Agilent ICP-MS Journal

June 2007 – Issue 31

NEW!
Agilent 7500cx ICP-MS
see inside for details!

Inside this Issue

Agilent Technologies

Determination of Aluminum and Zinc Levels in Plasma

Judy Brown, LinaCel Cadden,
Satellite Laboratory Services, LLC, CA, USA
caddenl@satellitelabs.com

Introduction

Satellite Laboratory Services, LLC, is a leading provider of renal laboratory services. An important test conducted by the lab is the determination of aluminum and zinc in end-stage renal disease (ESRD) patient plasma samples using ICP-MS.

Instrumentation

Prior to 2003 the laboratory assayed aluminum in plasma using Graphite Furnace Atomic Absorption (GFAA). In response to an increasing number of samples, a Perkin Elmer Elan 9000 was purchased in late 2003. The Elan 9000 underwent validation studies for aluminum (1:20 dilution) and zinc (1:50 dilution) in patient plasma. Trace metal analysis in dialysis water was later added in 2004. Switching the ICP-MS between plasma and water methods proved to be cumbersome and challenging. It required a time-consuming cleaning and maintenance procedure as well as methanol correction procedure to correct for differences in matrices. By late 2005, the sample load had increased sufficiently to warrant a second ICP-MS for running only plasma samples. Several vendors participated in the evaluation process, and Agilent was chosen based on their ability to meet a clinical laboratory's unique needs and their ability to simultaneously assay plasma aluminum and zinc from a single 1:20 dilution in less time.

The first Agilent 7500 ICP-MS was installed in the laboratory in late 2005 with a second instrument added in late 2006. Central to the ability of these instruments to handle the laboratory's ever-increasing sample load are:

- Minimal maintenance and start up procedure
- Stability of calibration curve and consistent internal standard recoveries
- Ease of operation
- Reduced sample preparation requirements with a single 1:20 dilution
- Simultaneous analysis of both aluminum and zinc
- Elimination of the methanol correction procedure
- Pre-emptive Rinse function
- CETAC ASX-520 autosampler with 270 sample capacity

Procedure

Satellite Laboratory Services provides dialysis units with sample collection tubes that have been lot tested to confirm the absence of aluminum and zinc. Any samples received in tubes other than these are rejected. Samples exhibiting gross hemolysis are also rejected.

High purity reagents are used: Optima Grade of 70% nitric acid and DI and distilled water that meets CAP Type I specifications. Liquid argon is 99.996% pure. Made-to-order reagents include stock solutions for the preparation of aqueous calibrators, three levels of multi-element standards, 10 ppm tuning solution and a multi-level internal standard.

Analytical Protocol

Diluted calibration standards, controls and samples are loaded into an enclosed CETAC ASX-520 autosampler. To reduce analysis time, the system uses a pre-emptive rinse, and the peri-pump software program is set to increase sample uptake rate during wash cycles. With an autosampler capacity of 270 patient samples and a 2.5min./sample-to-sample analysis time, we are able to load a second set of samples onto each instrument before the end of our normal workday. Since the 7500a continues to run unattended, we program a standby sequence to shut the instrument down when the run is completed.

Results

Acceptance criteria for calibration and controls are:
a. Calibration: r^2: ≥ 0.999; BEC: ≤ 0.3 ppb; Internal standard (ISTD) has consistent/stable recovery
b. Controls must be within the established range
c. Check Controls are run at the beginning of the sample batch, after every 20 samples, and at the end of the batch. If the control is outside the established range, samples in between the last acceptable check control and the out-of-range check control must be repeated.
d. The RSD for the ISTD must be ≤ 10% or the sample must be rerun.
e. The sample's ISTD measured intensity must be ≤ 25% of the blank's ISTD measured intensity or the sample must be rerun.
f. The Check Controls' ISTD must be ≤ 10% of the blank's ISTD.

