dilute on internal standard error option and automatic correction of internal standard factors to account for dilution

#### Accessories continued

##### Productivity Pack

- Optional four-port Switching Valve System (SVS) immediately rinses the sample introduction system while the next sample is being introduced to the instrument
- Reduces carryover, increases sample throughput, and decreases cost per analysis

##### Integrated speciation (LC-ICP-MS)

- Seamless LC-ICP-MS integration using Galaxie™ chromatographic software
- Real-time display of time resolved chromatographic signals
- Full control of LC injections, pumps, autosamplers and 810/820-MS data acquisition

##### Clean Room Pack

- Includes o-ring free, inert sample introduction system, platinum-tipped cones, and additional exhaust outlet panel
- Removes all exhaust air from the instrument, maintaining the integrity of the highly sensitive clean room environment
- Allows analysis of aggressive samples and acids, such as hydrofluoric acid

##### Vapor generation

- Modular continuous flow vapor generator for the determination of Hg, As, Se, Sb, Te, Bi, and Sn at ng/L and pg/L levels
- Compatible with SPS3 autosampler

##### AGM-1

- Adds oxygen to the plasma to eliminate carbon deposition on the injector tube and sampler cone when analyzing organic solvents.

##### Microconcentric nebulizer

- Compatible with a range of microconcentric nebulizers for sample volume limited applications



#### Laser ablation

- Fully compatible with a range of laser ablation accessories

#### ICP-MS Installation Requirements

For details of Bruker ICP-MS installation requirements refer to the pre-installation manual, Bruker publication number 8510206700.

#### Bruker Customer Support Policies

##### Warranty

12 months, though this may vary by location. One-year warranty on DDEM detector with pro-rata warranty on replacements.

##### Hardware support period

Five (5) years from date of last unit manufacture. After this time, parts and supplies will be provided if available.

##### Software support

Software upgrades to fix nonconformances or safety issues will be issued free of charge. Software upgrades for additional functionality will require a fee. Availability of remote diagnostic support may vary according to location.



#### Further Details

For further details on the following

- PC configurations
- Installation/Operational Qualification
- Accessory specifications and application information
- Part numbers and other ordering information
- Bruker ICP-MS spectrometers are manufactured according to a quality system certified to ISO-9001. Please consult your Bruker office or supplier, or our Web site at [www.bruker.com](http://www.bruker.com).

For research use only. Not for use in diagnostic procedures.

[1] US Patent 6,614,021 B1

[2] US Patent 5,194,731

[3] US Patent 7,329,863 B2

[4] US Patent 6,762,407 B2

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[www.bruker.com/chemicalanalysis](http://www.bruker.com/chemicalanalysis)

