

Supplementary Material for

Analytical considerations associated with implementing M^{2+} correction factors to address false positives on As and Se within U.S. EPA method 200.8

Skyler Smith,^a Nicole Hanks,^b Patricia A. Creed,^c Kasey Kovalcik,^d Robert Wilson,^e Kevin Kubachka,^e Judith A. Brisbin,^f Julio Landero Figueroa^g and John T. Creed^{c,*}

^a University of Cincinnati/U.S. Environmental Protection Agency (USEPA) Research Trainee, National Exposure Research Laboratory (NERL), Cincinnati, OH 45268, USA

^b Student Service Contractor, USEPA, NERL, Cincinnati, OH 45268, USA

^c USEPA, NERL, Cincinnati, OH 45268, USA

^d USEPA, NERL, Research Triangle Park, NC 27711, USA

^e U.S. Food and Drug Administration, Forensic Chemistry Center, Cincinnati, OH 45237, USA

^f USEPA, Office of Ground Water and Drinking Water, Cincinnati, OH 45268, USA

^g University of Cincinnati, Department of Chemistry, Cincinnati, OH 45221, USA

*Corresponding author: Dr. John T. Creed, US EPA, 26 W. Martin Luther King Drive, Cincinnati, OH 45268; phone: 513-569-7833; fax: 513-569-7757; email:

creed.jack@epa.gov

The views expressed in this article are those of the authors and do not necessarily reflect the views or policies of the U.S. Environmental Protection Agency. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Supplementary Material: M^{2+} correction equations for figures and data tables

A. Use of external rare earth element standard to estimate the M^{2+} correction factor

There is a column heading in the data tables labeled “External Correction.” In this column, the M^{2+} correction factor is estimated using an external 50 ppb standard solution of the rare earth element, and the estimate is generated in narrow resolution using a half-mass approach. The external solution–based equation described below uses the $^{150}\text{Nd}^{2+}$ correction on m/z 75 as an example. Prior to beginning sample analysis within a batch, estimates for $^{143}\text{Nd}^{2+}$ and $^{143}\text{Nd}^{1+}$ are obtained in narrow resolution mode using a 50 ppb Nd standard. During this analysis, estimates for $^{143}\text{Nd}^{1+}$ and $^{150}\text{Nd}^{1+}$ are also obtained in normal resolution mode to allow ^{143}Nd cps in the samples to be converted to ^{150}Nd cps. These estimates are used to generate a fixed Nd^{2+} correction factor that will be used to estimate the $^{150}\text{Nd}^{2+}$ signal on m/z 75 for all samples in the batch. Because the M^{2+} correction factor is estimated in narrow resolution mode and the batch analysis is conducted in normal resolution mode, an additional conversion factor is incorporated into the Nd^{2+} correction factor below to correct for any differences between these two analysis modes. This term is estimated in Figure 5 as a function of helium flow for all rare earth elements and approaches unity at low helium flow rates.

$$\begin{array}{c}
 \begin{array}{c} \frac{71.5}{143} \text{Nd} \\ \text{Narrow External} \end{array} M^{2+} \text{ Correction Factor} = \\
 \left(\frac{[71.5 \text{ cps}]_{\text{Narrow External}}}{[143 \text{ cps}]_{\text{Narrow External}}} \right) * \left(\frac{\frac{[71.5 \text{ cps}]_{\text{Normal External LLS}}}{[143 \text{ cps}]_{\text{Normal External LLS}}}}{\frac{[71.5 \text{ cps}]_{\text{Narrow External LLS}}}{[143 \text{ cps}]_{\text{Narrow External LLS}}}} \right) * \left(\frac{[150 \text{ cps}]_{\text{Normal External}}}{[143 \text{ cps}]_{\text{Normal External}}} \right) \\
 \text{Converts } M^{2+} \text{ Correction Factor from Narrow to Normal Resolution} \quad \text{Isotopic Conversion between monitored and interference producing isotope}
 \end{array}$$

The above Nd^{2+} correction factor is calculated in Excel and is then entered into the Agilent software within the interference correction equation as follows:

$$\begin{array}{c}
 [75]_{\text{Normal Sample}} = \\
 \left[[75]_{\text{Normal Sample}} * 1 \right] - \left[[143]_{\text{Normal Sample}} * \frac{71.5}{143} \text{Nd} \frac{\text{Narrow External}}{\text{Normal External}} M^{2+} \text{ Correction Factor} \right]
 \end{array}$$

The above approach is also applicable to Sm and Gd corrections. For all data analysis conducted, the 74.5-149 and 77.5-155 M^{2+} - M^{1+} pairs were used for Sm and Gd, respectively.

B. Estimating the M^{2+} correction factors using an in-sample approach

In the data tables, there is a column heading labeled “In-Sample Correction.” In this column, the M^{2+} correction factor is estimated using an in-sample–half-mass approach. Because the in-sample data are collected in narrow mode, this approach eliminates the need for the narrow to normal conversion factor associated with the “external correction” approach described above. However, an estimate of the isotopic ratio between ^{143}Nd and ^{150}Nd in narrow mode is required. The equation below uses the $^{150}\text{Nd}^{2+}$ correction on m/z 75 as an example.