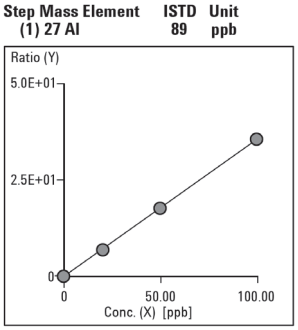


Figure 1. Typical calibration curve for aluminum

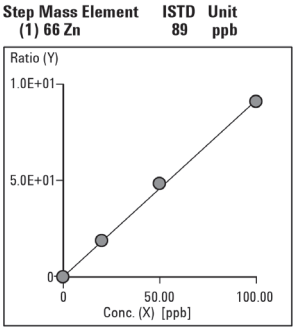


Figure 2. Typical calibration curve for zinc

The linear ranges were validated as follows:
Aluminum: 0.05 to 300 ug/L (ppb)
Zinc: 0.05 to 300 ug/L (ppb)
Results below the linear range are reported as <1 ug/L. Results with a direct reading >300 ug/L must be further diluted and re-assayed.

Conclusions

Since using the methodology described, turn around times (TAT) have improved dramatically. Historically TAT on GFAA and early-ICP-MS averaged 1 to 2 weeks. They now average 1-3 days. A third Agilent 7500a ICP-MS has been validated for running aluminum and zinc in plasma samples. It is also undergoing validation for dialysis water. Once completed, the bulk of the sample throughput will be handled by Agilent 7500a ICP-MS systems.

New P/A Tuning and Calibration Solutions Available for ICP-MS

Steve Wilbur and Tomo Yamada,
Agilent Technologies

Introduction

In order to simplify tuning, calibration and regulatory compliance of the 7500 Series ICP-MS, several new or updated solutions are now available.

P/A Tuning Solution Kit

Pulse/Analog (P/A) factor tuning should be performed regularly in order to achieve optimum linear response across the 9 orders of detector dynamic range. This is especially important after any Electron Multiplier (EM) adjustments, such as EM autotune, and when large numbers of samples are being analyzed over a wide range of concentrations. P/A tuning is an automated process whereby the instrument measures a solution containing elements covering the mass range being used and determines both the pulse and analog signal for each. In order to achieve accurate measurements in both modes, each isotope should generate a response between 100,000 and 1,000,000 cps. Since the relative isotopic abundance and degree of ionization vary from element to element, different concentrations of elements are necessary in order to fall within the required cps range. Previously, this was achieved by analyzing several different solutions at different dilutions, or by repeatedly adjusting the tune to vary the instrument sensitivity. Now, a new P/A tune solution (part # 5188-6524) has been developed, which includes elements across the mass range, at concentrations that will almost always result in a complete P/A tune with a single analysis of a single sample.

Depending on the configuration and tuning sensitivity of the instrument, a simple dilution (100x – 500x) will result in a P/A mix at the correct concentrations for all elements.

Ordering Information
Description: 7500 Series P/A tuning solution set
Part #: 5188-6524
Contents: 2 x 100 mL bottles containing:

7500 Series P/A Tuning-1
(all in a solution of 2-5% HNO_3)
- 20 ppm each of Zn, Be, Cd, As
- 10 ppm each of Ni, Pb, Mg
- 5 ppm each of Tl, Na, Al, U, Cu, Th, Ba, Co, Sr, V, Cr, Mn, Li6, Sc, In, Lu, Bi
- 2.5 ppm each of Y, Yb

7500 Series P/A Tuning-2
(all in a solution of 10% HCl and 1% HNO_3 with trace amounts of HF)
- 10 ppm each of Mo, Sb, Sn, Ge, Ru, Pd
- 5 ppm of Ti, Ir

Internal Standard Solution Mix

A new internal standard solution mix has also been prepared which is more appropriate to a wider variety of applications using collision cell or non-collision cell modes.