**Bruker Daltonik GmbH**  
Bremen - Germany  
Phone +49 (0)421-2205-0  
Fax +49 (0)421-2205-103  
sales@bdai.de

**Bruker Daltonics Inc.**  
Billerica, MA - USA  
Phone +1 (978) 663-3660  
Fax +1 (978) 667-5993  
ms-sales@bdai.com



Chemical Analysis



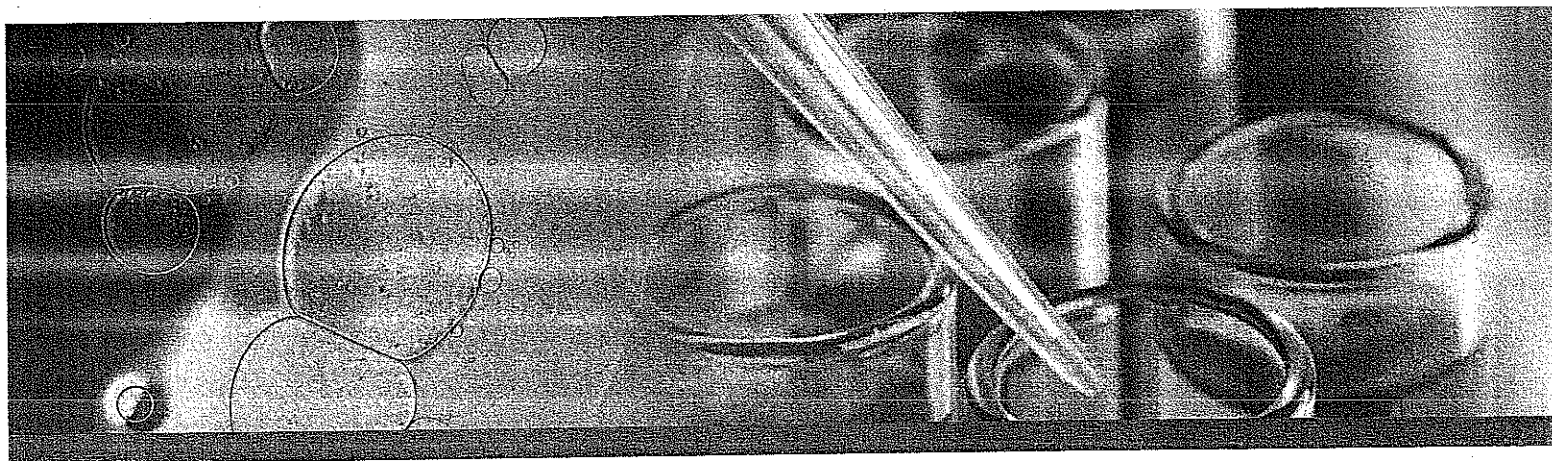
## 810/820 MS

● ICP Mass Spectrometers

think forward

Mass Spectrometry

## Your Partner in ICP-MS Solutions



Bruker continues to find new and novel ways to meet your changing needs. As a leader in elemental analysis you can be assured that when you buy a Bruker ICP-MS, you're buying more than just an instrument. You're buying a relationship with one of the most respected and experienced instrument companies in the world.

## ● ICP-MS: It's never been Easier

### Choosing an ICP-MS has never been easier

If you've ever wished that ICP-MS could be simpler, wish no more. The Bruker 810-MS and 820-MS make ICP-MS effortless. No matter what your requirements, with a Bruker ICP-MS, you can tackle any application with ease.

Ease-of-use features of the Bruker 810-MS and 820-MS include:

- Fast switch-over. Bruker's patented collision/reaction interface (CRI) system makes setup of complex reaction cell conditions a thing of the past. Simply turn on the gas flow to remove interferences. It's that simple. (820-MS only)
- Auto-optimization. Take the guesswork out of ICP-MS. With auto-tuning of all instrument parameters, you can spend less time on instrument setup and more time on sample analysis.
- Great software. The ICP-MS Expert software provides one-step optimization and method development. And it makes standard preparation easy; it can instruct you on what solutions to make and how to make them.

### With two ICP-MS models, the choice is yours

Core to both the 820-MS and 810-MS, Bruker's patented high-efficiency 90 degree ion optics and double off-axis quadrupoles deliver exceptionally low background noise and unmatched sensitivity – at more than 1 million counts per second for 1µg/L.

The 820-MS features Bruker's novel collision reaction interface (CRI) system, which provides simple, routine removal of troublesome spectroscopic interferences. The result is faster, more flexible interference-free analysis without the worry of complex multipole or scanning quadrupole ion guides, or cells. And, by coupling auto-tuning of all instrument parameters, including CRI gases, instrument productivity is greatly enhanced.

For samples that don't require CRI, the 810-MS is an ideal instrument with industry leading sensitivity for trace and major elemental analysis.





# The Benchmark for Analytical Performance

When you require ease-of-use and the ultimate in analytical performance, the 810-MS and 820-MS deliver.

- Unique and patented collisional interface/extraction optics minimize interferences, providing reliable, routine, trace level quantification.
- Optimized sample introduction system, including computer-controlled Peltier-cooled spraychamber, reduces interferences and improves stability.
- Robust, high-efficiency plasma system and patented Turner Interlaced Coils break down the toughest sample matrices, reduce matrix effects, and minimize ion energy spread for maximum sensitivity and stability.
- Patented 90 degree ion mirror and low noise double off-axis quadrupole provide industry leading sensitivity and background.
- All-digital extended range detector – more than nine decades of dynamic range in pulse counting (digital) mode. Ease-of-use, fewer dilutions, and a guaranteed one year detector lifetime mean greater productivity and lower running costs for your laboratory.
- Bruker's ICP-MS series takes your laboratory to the leading edge of laser ablation performance (LA-ICP-MS), providing a solution for the direct analysis of challenging solid samples.
- A range of accessories to further expand the productivity and capabilities of the new ICP-MS series are available. Options like the Clean Room Pack, Productivity Pack and SPS3 autosampler, provide solutions for your most demanding applications.