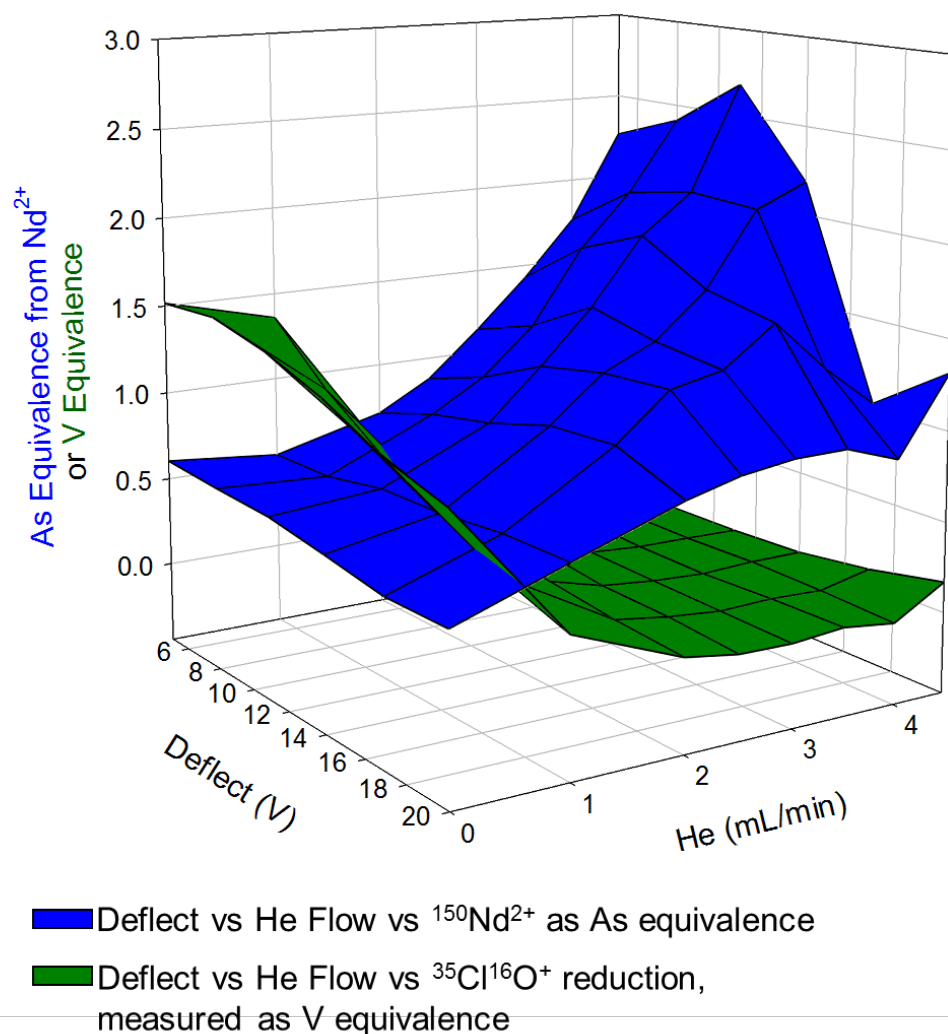
$$^{71.5}_{143}\text{Nd}_{\text{In-Sample}}^{\text{Narrow}} M^{2+} \text{ Correction Factor} = \frac{[71.5 \text{ cps}]_{\text{In-Sample}}^{\text{Narrow}}}{[143 \text{ cps}]_{\text{In-Sample}}^{\text{Narrow}}} * \frac{[150 \text{ cps}]_{\text{External}}^{\text{Narrow}}}{[143 \text{ cps}]_{\text{External}}^{\text{Narrow}}}$$

The sample-specific Nd^{2+} correction factor above is calculated in Excel and then entered into the Agilent software within the interference correction equation as follows:

$$[75]_{\text{In-Sample}}^{\text{Narrow}} = \left[[75]_{\text{In-Sample}}^{\text{Narrow}} * 1 \right] - \left[[143]_{\text{In-Sample}}^{\text{Narrow}} * ^{71.5}_{143}\text{Nd}_{\text{In-Sample}}^{\text{Narrow}} M^{2+} \text{ Correction Factor} \right]$$

The above approach is also applicable to Sm and Gd corrections. In all data analysis conducted, the 74.5-149 and 77.5-155 M^{2+} - M^{1+} pairs were used for Sm and Gd, respectively. All in-sample M^{2+} estimates required manual abundance sensitivity evaluations at the adjacent masses to the M^{2+} ion. The square brackets in the above equations represents the signal at the associated m/z.

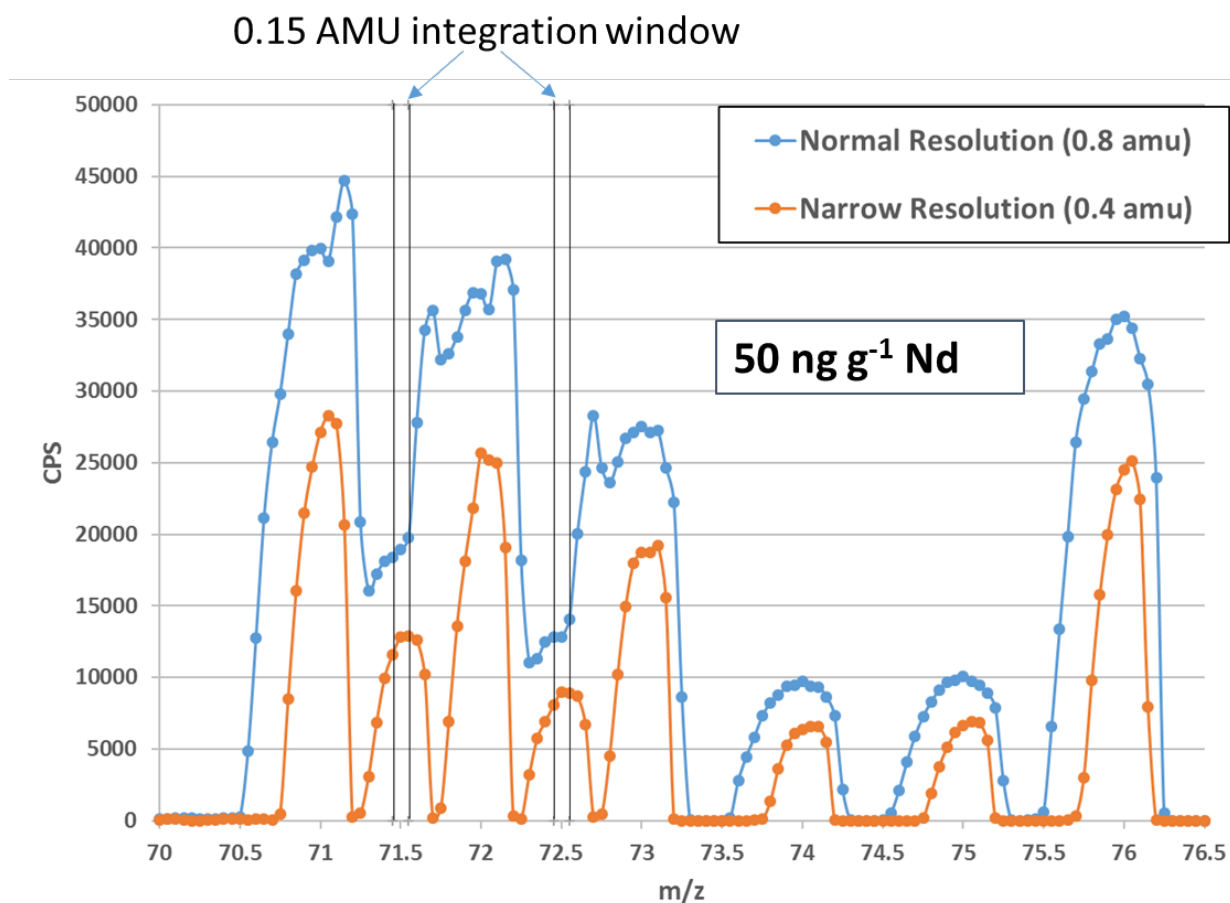
Figure S1. Arsenic equivalence from $^{150}\text{Nd}^{2+}$ and ^{51}V equivalence from $^{16}\text{O}^{35}\text{Cl}^+$ as a function of He flow and deflect potential at octopole of -18^{1-3}



Notes:

1. The m/z 75 response from $^{150}\text{Nd}^{+2}$ is estimated by using the response at m/z 71.5 and multiplying it by the tune-specific ^{150}Nd -to- ^{143}Nd ratio. This response is converted to As equivalence based on the response from an As standard associated with that specific He flow and deflect potential. The y-axis is in ppb.
2. The vanadium equivalence is calculated based on the response from a 10-ppb V standard associated with that specific He flow and deflect potential. The y-axis is in ppb.
3. The data are collected in narrow resolution mode (0.4 amu at 10% peak height) using selective ion monitoring with a dwell time of 0.3 sec/amu at an octopole of -18V and an energy discrimination of 5 V.