Ordering Information
Description: ICP-MS Internal Standard Mix Solution (100mL)
Part #: 5188-6525

Contents: (all in a solution of 10% HNO_3)
- 100ppm of Li6, Sc, Ge, Rh, In, Tb, Lu, Bi

Interference Check Solutions

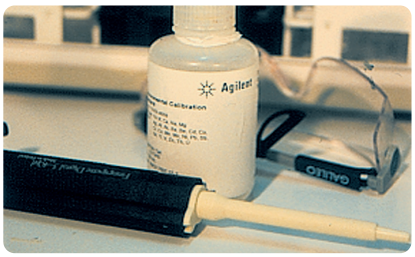
Two updated EPA 6020 compliant Interference Check Solutions (ICS-A and ICS-B) have been prepared to comply with the most recent version of EPA 6020 (6020A). These replace the old ICS-A and ICS-B mixes.

Ordering Information
Description: 6020 Interference Check Solution A (100mL)
Part #: 5188-6526

Contents: (all in a solution of 5% HNO_3 with trace amounts of HF)
- 20000 ppm of Cl
- 3000 ppm of Ca
- 2500 ppm each of Fe, Na
- 2000 ppm of C
- 1000 ppm each of Al, Mg, P, K, S
- 20 ppm each of Ti, Mo

Description: 6020 Interference Check Solution B (100mL)
Part #: 5188-6527

Contents: (all in a solution of 5% HNO_3)
- 20 ppm each of Cr, Co, Cu, Mn, Ni, V
- 10 ppm each of As, Cd, Se, Zn
- 5 ppm of Ag



Agilent - #1 Position in the Worldwide ICP-MS Market

Tuesday 19 June 2007

Company Profile: Agilent Technologies
LabTechnologist.com brings you an exclusive interview with Chris van Ingen - the president of Agilent's Life Science and Chemical Analysis (LSCA) division, *writes Matt Wilkinson.*

Chris van Ingen, president of Agilent's Life Science and Chemical Analysis (LSCA) division, had an interview recently with Matt Wilkinson of LabTechnologist.com as part of their Company Profile series. In response to a question about which Agilent product lines he considered to be 'industry leading', Mr van Ingen gave an overview of all main LSCA product lines, and with respect to ICP-MS, stated: "in ICP-MS we are the global leader, with approximately 35 per cent market share." He went on to explain Agilent's mission for all product lines:

"Our goal has been - and continues to be – to achieve number one or number two in the markets in which we participate. It provides critical mass volume and enables us to have a global presence and to invest enough to continuously evolve the portfolio."

To view the full text, go to
www.LabTechnologist.com

The New Agilent 7500cx: Performance Characteristics

Steve Wilbur
Agilent Technologies, Inc., USA

Introduction

The 7500ce has been replaced by a new model - the 7500cx - which defines a novel concept in ICP-MS: removal of matrix- and plasma-based polyatomic interferences from all elements in any matrix, under a single set of operating conditions. Only Agilent's unique collision cell technology can use helium collision mode; making the 7500cx the clear choice for easy, ppt-level quantification in the most challenging sample matrices.

Instrumentation

All work was performed using a standard Agilent 7500cx ICP-MS, fitted with a glass concentric nebulizer and standard autosampler, and operated in helium collision mode. The 7500cx can also be operated in no-gas mode, which gives improved DLs for low-mass uninterfered elements, such as Li, Be and B. In special cases where the measurement of selenium at less than 100 ppt is required, the optional hydrogen cell gas kit can be installed, which enables reaction mode using hydrogen. Hydrogen mode also offers improved LODs for some other elements, such as Si and Ca, by allowing access to their most abundant isotopes, but this is not typically required for most sample types.

Experimental

Instrument detection limits (IDLs) were determined from full scan acquisitions (from mass 6 to 238) in ultrapure water, using only helium collision mode – Table 1. In addition, a difficult sequence of high matrix environmental samples and standard reference materials was run in order to measure instrument performance in terms of accuracy, speed and stability. In total, 300 samples were analyzed in 12 hours (less than $2^1/_2$ minutes per sample) including 48 replicate analyses of NIST 1640.