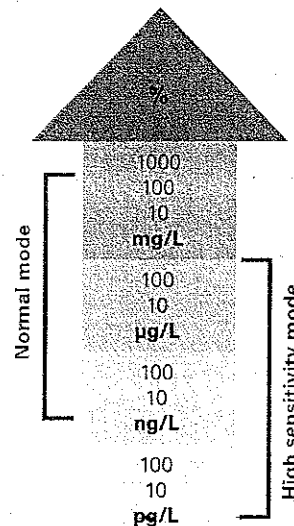
- Fully integrated LC-ICP-MS using Galaxie chromatography software and ICP-MS Expert software, making elemental and molecular speciation easy.

Feature	810-MS	820-MS
Collisional interface	•	•
Optimized sample introduction	•	•
Interlaced coils	•	•
90 degree ion mirror	•	•
All-digital detector	•	•
LA-ICP-MS	•	•
LC-ICP-MS	•	•
Collision/reaction interface (CRI)	○	•
Clean Room Pack	○	○
Productivity Pack	○	○

• Standard feature ○ Optional feature

Isotope/Species	Typical Hot Plasma Performance
<sup>9</sup> Be	> 50 million cps/mg/L
<sup>115</sup> In	> 1000 million cps/mg/L
<sup>232</sup> Th	> 500 million cps/mg/L
CeO <sup>+</sup> /Ce <sup>+</sup>	< 3%

Industry leading sensitivity, patented Turner Interlaced Coils, and 27 MHz plasma combine to deliver the remarkable performance of the Bruker ICP-MS.



In high sensitivity mode, oxides such as CeO remain at <3% and can be further reduced under normal mode conditions to <1%.

# Fast, Flexible, Interference-Free Analysis

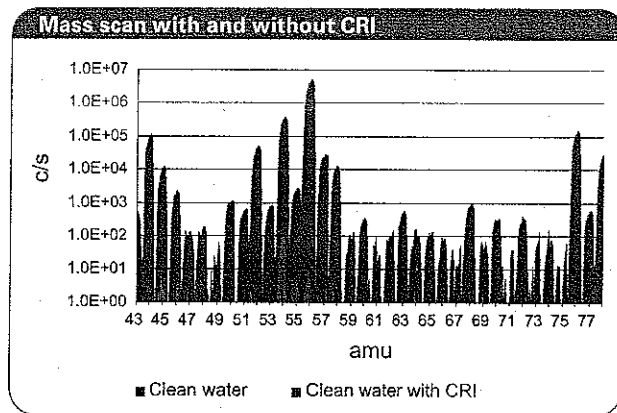
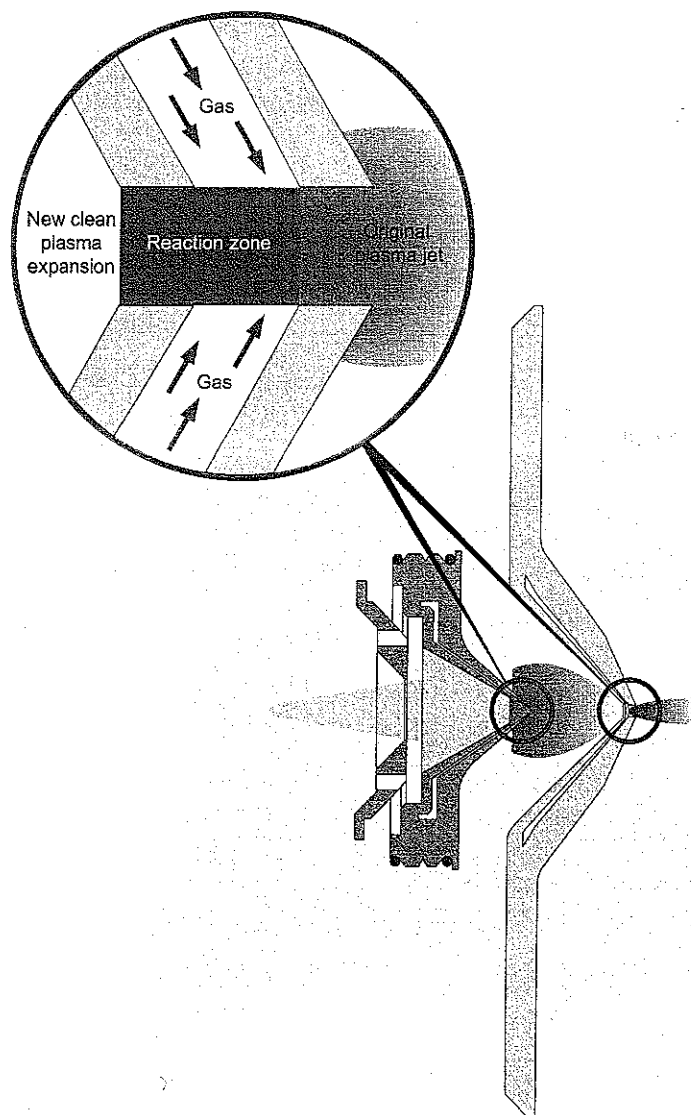
Determine the toughest analytes in any sample without interferences