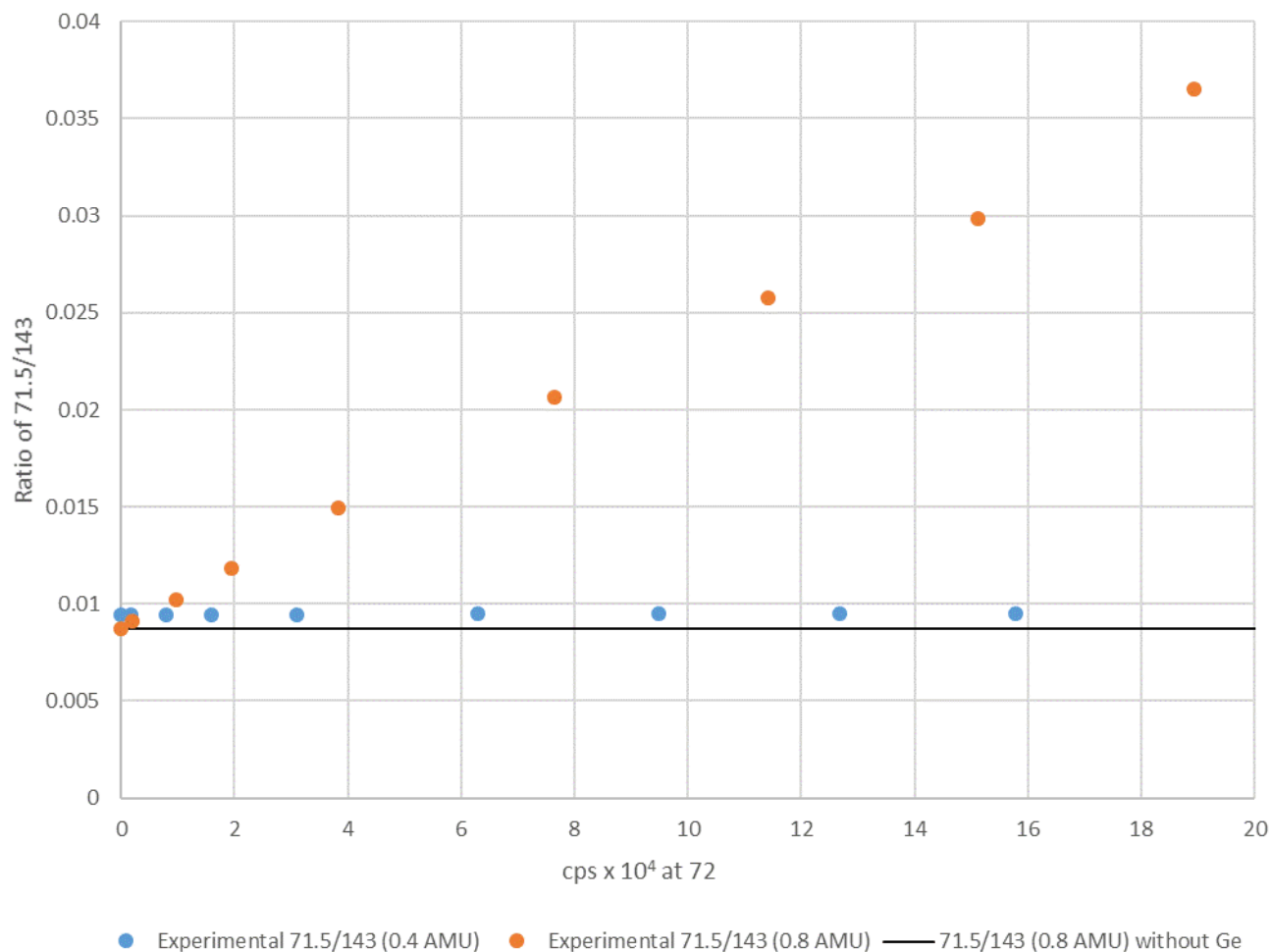
Figure S2A. Abundance sensitivity implications of using narrow and standard resolution tunes to estimate half-mass correction factors for Nd^{2+1}



Note:

1. The data were collected in scan mode using a 50-ppb Nd standard in both narrow resolution mode (0.4 amu at 10% peak height) and normal resolution mode (0.8 amu at 10% peak height). Five instrument replicates were averaged using a dwell time of 0.1 sec/point. Each point represents 0.05 amu, and the Nd^{2+} response estimate is generated using a 0.15-amu integration window.

Figure S2B. Abundance sensitivity implications of estimating $^{143}\text{Nd}^{2+}$ correction factor with increasing signal at m/z 72¹



Note:

1. The data were collected in both narrow resolution mode (0.4 amu at 10% peak height) and normal resolution mode (0.8 amu at 10% peak height) using a dwell time of 0.6 sec/amu. All data were collected with an octopole of -18 V and with an energy discrimination of 8 V.

Supplementary Materials: Acquisition Method for Table 1 and 2

Below is the Acquisition Methods used for the data in Table 1 and 2. The Acquisition Methods used in Figure 5 were also used in the calculation of the Half Mass Multiplier for the standards.

Acquisition Method

[ACQ PARAMETERS]

Data Folder	D:\Agilent\ICPMH\1\DATA\1-31-17_No Corrections_IS corr_Std Mode_Samples.b\Wash_1-31-17_Neat Solution Corrections_Table 1_Std Mode_Samples.D
Acq Mode	Spectrum
Peak Pattern	3 points
Replicates	10
Sweeps/Replicate	100

Monitored Masses:

Mass	Element Name
66	
75	
78	
82	
163	

Tune Mode #1:	4.5 ml He
Quick Scan	ON
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Standard
Number of Masses	19

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
66		OFF	0.3	Auto
75		OFF	0.3	Auto
78		OFF	0.3	Auto
82		OFF	0.3	Auto
115		OFF	0.3	Auto
134		OFF	0.3	Auto
135		OFF	0.3	Auto
137		OFF	0.3	Auto
140		OFF	0.3	Auto
143		OFF	0.3	Auto
145		OFF	0.3	Auto
146		OFF	0.3	Auto
147		OFF	0.3	Auto
149		OFF	0.3	Auto
150		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto
163		OFF	0.3	Auto

Tune Mode #2:	2.5 ml He
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Standard
Number of Masses	19