Element	Certified (ppb)	Measured (ppb)	Recovery (%)
9 Be	34.94	34.48	98.7%
11 B	301.1	300.3	99.7%
23 Na	29.35 ppm	30.42 ppm	103.6%
24 Mg	5.819 ppm	5.60 ppm	96.2%
27 Al	52.0	50.97	98.0%
39 K	994	1,016	102.2%
42 Ca	7.05 ppm	7.02 ppm	99.6%
51 V	12.99	12.95	99.7%
52 Cr	38.6	37.17	96.3%
55 Mn	121.5	125.0	102.9%
56 Fe	34.3	33.88	98.8%
59 Co	20.28	20.38	100.5%
60 Ni	27.4	27.39	100.0%
63 Cu	85.2	85.88	100.8%
66 Zn	53.2	53.96	101.4%
75 As	26.67	27.20	102.0%
78 Se	21.96	22.98	104.6%
88 Sr	124.2	125.9	101.4%
95 Mo	46.75	47.56	101.7%
107 Ag	7.62	7.13	93.6%
111 Cd	22.79	22.59	99.1%
121 Sb	13.79	13.67	99.1%
137 Ba	148.0	147.3	99.5%
208 Pb	27.89	25.98	93.2%

Table 1. Results of analysis of NIST 1640 in helium collision mode

Results and Discussion

Measured Instrument Detection Limits in Helium Collision Mode

Three sigma instrument detection limits (IDLs) in parts per trillion (ppt) in ultrapure water were acquired (see ref. 1 for data). Because helium is a light, inert gas, and kinetic energy discrimination has little effect on monatomic ions, IDLs are excellent across the entire mass range. Even low mass, high ionization potential elements like Be yield single-digit ppt IDLs. Only S and Cl had IDLs higher than 1 ppb. If needed, S can be analyzed at ppt levels using the optional xenon cell gas kit.

Accuracy of Helium Collision Mode

To test the accuracy of helium collision mode, a certified reference water standard (NIST 1640) was analyzed using standard, high throughput conditions and helium collision mode for all elements – Table 1. No interference correction equations were used, since all polyatomic interferences are removed. Even elements that are normally run in no-gas mode (such as Be), and Se which is typically run in hydrogen mode, showed excellent recoveries.

Comparing the Effectiveness of Helium Collision Mode for Se, As and V in Variable Matrices

Of all the elements typically measured in environmental or other high matrix samples, only selenium benefits from the use of hydrogen mode compared to either no-gas mode or helium mode. Because Se is subject to common spectroscopic interferences on all of its 6 isotopes, it is difficult to measure in no-gas mode. While hydrogen mode is very effective at removing the Ar_2^+ polyatomic at masses 78 and 80, resulting in low ppt IDLs in most matrices, helium collision mode is also very efficient, resulting in IDLs between 35 and 150 ppt at mass 78, depending on the matrix. Helium collision mode is also effective at removing the $ArCl^+$ and $CaCl^+$ interferences at m/z = 77 even in high chloride matrices, freeing up a second Se isotope with sub ppb

BEC (ppt)				
	1/50 aquaregia		ICS-A	
Element	No-gas mode	He mode	No-gas mode	He mode
77 Se	26,700	630	10,000	400
78 Se	5,700	130	9,700	340
51 V	11,300	330	1,500	110
75 As	7,500	130	1,900	120
3s IDL (ppt)				
	1/50 aquaregia		ICS-A	
Element	No-gas mode	He mode	No-gas mode	He mode
77 Se	1,300	270	540	200
78 Se	270	150	310	160
51 V	830	91	140	45
75 As	600	84	190	150

Table 2. Results of analysis of 1/50 diluted aquaregia (0.5 vol% HNO_3 + 1.5 vol% HCl) and EPA 6020 Interference Check Solution A (ICS-A) to determine the Background Equivalent Concentration (BEC) and Instrument Detection Limit (IDL) in each matrix.

IDLs. Helium collision mode also provides superior detection limits for both As and V which suffer from chloride-based-interferences in high chloride matrices (Table 2).