## How does CRI work?

The collision/reaction interface (CRI) injects helium (He) and hydrogen (H<sub>2</sub>) collision and reaction gases directly into the plasma as it passes through the orifice of the cones.

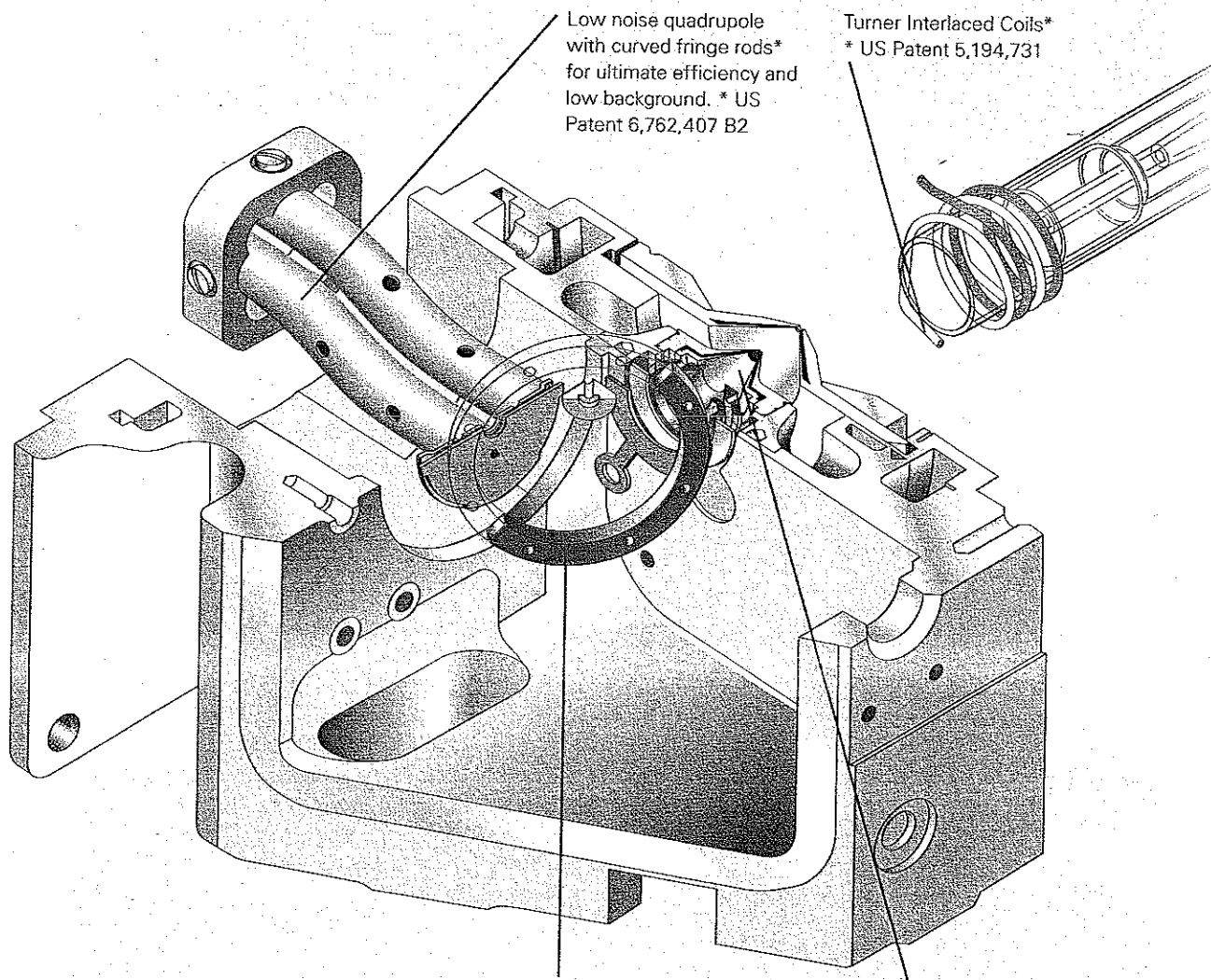
This innovative approach suppresses interferences before the analytes are extracted into the ion optics. It's that simple!