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
66		OFF	0.3	Auto
75		OFF	0.3	Auto
78		OFF	0.3	Auto
82		OFF	0.3	Auto
115		OFF	0.3	Auto
134		OFF	0.3	Auto
135		OFF	0.3	Auto
137		OFF	0.3	Auto
140		OFF	0.3	Auto
143		OFF	0.3	Auto
145		OFF	0.3	Auto
146		OFF	0.3	Auto
147		OFF	0.3	Auto
149		OFF	0.3	Auto
150		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto
163		OFF	0.3	Auto

[MONITOR]

Monitor Mass	
Mass	
(Numerator)	(Denominator)
66	
75	
78	

Acquisition Method

82
163

[PERIPUMP/ISIS]

Sample Introduction General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)	0.3	rps
Uptake Time	30	sec
Stabilize	40	sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec

Post Run (Rinse)

Rinse Vial 1	1	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 1)	60	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	2	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 2)	60	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec

Intelligent Rinse

Intelligent Rinse Off

Preemptive Rinse

Preemptive Rinse	On	
Start rinse before acquisition complete	40	sec
Move to the next rinse step at acquisition complete	No	

[TUNE]

Tune Way Custom Tune

Tune Mode #1:

(Plasma)	4.5 ml He	
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2: 2.5 ml He

Acquisition Method

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-31-17_Narrow Correction factors.b\93F.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 10
 Sweeps/Replicate 100

Monitored Masses:

Mass Element Name
 66
 75
 78

Tune Mode #1: 4.5 ml He
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 46

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
60		OFF	0.3	Auto
61		OFF	0.3	Auto
62		OFF	0.3	Auto
63		OFF	0.3	Auto
64		OFF	0.3	Auto
65		OFF	0.3	Auto
66		OFF	0.3	Auto
67		ON	0.3	Auto
68		ON	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
79		OFF	0.3	Auto
115		OFF	0.3	Auto
134		OFF	0.3	Auto
135		OFF	0.3	Auto
136		OFF	0.3	Auto
137		OFF	0.3	Auto

Acquisition Method

138	OFF	0.3	Auto
139	OFF	0.3	Auto
140	OFF	0.3	Auto
141	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
151	OFF	0.3	Auto
152	OFF	0.3	Auto
153	OFF	0.3	Auto
154	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
158	OFF	0.3	Auto

Tune Mode #2: 2.5 ml He
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 46

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
60		OFF	0.3	Auto
61		OFF	0.3	Auto
62		OFF	0.3	Auto
63		OFF	0.3	Auto
64		OFF	0.3	Auto
65		OFF	0.3	Auto
66		OFF	0.3	Auto
67		ON	0.3	Auto
68		ON	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75		OFF	0.3	Auto

Acquisition Method

76	OFF	0.3	Auto
77	ON	0.3	Auto
78	ON	0.3	Auto
79	OFF	0.3	Auto
115	OFF	0.3	Auto
134	OFF	0.3	Auto
135	OFF	0.3	Auto
136	OFF	0.3	Auto
137	OFF	0.3	Auto
138	OFF	0.3	Auto
139	OFF	0.3	Auto
140	OFF	0.3	Auto
141	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
151	OFF	0.3	Auto
152	OFF	0.3	Auto
153	OFF	0.3	Auto
154	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
158	OFF	0.3	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)		(Denominator)
-------------	--	---------------

66

75

78

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)	0.3	rps
-------------------------------	-----	-----

Uptake Time	30	sec
-------------	----	-----

Stabilize	40	sec
-----------	----	-----

Acquisition Method

Post Run (Probe Rinse)		
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec
Post Run (Rinse)		
Rinse Vial 1	1	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 1)	60	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	2	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 2)	60	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	40	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:		
(Plasma)	4.5 ml He	
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Acquisition Method

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2: 2.5 ml He

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min

Acquisition Method

H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-31-17_Neat Solution Corrections_Table 1_Std Mode.b\93B.d
 Acq Mode Spectrum
 Peak Pattern 20 points
 Replicates 10
 Sweeps/Replicate 100

Monitored Masses:

Mass Element Name
 66
 71
 75
 78
 163

Tune Mode #1: 4.5 ml He
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Standard
 Number of Masses 29

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
66		OFF	2	Auto
67		OFF	2	Auto
68		OFF	2	Auto
69		OFF	2	Auto
71		OFF	2	Auto
72		OFF	2	Auto
73		OFF	2	Auto
74		OFF	2	Auto
75		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
115		OFF	2	Auto
131		OFF	2	Auto
132		OFF	2	Auto
134		OFF	2	Auto
135		OFF	2	Auto
137		OFF	2	Auto
140		OFF	2	Auto
143		OFF	2	Auto
145		OFF	2	Auto
146		OFF	2	Auto
147		OFF	2	Auto
149		OFF	2	Auto
150		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto
163		OFF	2	Auto

Tune Mode #2: 2.5 ml He
 Quick Scan OFF
 Independent P/A Factors OFF

Acquisition Method

Stabilization Time 0 sec
 Resolution Standard
 Number of Masses 29

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
66		OFF	2	Auto
67		OFF	2	Auto
68		OFF	2	Auto
69		OFF	2	Auto
71		OFF	2	Auto
72		OFF	2	Auto
73		OFF	2	Auto
74		OFF	2	Auto
75		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
115		OFF	2	Auto
131		OFF	2	Auto
132		OFF	2	Auto
134		OFF	2	Auto
135		OFF	2	Auto
137		OFF	2	Auto
140		OFF	2	Auto
143		OFF	2	Auto
145		OFF	2	Auto
146		OFF	2	Auto
147		OFF	2	Auto
149		OFF	2	Auto
150		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto
163		OFF	2	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

66
 71
 75
 78
 163

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)

0.3 rps

Uptake Time

30 sec

Stabilize

40 sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)

0.3 rps

Acquisition Method

Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec

Post Run (Rinse)

Rinse Vial 1	1	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 1)	60	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	2	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 2)	60	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec

Intelligent Rinse

Intelligent Rinse	Off
-------------------	-----

Preemptive Rinse

Preemptive Rinse	On
Start rinse before acquisition complete	40 sec
Move to the next rinse step at acquisition complete	No

[TUNE]

Tune Way	Custom Tune
----------	-------------

Tune Mode #1:

(Plasma)	4.5 ml He	
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes
He Flow	On
He Flow Rate	4.5 ml/min

Acquisition Method

H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2:	2.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-30-17_Neat Solution Corrections_Table 1.b\Blank 1.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 10
 Sweeps/Replicate 100

Monitored Masses:

Mass Element Name
 66
 75
 78

Tune Mode #1: 4.5 ml He
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 46

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
60		OFF	0.3	Auto
61		OFF	0.3	Auto
62		OFF	0.3	Auto
63		OFF	0.3	Auto
64		OFF	0.3	Auto
65		OFF	0.3	Auto
66		OFF	0.3	Auto
67		ON	0.3	Auto
68		ON	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
79		OFF	0.3	Auto
115		OFF	0.3	Auto
134		OFF	0.3	Auto
135		OFF	0.3	Auto
136		OFF	0.3	Auto
137		OFF	0.3	Auto
138		OFF	0.3	Auto
139		OFF	0.3	Auto
140		OFF	0.3	Auto
141		OFF	0.3	Auto

Acquisition Method

142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
151	OFF	0.3	Auto
152	OFF	0.3	Auto
153	OFF	0.3	Auto
154	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
158	OFF	0.3	Auto

Tune Mode #2: 2.5 ml He
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 46

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
60		OFF	0.3	Auto
61		OFF	0.3	Auto
62		OFF	0.3	Auto
63		OFF	0.3	Auto
64		OFF	0.3	Auto
65		OFF	0.3	Auto
66		OFF	0.3	Auto
67		ON	0.3	Auto
68		ON	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
79		OFF	0.3	Auto
115		OFF	0.3	Auto
134		OFF	0.3	Auto
135		OFF	0.3	Auto
136		OFF	0.3	Auto

Acquisition Method

137	OFF	0.3	Auto
138	OFF	0.3	Auto
139	OFF	0.3	Auto
140	OFF	0.3	Auto
141	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
151	OFF	0.3	Auto
152	OFF	0.3	Auto
153	OFF	0.3	Auto
154	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
158	OFF	0.3	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator) (Denominator)

66

75

78

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump) 0.3 rps

Uptake Time 30 sec

Stabilize 40 sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Port (Sample) 10 sec

Rinse at Rinse Port (Std) 10 sec

Post Run (Rinse)

Rinse Vial 1 1

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Vial (Step 1) 60 sec

Rinse at Rinse Port (Step 1) sec

Rinse Vial 2 2

Acquisition Method

Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 2)	60	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	40	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:	4.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	

Acquisition Method

3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #2:	2.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-30-17_Neat Solution Corrections_Table 1.b\Blank 1.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 10
 Sweeps/Replicate 100

Monitored Masses:

Mass Element Name
 66
 75
 78

Tune Mode #1: 4.5 ml He
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 46

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
60		OFF	0.3	Auto
61		OFF	0.3	Auto
62		OFF	0.3	Auto
63		OFF	0.3	Auto
64		OFF	0.3	Auto
65		OFF	0.3	Auto
66		OFF	0.3	Auto
67		ON	0.3	Auto
68		ON	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
79		OFF	0.3	Auto
115		OFF	0.3	Auto
134		OFF	0.3	Auto
135		OFF	0.3	Auto
136		OFF	0.3	Auto
137		OFF	0.3	Auto
138		OFF	0.3	Auto
139		OFF	0.3	Auto
140		OFF	0.3	Auto
141		OFF	0.3	Auto

Acquisition Method

142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
151	OFF	0.3	Auto
152	OFF	0.3	Auto
153	OFF	0.3	Auto
154	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
158	OFF	0.3	Auto

Tune Mode #2: 2.5 ml He
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 46

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
60		OFF	0.3	Auto
61		OFF	0.3	Auto
62		OFF	0.3	Auto
63		OFF	0.3	Auto
64		OFF	0.3	Auto
65		OFF	0.3	Auto
66		OFF	0.3	Auto
67		ON	0.3	Auto
68		ON	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
79		OFF	0.3	Auto
115		OFF	0.3	Auto
134		OFF	0.3	Auto
135		OFF	0.3	Auto
136		OFF	0.3	Auto

Acquisition Method

137	OFF	0.3	Auto
138	OFF	0.3	Auto
139	OFF	0.3	Auto
140	OFF	0.3	Auto
141	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
151	OFF	0.3	Auto
152	OFF	0.3	Auto
153	OFF	0.3	Auto
154	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
158	OFF	0.3	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator) (Denominator)

66

75

78

[PERIPUMP/ISIS]

Sample Introduction General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump) 0.3 rps

Uptake Time 30 sec

Stabilize 40 sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Port (Sample) 10 sec

Rinse at Rinse Port (Std) 10 sec

Post Run (Rinse)

Rinse Vial 1 1

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Vial (Step 1) 60 sec

Rinse at Rinse Port (Step 1) sec

Rinse Vial 2 2

Acquisition Method

Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 2)	60	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	40	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:	4.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	

Acquisition Method

3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #2:	2.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-15-17 Regional waters & standards.b\3BW100_41.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 10
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
9	Be
59	Co
111	Cd
206	Pb
208	Pb

Tune Mode #1: 4.5 ml He
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 37

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9	Be	OFF	0.3	Auto
45		OFF	0.3	Auto
51		OFF	0.3	Auto
53		OFF	0.3	Auto
59	Co	OFF	0.3	Auto
60	Ni	OFF	0.3	Auto
63		OFF	0.3	Auto
64	Zn	OFF	0.3	Auto
65		OFF	0.3	Auto
66	Zn	OFF	0.3	Auto
67	Zn	OFF	0.3	Auto
68	Zn	OFF	0.3	Auto
69	Ga	OFF	0.3	Auto
71	Ga	OFF	0.3	Auto
72		OFF	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75	As	OFF	0.3	Auto
77		OFF	0.3	Auto
78		OFF	0.3	Auto
89		OFF	0.3	Auto
111	Cd	OFF	0.3	Auto
115		OFF	0.3	Auto
135	Ba	OFF	0.3	Auto
137	Ba	OFF	0.3	Auto
143		OFF	0.3	Auto
145		OFF	0.3	Auto

Acquisition Method

147		OFF	0.3	Auto
149		OFF	0.3	Auto
150		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto
206	Pb	OFF	0.3	Auto
207	Pb	OFF	0.3	Auto
208	Pb	OFF	0.3	Auto
209		OFF	0.3	Auto

Tune Mode #2: 2.5 ml He
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 37

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9	Be	OFF	0.3	Auto
45		OFF	0.3	Auto
51		OFF	0.3	Auto
53		OFF	0.3	Auto
59	Co	OFF	0.3	Auto
60	Ni	OFF	0.3	Auto
63		OFF	0.3	Auto
64	Zn	OFF	0.3	Auto
65		OFF	0.3	Auto
66	Zn	OFF	0.3	Auto
67	Zn	OFF	0.3	Auto
68	Zn	OFF	0.3	Auto
69	Ga	OFF	0.3	Auto
71	Ga	OFF	0.3	Auto
72		OFF	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75	As	OFF	0.3	Auto
77		OFF	0.3	Auto
78		OFF	0.3	Auto
89		OFF	0.3	Auto
111	Cd	OFF	0.3	Auto
115		OFF	0.3	Auto
135	Ba	OFF	0.3	Auto
137	Ba	OFF	0.3	Auto
143		OFF	0.3	Auto
145		OFF	0.3	Auto
147		OFF	0.3	Auto
149		OFF	0.3	Auto
150		OFF	0.3	Auto
155		OFF	0.3	Auto