Performance Advantages in Real World Samples

In order to test the expected advantages of the 7500cx, a sequence composed of typical environmental samples was analyzed for 12 hours after a single initial calibration. In all, 300 analyses were performed including replicate ICS-A samples, commercial mineral waters and replicates of NIST 1640. NIST 1640 was analyzed 48 times over the course of the sequence.

The primary advantages of using only helium collision mode, compared to multiple modes are simplicity, speed and accuracy. Tuning is reduced to a single set of standardized conditions that work well for any analyte in any matrix. No special optimizations are required and the need to generate and store tune conditions for multiple modes is eliminated. The result is reduced setup time and significantly reduced acquisition times, making the 7500cx the highest productivity ICP-MS available. An additional benefit from the use of a single mode is improved long term stability. Figure 1 is a normalized plot showing the long-term stability of NIST 1640 recoveries over the 12 hour, 300-sample sequence which also included high TDS mineral

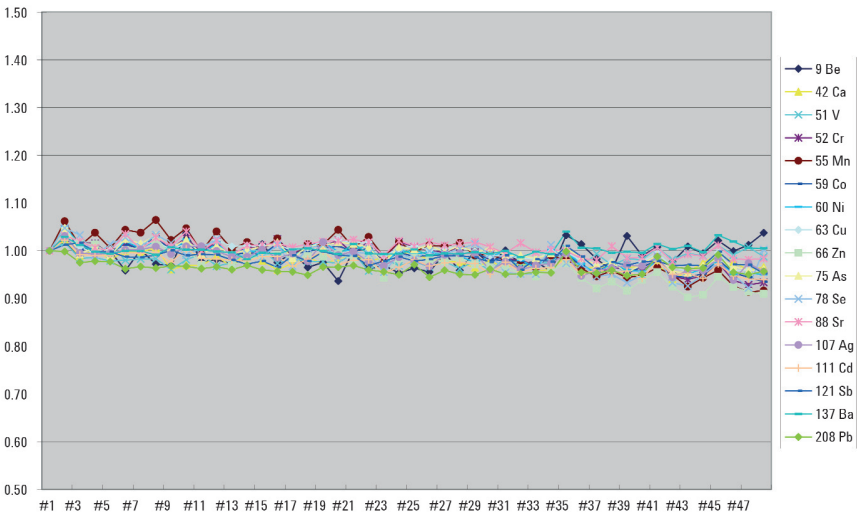


Figure 1. Normalized recovery of multiple elements in NIST 1640 (n=48) over a 12 hour 300 sample sequence in helium collision mode.

Conclusions

The Agilent 7500cx ICP-MS operating in helium collision mode has been shown to be a simple, fast and effective solution to the problems associated with polyatomic interferences in ICP-MS.

- A single, universal tune is utilized for all analytes in all matrices.
- No time is spent acquiring data such as internal standards in more than one mode and stabilization time after mode changes is completely eliminated.
- Instrument detection limits, measured in helium collision mode, across the mass range are sub ppb (mostly low ppt) for all elements except S and Cl.
- A full suite of environmental metals can be analyzed is less than 2.5 minutes per sample.

For more information, see Application note: Performance Characteristics of the Agilent 7500cx, 5989-6663EN, available from www.agilent.com/chem/icpms

Interference-Free Semiquant Analysis using the 7500cx

Steve Wilbur
Agilent Technologies, Inc., USA

Introduction

Semiquantitative elemental analysis (semiquant) by ICP-MS is a powerful tool for quick screening of unknown samples for a wide range of trace elements. It is based on the fact that the relative response of any element can be estimated from the response of any other element under a given set of conditions. These relative responses are determined by the unique properties of each element as well as the instrument and operating conditions, and can be stored in a semiquant response factor database. The use of internal standards or other calibration elements allows the database to be updated as needed to reflect the specific acquisition and matrix conditions. In practice, however, spectral interferences have limited the usefulness of semiquant for a number of elements in many common matrices.