- No need for corrosive or expensive gasses, such as ammonia and methane.
- Setup and analysis are fast and easy as there are no complex multipole ion guides.
- The CRI reaction is not confined to a cell, so you can quickly switch from CRI to non-CRI mode, or between different collision and reaction gases.



Dramatically reduce or eliminate troublesome plasma and sample matrix based interferences, using CRI.

● Our 90 Degree Reflecting Ion Optics Revolutionizes ICP-MS Performance



Low noise quadrupole with curved fringe rods\* for ultimate efficiency and low background. \* US Patent 6,762,407 B2

Turner Interlaced Coils\*  
\* US Patent 5,194,731

The ion mirror\* reflects the ion beam through 90 degrees, focusing the analyte ions into the quadrupole with the highest possible efficiency.

By keeping photons and neutrals away from the mass analyzer, the ion mirror greatly reduces background signal.  
\*US Patent 6,614,021 B2

820-MS collision/reaction interface\* (CRI) provides fast, flexible, interference-free analysis.

\*US Patent 7,329,863 B2

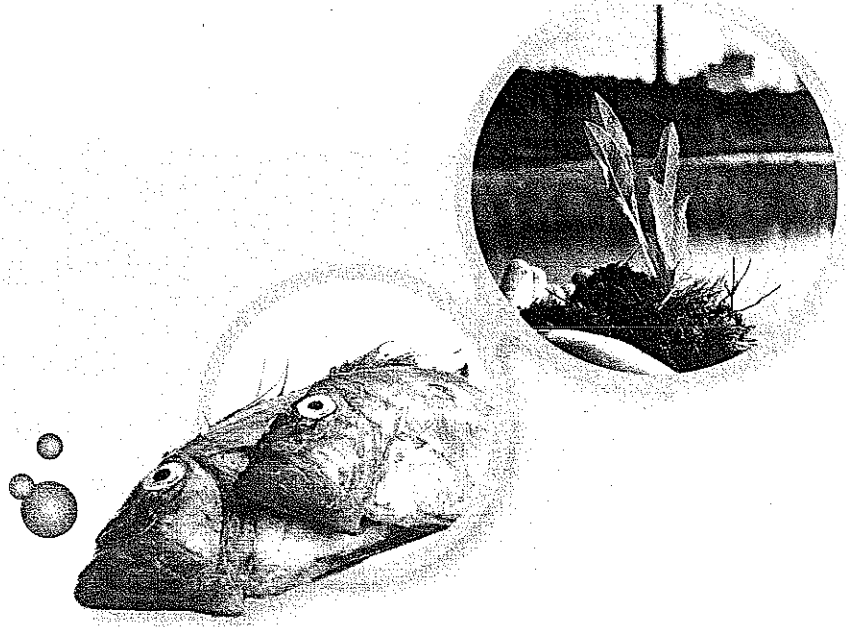
● Innovation You Can Trust

**Determination of As in Cl containing samples**

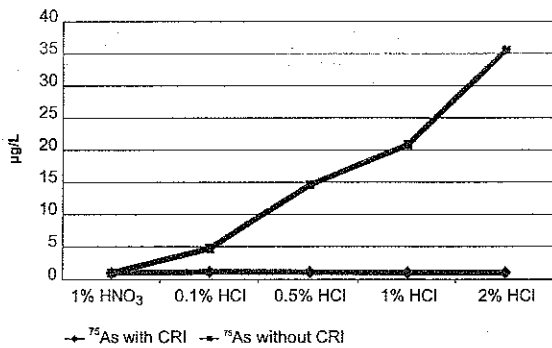
Use CRI in H<sub>2</sub> mode to remove the ArCl interference when determining As in samples ranging from drinking water to seafood to soil.