Acquisition Method

156		OFF	0.3	Auto
157		OFF	0.3	Auto
206	Pb	OFF	0.3	Auto
207	Pb	OFF	0.3	Auto
208	Pb	OFF	0.3	Auto
209		OFF	0.3	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

9

59

111

206

208

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump) 0.3 rps

Uptake Time 30 sec

Stabilize 40 sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Port (Sample) 10 sec

Rinse at Rinse Port (Std) 10 sec

Post Run (Rinse)

Rinse Vial 1 1

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Vial (Step 1) 60 sec

Rinse at Rinse Port (Step 1) sec

Rinse Vial 2 2

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Vial (Step 2) 60 sec

Rinse at Rinse Port (Step 2) sec

Rinse Vial 3

Rinse Speed (Nebulizer Pump) rps

Rinse at Rinse Vial (Step 3) sec

Rinse at Rinse Port (Step 3) sec

Intelligent Rinse

Intelligent Rinse Off

Preemptive Rinse

Preemptive Rinse On

Acquisition Method

Start rinse before acquisition complete	40	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:	4.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #2:	2.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps

Acquisition Method

S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-15-17 Correction Factors Narrow.b\3BW100_5.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 10
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
9	Be
59	Co
111	Cd
206	Pb
208	Pb

Tune Mode #1: 4.5 ml He

Quick Scan ON

Independent P/A Factors OFF

Stabilization Time 20 sec

Resolution Narrow Peak

Number of Masses 35

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9	Be	OFF	0.3	Auto
45		OFF	0.3	Auto
51		OFF	0.3	Auto
53		OFF	0.3	Auto
59	Co	OFF	0.3	Auto
60	Ni	OFF	0.3	Auto
64	Zn	OFF	0.3	Auto
66	Zn	OFF	0.3	Auto
67	Zn	ON	0.3	Auto
68	Zn	ON	0.3	Auto
69	Ga	OFF	0.3	Auto
71	Ga	ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75	As	OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
89		OFF	0.3	Auto
111	Cd	OFF	0.3	Auto
115		OFF	0.3	Auto
135	Ba	OFF	0.3	Auto
137	Ba	OFF	0.3	Auto
143		OFF	0.3	Auto
145		OFF	0.3	Auto
147		OFF	0.3	Auto
149		OFF	0.3	Auto

Acquisition Method

150		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto
206	Pb	OFF	0.3	Auto
207	Pb	OFF	0.3	Auto
208	Pb	OFF	0.3	Auto
209		OFF	0.3	Auto

Tune Mode #2: 2.5 ml He
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 35

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9	Be	OFF	0.3	Auto
45		OFF	0.3	Auto
51		OFF	0.3	Auto
53		OFF	0.3	Auto
59	Co	OFF	0.3	Auto
60	Ni	OFF	0.3	Auto
64	Zn	OFF	0.3	Auto
66	Zn	OFF	0.3	Auto
67	Zn	ON	0.3	Auto
68	Zn	ON	0.3	Auto
69	Ga	OFF	0.3	Auto
71	Ga	ON	0.3	Auto
72		ON	0.3	Auto
73		ON	0.3	Auto
74		ON	0.3	Auto
75	As	OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
89		OFF	0.3	Auto
111	Cd	OFF	0.3	Auto
115		OFF	0.3	Auto
135	Ba	OFF	0.3	Auto
137	Ba	OFF	0.3	Auto
143		OFF	0.3	Auto
145		OFF	0.3	Auto
147		OFF	0.3	Auto
149		OFF	0.3	Auto
150		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto
206	Pb	OFF	0.3	Auto
207	Pb	OFF	0.3	Auto

Acquisition Method

208	Pb	OFF	0.3	Auto
209		OFF	0.3	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

9

59

111

206

208

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)	0.3	rps
-------------------------------	-----	-----

Uptake Time	30	sec
-------------	----	-----

Stabilize	40	sec
-----------	----	-----

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)	0.3	rps
------------------------------	-----	-----

Rinse at Rinse Port (Sample)	10	sec
------------------------------	----	-----

Rinse at Rinse Port (Std)	10	sec
---------------------------	----	-----

Post Run (Rinse)

Rinse Vial 1	1
--------------	---

Rinse Speed (Nebulizer Pump)	0.3	rps
------------------------------	-----	-----

Rinse at Rinse Vial (Step 1)	60	sec
------------------------------	----	-----

Rinse at Rinse Port (Step 1)	sec
------------------------------	-----

Rinse Vial 2	2
--------------	---

Rinse Speed (Nebulizer Pump)	0.3	rps
------------------------------	-----	-----

Rinse at Rinse Vial (Step 2)	60	sec
------------------------------	----	-----

Rinse at Rinse Port (Step 2)	sec
------------------------------	-----

Rinse Vial 3

Rinse Speed (Nebulizer Pump)	rps
------------------------------	-----

Rinse at Rinse Vial (Step 3)	sec
------------------------------	-----

Rinse at Rinse Port (Step 3)	sec
------------------------------	-----

Intelligent Rinse

Intelligent Rinse	Off
-------------------	-----

Preemptive Rinse

Preemptive Rinse	On
------------------	----

Start rinse before acquisition complete	40	sec
---	----	-----

Move to the next rinse step at acquisition complete	No
---	----

Acquisition Method

[TUNE]

Tune Way	Custom Tune	
Tune Mode #1:	4.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #2:	2.5 ml He	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		

Acquisition Method

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-15-17 Correction Factors Standard.b\3BW100_34.d
 Acq Mode Spectrum
 Peak Pattern 20 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
59	Co
63	
65	
79	

Tune Mode #1: 4.5 ml He
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 27

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59	Co	OFF	2	Auto
60	Ni	OFF	2	Auto
63		OFF	2	Auto
64	Zn	OFF	2	Auto
65		OFF	2	Auto
66	Zn	OFF	2	Auto
67	Zn	OFF	2	Auto
68	Zn	OFF	2	Auto
69	Ga	OFF	2	Auto
71	Ga	OFF	2	Auto
72		OFF	2	Auto
73		OFF	2	Auto
74		OFF	2	Auto
75	As	OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
135	Ba	OFF	2	Auto
137	Ba	OFF	2	Auto
143		OFF	2	Auto
145		OFF	2	Auto
147		OFF	2	Auto
149		OFF	2	Auto
150		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

Acquisition Method

Tune Mode #2: 2.5 ml He
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 27

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59	Co	OFF	2	Auto
60	Ni	OFF	2	Auto
63		OFF	2	Auto
64	Zn	OFF	2	Auto
65		OFF	2	Auto
66	Zn	OFF	2	Auto
67	Zn	OFF	2	Auto
68	Zn	OFF	2	Auto
69	Ga	OFF	2	Auto
71	Ga	OFF	2	Auto
72		OFF	2	Auto
73		OFF	2	Auto
74		OFF	2	Auto
75	As	OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
135	Ba	OFF	2	Auto
137	Ba	OFF	2	Auto
143		OFF	2	Auto
145		OFF	2	Auto
147		OFF	2	Auto
149		OFF	2	Auto
150		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