Collision/Reaction Cell ICP-MS and Semiquant

In most CRC instruments, specific information about the matrix and target analytes is required in order to set up the correct collision/reaction chemistry to eliminate the interferences. Additionally, the conditions required to eliminate one interference in one matrix are generally not effective for all analytes in all matrices. For this reason, multiple sets of collision/reaction conditions are typically used. However, accurate Semiquant response factors cannot be determined for elements acquired under different CRC conditions. As a result, it has not previously been possible to use CRC technology to reduce interferences in Semiquant in the same way as in full quantification. However, the unique ability of Agilent's Octopole Reaction System (ORS) to eliminate polyatomic interferences using carefully controlled kinetic energy discrimination (KED) in helium collision mode permits all elements to be acquired under a single, universal set of CRC conditions.

Advantages of the use of helium collision mode with Semiquant include:

- Semiquant is simple, fast, accurate, and interference-free for all analytes in any matrix.
- Helium collision mode allows the use of HCl, H_2SO_4, or other acids in digestion without danger of chlorine- or sulfur-based interferences on elements such as As, Cr, Se, V, Zn, etc.
- Improved stability for elements like Ag, Hg, Sb, Sn, and the Pt group due to the ability to add HCl to samples and standards.
- Ability to select most abundant isotope for best sensitivity, or multiple isotopes for improved data confidence.
- Freedom to use any internal standards.

Experimental

The 7500cx ICP-MS was tuned for the same typical robust plasma conditions that are used in routine quantitative analysis (Table 1). No special tuning is required. Semiquant acquisition parameters are listed in Table 2.

A single calibration standard (containing 200 ppb of Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, K, Li, Mg, Mn, Na, Ni, Pb, Rb, Se, Sr, Th, Tl, U, V, and Zn made up in 1% HNO_3/0.5% HCl) was used to update the semiquant response factor database for a range of elements across the mass range. Non-calibrated elements are updated by interpolating between calibrated isotopes, which the ChemStation does automatically. Any number of calibration elements may be used, but increasing the number of calibration elements will improve semiquantitative accuracy. Internal standardization was applied using a typical suite of internal standard elements distributed across the mass range.

RF power	1550 W
Sample depth	8.0 mm
Carrier gas flow rate	0.90 L/min
Makeup gas flow rate	0.23 L/min
Sample flow rate	0.4 mL/min
Spray chamber temp	2 °C
Helium flow rate	5 mL/min
KED	2V

Table 1. Tune conditions used for NIST 1640 semiquant analysis in helium collision mode

Total run time	**170 seconds**
Acquisition mode	Spectrum – peak hopping
No. of masses :	250
Integration time [sec] masses 2 - 260 No. of points per mass :	0.1 sec/point 1
Acquisition time :	50.9 sec
Number of replicates :	1
Uptake time :	20 sec
Stabilization time :	60 sec
Post acquisition rinse :	30 sec
Preemptive rinse :	On (time = 30 sec)

Table 2. Semiquant acquisition parameters for NIST 1640

Results and Discussion

Tables 3 and 4 show the results of a semiquantitative screen of three standard reference materials, NIST 1640 water, LGC 6010 hard drinking water, and LGC 6177 landfill leachate. No attempt was made to matrix-match; tune conditions used were as shown in Table 1; and all elements were acquired in helium collision mode. In all cases, for every certified element, the semiquant result was within ± 30% of the certified concentration, from as low as 7 ppb for Ag in NIST 1640 to over 1700 ppm for Na in the LGC 6177 landfill leachate.

Conclusions

Semiquant has always been a powerful tool available to the ICP-MS analyst for quickly estimating the concentration of unknown, uncalibrated elements in a variety of simple matrices. However, in complex matrices, polyatomic interferences could render the results for many elements useless. Collision/reaction cell technology, which requires more than one set of conditions for all masses, cannot be used since it would result in deviation from the standard relative response tables upon which semiquant is based. Helium collision mode coupled with kinetic energy discrimination in the Agilent 7500cx can overcome these limitations. By effectively removing polyatomic interferences, rapid, accurate, semiquantitative screening of a wide range of sample types for most analyte elements is possible. In this work, a full mass range, semiquant screen was performed in

less than 3 minutes total sample-to-sample time with good accuracy for most elements, when measuring three different certified reference materials.