**Quickly and reproducibly reduce interferences**

With CRI you can quickly switch from CRI to non-CRI, or between different collision and reaction gases.

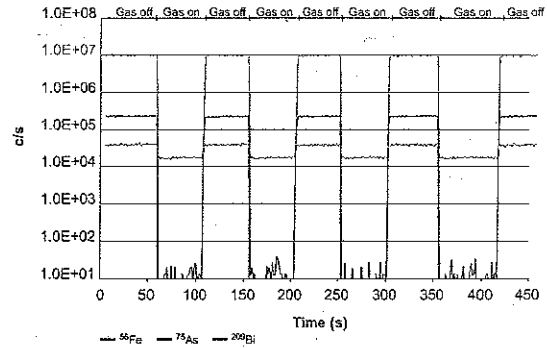


1 µg/L As in HCl matrix



Comparison plots showing 1 µg/L spike recoveries for <sup>75</sup>As without correction equations. ArCl interferences are removed, allowing accurate trace level quantification of As.

Time scan with and without CRI - 1% HCl



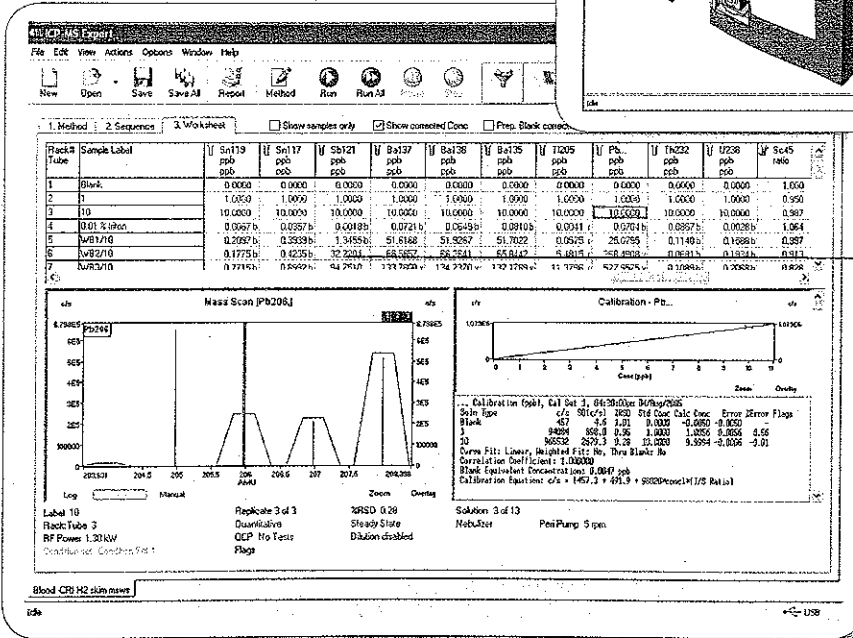
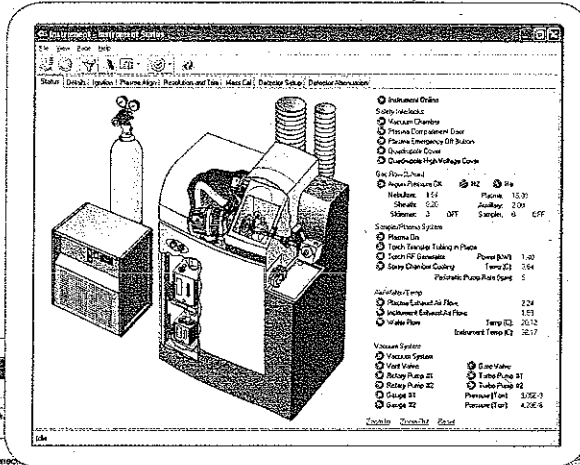
With CRI, <sup>40</sup>Ar<sup>16</sup>O and <sup>40</sup>Ar<sup>35</sup>Cl interferences on <sup>56</sup>Fe and <sup>75</sup>As respectively are reduced by over six orders of magnitude with minimal effect on the <sup>209</sup>Bi spike sensitivity.