59

63

65

79

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Acquisition Method

Uptake Speed (Nebulizer Pump)	0.3	rps
Uptake Time	30	sec
Stabilize	40	sec
Post Run (Probe Rinse)		
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec
Post Run (Rinse)		
Rinse Vial 1	1	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 1)	60	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	2	
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Vial (Step 2)	60	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	40	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:		
(Plasma)	4.5 ml He	
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V

Acquisition Method

Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2: 2.5 ml He

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V

Acquisition Method

OctP RF	190	V
Energy Discrimination	5	V

Supplementary Materials: Acquisition Method for Figure 3A

Attached below is an example of the Acquisition Method for Deflect 5 for the Se Detection Limit data. There are also acquisition methods for Deflect 8, 11, 14, 17 and 20. But since only the deflect setting was modified these were not attached to save space. The V Equivalence data's Acquisition Methods are in the Supplementary Materials: Acquisition Methods for Figure 3B and Figure 6 section.

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-6-17 Oct -12_Def 5_ED 5 Se DL.b\3BW91B.d
Acq Mode Spectrum
Peak Pattern 3 points
Replicates 5
Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
59	
78	
115	
205	

Tune Mode #1:	He 0
Quick Scan	ON
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Narrow Peak
Number of Masses	4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto
78		OFF	3	Auto
115		OFF	0.3	Auto
205		OFF	0.3	Auto

Tune Mode #2:	1
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Narrow Peak
Number of Masses	4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto
78		OFF	3	Auto
115		OFF	0.3	Auto
205		OFF	0.3	Auto

Tune Mode #3:	2
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Narrow Peak

Acquisition Method

Number of Masses 4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto
78		OFF	3	Auto
115		OFF	0.3	Auto
205		OFF	0.3	Auto

Tune Mode #4: 2.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto
78		OFF	3	Auto
115		OFF	0.3	Auto
205		OFF	0.3	Auto

Tune Mode #5: 3
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto
78		OFF	3	Auto
115		OFF	0.3	Auto
205		OFF	0.3	Auto

Tune Mode #6: 3.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto

Acquisition Method

78	OFF	3	Auto
115	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #7:	4
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Narrow Peak
Number of Masses	4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto
78		OFF	3	Auto
115		OFF	0.3	Auto
205		OFF	0.3	Auto

Tune Mode #8:	4.5
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Narrow Peak
Number of Masses	4

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
59		OFF	0.3	Auto
78		OFF	3	Auto
115		OFF	0.3	Auto
205		OFF	0.3	Auto

[MONITOR]	
Monitor Mass	
Mass	
(Numerator)	(Denominator)
59	
78	
115	
205	

[PERIPUMP/ISIS]	
Sample Introduction	General

PeriPump/ISIS Settings	
Pre Run	
Uptake Speed (Nebulizer Pump)	0.3 rps

Acquisition Method

Uptake Time	30	sec
Stabilize	40	sec
Post Run (Probe Rinse)		
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec
Post Run (Rinse)		
Rinse Vial 1	2	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 1)	30	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	1	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 2)	30	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	0	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:		
(Plasma)	He 0	
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

Acquisition Method

(Lenses)

Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2:

1

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes
---------	-----

Acquisition Method

He Flow	On	
He Flow Rate	1	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #3:	2	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #4:	2.5	
(Plasma)		
RF Power	1550	W

Acquisition Method

RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #5:	3	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V

Acquisition Method

Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #6:

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	

Acquisition Method

3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #7:	4	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #8:	4.5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps

Acquisition Method

S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Supplementary Materials: Acquisition Methods for Figure 4

Attached below are the Acquisition Methods used for Figure 4

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-24-17 Figures 2_3_std mode.b\Blank.d
 Acq Mode Spectrum
 Peak Pattern 20 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
77	
78	
82	
155	
156	

Tune Mode #1:	NG
Quick Scan	ON
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
82		OFF	2	Auto
140		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

Tune Mode #2:	1
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto

Acquisition Method

82	OFF	2	Auto
140	OFF	2	Auto
155	OFF	2	Auto
156	OFF	2	Auto
157	OFF	2	Auto

Tune Mode #3: 2
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
82		OFF	2	Auto
140		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

Tune Mode #4: 2.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
82		OFF	2	Auto
140		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

Tune Mode #5: 3
 Quick Scan OFF
 Independent P/A Factors OFF

Acquisition Method

Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
82		OFF	2	Auto
140		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

Tune Mode #6: 3.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
82		OFF	2	Auto
140		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

Tune Mode #7: 4
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto

Acquisition Method

79	OFF	2	Auto
82	OFF	2	Auto
140	OFF	2	Auto
155	OFF	2	Auto
156	OFF	2	Auto
157	OFF	2	Auto

Tune Mode #8: 4.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 9

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
76		OFF	2	Auto
77		OFF	2	Auto
78		OFF	2	Auto
79		OFF	2	Auto
82		OFF	2	Auto
140		OFF	2	Auto
155		OFF	2	Auto
156		OFF	2	Auto
157		OFF	2	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

77

78

82

155

156

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump) 0.3 rps

Uptake Time 30 sec

Stabilize 40 sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump) 0.3 rps

Acquisition Method

Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec
Post Run (Rinse)		
Rinse Vial 1	1	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 1)	30	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	2	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 2)	30	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	0	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:	NG	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V

Acquisition Method

Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2:

1

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	1	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	

Acquisition Method

3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
 Tune Mode #3:	 2	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
 (Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
 (Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
 Tune Mode #4:	 2.5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps

Acquisition Method

S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #5:	3	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

Acquisition Method

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #6:

3.5

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

Tune Mode #7:	4	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #8:	4.5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		

Acquisition Method

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-24-17 Figures 2_3_narrow mode.b\Blank.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
77	
78	
82	
155	
156	

Tune Mode #1:	NG
Quick Scan	ON
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #2:	1
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto

Acquisition Method

157	OFF	0.3	Auto
-----	-----	-----	------

Tune Mode #3:	2
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #4:	2.5
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #5:	3
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto

Acquisition Method

82	OFF	0.3	Auto
140	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto

Tune Mode #6: 3.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #7: 4
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #8: 4.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 7

Acquisition Method

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

77

78

82

155

156

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)	0.3	rps
-------------------------------	-----	-----

Uptake Time	30	sec
-------------	----	-----

Stabilize	40	sec
-----------	----	-----

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)	0.3	rps
------------------------------	-----	-----