For more information, see Application note:
Faster, Simpler, More Accurate Semiquantitative Analysis using the Agilent 7500cx ICP-MS, 5989-6662EN, available from:
www.agilent.com/chem/icpms

Table 3 and 4 have been simplified to show only those elements with reference values, although many other elements were determined in each reference material.

Element	NIST 1640 Certified Value	SQ Conc.	Unit	Recovery
9 Be	34.94	33.42	ug/L	95.6%
11 B	301.1	335.83	ug/L	111.5%
23 Na	29.35	22.25	mg/L	75.8%
24 Mg	5.819	4.24	mg/L	72.9%
27 Al	52	48.92	ug/L	94.1%
39 K	994	919.17	ug/L	92.5%
42 Ca	7.045	5.81	ug/L	82.4%
51 V	12.99	12.83	ug/L	98.8%
52 Cr	38.6	36.58	ug/L	94.8%
55 Mn	121.5	121.67	ug/L	100.1%
56 Fe	34.3	30.92	ug/L	90.1%
59 Co	20.28	19.75	ug/L	97.4%
60 Ni	27.4	25.83	ug/L	94.3%
63 Cu	85.2	81.17	ug/L	95.3%
66 Zn	53.2	51.83	ug/L	97.4%
75 As	26.67	27.75	ug/L	104.0%
78 Se	21.96	24.08	ug/L	109.7%
88 Sr	124.2	122.50	ug/L	98.6%
95 Mo	46.75	46.17	ug/L	98.8%
107 Ag	7.62	7.31	ug/L	95.9%
111 Cd	22.79	21.50	ug/L	94.3%
121 Sb	13.79	12.83	ug/L	93.1%
137 Ba	148	139.17	ug/L	94.0%
208 Pb	27.89	23.5	ug/L	84.3%

Table 3. Results of helium collision mode semiquant analysis of NIST 1640 standard reference water

LGC 6010 Hard Drinking Water				LGC 6177 Landfill Leachate		
Element	LGC Certified value (ug/L)	SQ Conc. (ug/L)	Recovery (%)	LGC Certified value (ug/L)	SQ Conc. (ug/L)	Recovery (%)
10 B	N/A	83	N/A	9,800	6,700	68.4%
23 Na	21,900	20,000	91.3%	1,750,000	1,500,000	85.7%
24 Mg	4,200	3,700	88.1%	73,500	62,000	84.4%
27 Al	208	160	76.9%	N/A	110	N/A
31 P	N/A	670	N/A	11,500	12,000	104.3%
39 K	5,100	5,100	100.0%	780,000	810,000	103.8%
44 Ca	83,200	73,000	87.7%	74,800	77,000	102.9%
52 Cr	48	51	106.3%	180	160	88.9%
55 Mn	48	45	93.8%	140	130	92.9%
56 Fe	236	240	101.7%	3,800	3,300	86.8%
60 Ni	48	42	87.5%	210	170	81.0%
66 Zn	542	540	99.6%	260	250	96.2%
75 As	55	49	89.1%	N/A	86	N/A
78 Se	9.5	13	136.8%	N/A	<16.00	N/A
107 Ag	6.2	4.3	69.4%	N/A	1.8	N/A
121 Sb	11.9	13	109.2%	N/A	5	N/A
137 Ba	116	110	94.8%	N/A	770	N/A
208 Pb	95	92	96.8%	N/A	17	N/A

Table 4 Results of helium collision mode semiquant analysis of LGC 6010 Hard Drinking Water and LGC 6177 Landfill Leachate standard reference materials