# ● Setting the Benchmark for Ease-Of-Use

## ICP-MS Expert software

Bruker redefines ease-of-use with our Web-integrated ICP-MS worksheet software. ICP-MS Expert features a range of automated options, including setup and initialization routines, such as plasma alignment, mass calibration and resolution tests. Bruker's AutoMax makes method development easy by automating all ion optics, nebulizer and plasma settings for optimum results.

The dynamic Instrument Status window provides a quick visual check of the status of all system components. It is an excellent diagnostic tool that maximizes instrument up time.

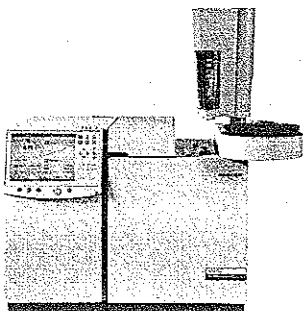


Each worksheet cell provides all the results you need – including concentrations, intensities, statistics, replicate readings and graphical mass scans.

ICP-MS Expert switches automatically between multiple method condition sets within a single sample, giving optimum performance for specific element suites, without having to re-run samples.

# Chemical Analysis Solutions

## Laboratory gas chromatography systems



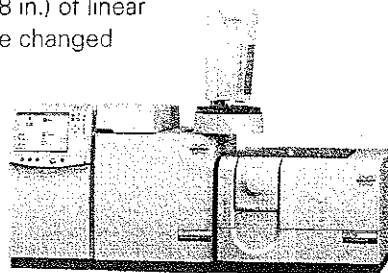
The 400 Series consists of two gas chromatographs and an associated range of analyzers and solutions designed for leading applications. These systems allow chemists and engineers to employ standard methods and/or high quality trace sample analysis, in the petrochemical, agrochemical and environmental industries.

The 450-GC is a highly affordable and powerful analytical instrument that offers robust operation in an easy-to-use package. The system gives users a broad choice of injectors, detectors, switching and sampling valves up to three channels. The high resolution color touch screen is intuitive and supports local languages. The Varian 430-GC offers the same outstanding performance as the 450-GC but in a compact, single channel package that occupies about half the bench space of conventional multi-channel GC.

## Triple quadrupole mass spectrometer

The Bruker 320-MS GC/MS stands at the forefront of configurable triple-quadrupole mass spectrometer systems. It offers: femtogram sensitivity, 10 – 2000 Da mass range, and a wide array of chromatographic and ionization configurations to uniquely match your needs - all in less than 72 cm. (28 in.) of linear bench space! In minutes, the 320-MS can be changed from EI to CI modes of operation. Easily, the 320-MS is the most sensitive, robust, and flexible triple-quadrupole MS system currently available.

For research use only.  
Not for use in diagnostic procedures.



● **Bruker Daltonik GmbH**

Bremen · Germany  
Phone +49 (421) 2205-0  
Fax +49 (421) 2205-103  
sales@bdal.de

**Bruker Daltonics Inc.**

Billerica, MA · USA  
Phone +1 (978) 663-3660  
Fax +1 (978) 667-5993  
ms-sales@bdal.com

RFQ No. DEP15345

STATE OF WEST VIRGINIA  
Purchasing Division

**PURCHASING AFFIDAVIT**

**West Virginia Code §5A-3-10a states:** No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

**DEFINITIONS:**

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

**EXCEPTION:** The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

**WITNESS THE FOLLOWING SIGNATURE**

Vendor's Name: BRUKER DALTONICS / GEORGE MANNING

Authorized Signature: [Signature] Date: 3/22/11

State of Virginia

County of Loudoun, to-wit:

Taken, subscribed, and sworn to before me this 22 day of March, 2011.

My Commission expires 11/30/2011, 20    .

AFFIX SEAL HERE

NOTARY PUBLIC [Signature]