Winter Plasma Conference 2007: Focus on Agilent ICP-MS Users

It was Agilent's pleasure to welcome more than 180 users to the Agilent ICP-MS User Meeting in Taormina, Sicily – thanks to you all for making the evening such a great success. Although we didn't feature users' work at the user meeting, it was noted from reviewing the conference poster presentations that Agilent's ICP-MS is the most widely used instrumentation by the active European research and academic community. Agilent ICP-MS was cited in 78 poster publications, significantly more than ICP-MS from other manufacturers. Congratulations also go to the following poster prize winners – all Agilent ICP-MS users:

- Carsten Engelhard, Uni Münster
- Katharina Blümlein, Uni. Aberdeen
- Daniel Pröfrock, GKSS
- Eva Krupp, Uni. Aberdeen

The **3rd European Award for Plasma Spectrochemistry** – sponsored by Agilent Technologies Europe, was awarded to Prof. Dr. Ing. Klaus Gustav Heumann of Johannes Gutenberg-University Mainz (ret.) for his outstanding contribution in the field of plasma spectrochemistry.

Front page photo: Agilent ICP-MS Product Specialist Emmett Soffey. Emmett is based in Bellevue, WA, USA.

Recorded e-Seminars

Watch and listen to the latest Agilent ICP-MS e-Seminars at your leisure.

Title: **Introducing the Agilent 7500cx**, Simpler, Faster, More Accurate ICP-MS
Presenter: Steve Wilbur – ICP-MS Applications Specialist, Agilent Technologies

Title: **Agilent 4500 ICP-MS User Information e-Seminar**
Presenter: Steve Wilbur – ICP-MS Applications Specialist, Agilent Technologies

Go to: **www.agilent.com/chem/icpms-eseminars**
Click on the title of interest, and follow the instructions given.

4 Months Until 4500 Series End of Support

A reminder that Agilent will continue to fully support all 4500 Series instruments until their End of Support (EOS) date of October 31, 2007.

Labs that rely on their Agilent 4500 for all ICP-MS analysis, where the 4500 is the only ICP-MS in the lab, are advised to plan now to replace their instrument. See Recorded e-Seminar for more information at **www.agilent.com.chem/icpms-eseminars** or contact your Agilent support sales representative.

New Agilent ICP-MS Users

A very warm welcome to all companies and institutions that have recently added an Agilent ICP-MS to their analytical facilities. Remember to join the Agilent web-based ICP-MS User Forum – the place where you can exchange information relating to your new ICP-MS. You will also find a host of resources in the Forum designed to help you get the most from your 7500. The latest addition is an 11-page Guide to LC-ICP-MS that provides details on configuration through to data acquisition tips using Plasma Chromatographic Software.

To access the Forum, you will simply need to log-in to the Agilent web site, or register if you haven't already, and enter your instrument's serial number on your first visit only. Look for the link to the ICP-MS User Forum from: **www.agilent.com/chem/icpms**

Trade Shows and Conferences

JAIMA Show 2007, Aug 29 to 31, 2007, Makuhari Messe, Japan
www.jaimashow.jp/english

TraceSpec 2007, Sept 4 to Sept 7, 2007, Munster, Germany
www.speciation.net/event/TraceSpec2007

Application of Mass Spectrometry to Speciation Analysis in the Life Sciences, 20th Sept 2007, London, UK, **www.aamg-rsc.org**

Agilent ICP-MS Publications

To view and download these latest publications, go to www.agilent.com/chem/icpms and look under "Library Information"

- 7500 Series Brochure: Simpler. Faster. More Accurate. 5989-6410EN (Japanese, Chinese, German, French, Spanish and Italian language versions also available)
- 7500 Series ICP-MS Specifications Guide, 5989-6493EN
- Application note: Faster, Simpler, More Accurate Semiquantitative Analysis using the Agilent 7500cx ICP-MS, 5989-6662EN
- Application note: Performance Characteristics of the Agilent 7500cx, 5989-6663EN

Agilent ICP-MS Journal Editor

Karen Morton for Agilent Technologies
e-mail: editor@agilent.com

Printed in the U.S.A. June 30, 2007
5989-6525EN

Agilent Technologies