Rinse at Rinse Port (Sample)	10	sec
------------------------------	----	-----

Rinse at Rinse Port (Std)	10	sec
---------------------------	----	-----

Post Run (Rinse)

Rinse Vial 1	1	
--------------	---	--

Rinse Speed (Nebulizer Pump)	0.1	rps
------------------------------	-----	-----

Rinse at Rinse Vial (Step 1)	30	sec
------------------------------	----	-----

Rinse at Rinse Port (Step 1)		sec
------------------------------	--	-----

Rinse Vial 2	2	
--------------	---	--

Rinse Speed (Nebulizer Pump)	0.1	rps
------------------------------	-----	-----

Rinse at Rinse Vial (Step 2)	30	sec
------------------------------	----	-----

Rinse at Rinse Port (Step 2)		sec
------------------------------	--	-----

Rinse Vial 3

Rinse Speed (Nebulizer Pump)		rps
------------------------------	--	-----

Rinse at Rinse Vial (Step 3)		sec
------------------------------	--	-----

Acquisition Method

Rinse at Rinse Port (Step 3) sec

Intelligent Rinse

Intelligent Rinse Off

Preemptive Rinse

Preemptive Rinse On

Start rinse before acquisition complete 0 sec

Move to the next rinse step at acquisition complete No

[TUNE]

Tune Way Custom Tune

Tune Mode #1:

NG

(Plasma)

RF Power 1550 W

RF Matching 1.4 V

Smpl Depth 8 mm

Carrier Gas 0.84 l/min

Option Gas 0 %

Nebulizer Pump 0.1 rps

S/C Temp 2 °C

Gas Switch Makeup Gas

Makeup/Dilution Gas 0 l/min

(Lenses)

Extract 1 0 V

Extract 2 -160 V

Omega Bias -80 V

Omega Lens 10 V

Cell Entrance -30 V

Cell Exit -75 V

Deflect 5 V

Plate Bias -50 V

(Cell)

Use Gas No

He Flow On

He Flow Rate 0 ml/min

H2 Flow Off

H2 Flow Rate 0 ml/min

3rd Gas Flow Off

3rd Gas Flow Rate 0 %

OctP Bias -12 V

Acquisition Method

OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #2:	1	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	1	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #3:	2	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	

Acquisition Method

Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #4:	2.5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		

Acquisition Method

Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #5:	3	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	3	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #6:	3.5	
(Plasma)		

Acquisition Method

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #7:

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V

Acquisition Method

Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	4	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #8:

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min

Acquisition Method

3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-24-17 Figures 2_3_narrow mode_def 20.b\Blank.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
77	
78	
82	
155	
156	

Tune Mode #1:

NG
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #2:

1
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #3:

2
 Quick Scan OFF

Acquisition Method

Independent P/A Factors
Stabilization Time
Resolution
Number of Masses

OFF
20 sec
Narrow Peak
7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #4:
Quick Scan
Independent P/A Factors
Stabilization Time
Resolution
Number of Masses

2.5
OFF
OFF
20 sec
Narrow Peak
7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #5:
Quick Scan
Independent P/A Factors
Stabilization Time
Resolution
Number of Masses

3
OFF
OFF
20 sec
Narrow Peak
7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #6:
Quick Scan

3.5
OFF

Acquisition Method

Independent P/A Factors
Stabilization Time
Resolution
Number of Masses

OFF
20 sec
Narrow Peak
7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #7:
Quick Scan
Independent P/A Factors
Stabilization Time
Resolution
Number of Masses

4
OFF
OFF
20 sec
Narrow Peak
7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

Tune Mode #8:
Quick Scan
Independent P/A Factors
Stabilization Time
Resolution
Number of Masses

4.5
OFF
OFF
20 sec
Narrow Peak
7

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
77		ON	0.3	Auto
78		ON	0.3	Auto
82		OFF	0.3	Auto
140		OFF	0.3	Auto
155		OFF	0.3	Auto
156		OFF	0.3	Auto
157		OFF	0.3	Auto

[MONITOR]
Monitor Mass

Acquisition Method

Mass		
(Numerator)	(Denominator)	
77		
78		
82		
155		
156		
[PERIPUMP/ISIS]		
Sample Introduction	General	
PeriPump/ISIS Settings		
Pre Run		
Uptake Speed (Nebulizer Pump)	0.3	rps
Uptake Time	30	sec
Stabilize	40	sec
Post Run (Probe Rinse)		
Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec
Post Run (Rinse)		
Rinse Vial 1	1	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 1)	30	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	2	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 2)	30	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	0	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:	NG	

Acquisition Method

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2:	1	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V

Acquisition Method

Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	1	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #3:

2

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	2	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #4:

2.5

Acquisition Method

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #5:	3	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V

Acquisition Method

Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #6:

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #7:

4

Acquisition Method

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #8:	4.5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V

Acquisition Method

Cell Exit	-75	V
Deflect	20	V
Plate Bias	-50	V
(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Supplementary Materials: Acquisition Methods for Figure 5

Attached below is an example of the Acquisition Method for the 0 mL/min He flow for the standard mode Nd, standard mode Gd & Sm, narrow mode Nd and narrow mode Gd & Sm. Each mode also has a 1, 2, 3, 4, and 5 mL/min He flow but to save space these have not been included.

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-8-17 Figure 3_STANDARD mode NG_Nd Ba Ho.b\001SMPL.d
 Acq Mode Spectrum
 Peak Pattern 20 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
67	
68	
69	
72	
73	

Tune Mode #1:	NG 1
Quick Scan	ON
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	13

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		OFF	7	Auto
68		OFF	7	Auto
69		OFF	7	Auto
71		OFF	7	Auto
72		OFF	7	Auto
73		OFF	7	Auto
82		OFF	7	Auto
83		OFF	7	Auto
135		OFF	7	Auto
137		OFF	7	Auto
143		OFF	7	Auto
145		OFF	7	Auto
165		OFF	7	Auto

Tune Mode #2:	NG 2
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	13

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		OFF	7	Auto
68		OFF	7	Auto
69		OFF	7	Auto
71		OFF	7	Auto
72		OFF	7	Auto
73		OFF	7	Auto
82		OFF	7	Auto
83		OFF	7	Auto
135		OFF	7	Auto
137		OFF	7	Auto

Acquisition Method

143	OFF	7	Auto
145	OFF	7	Auto
165	OFF	7	Auto

Tune Mode #3: NG 3
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 13

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		OFF	7	Auto
68		OFF	7	Auto
69		OFF	7	Auto
71		OFF	7	Auto
72		OFF	7	Auto
73		OFF	7	Auto
82		OFF	7	Auto
83		OFF	7	Auto
135		OFF	7	Auto
137		OFF	7	Auto
143		OFF	7	Auto
145		OFF	7	Auto
165		OFF	7	Auto

Tune Mode #4: NG 4
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 13

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		OFF	7	Auto
68		OFF	7	Auto
69		OFF	7	Auto
71		OFF	7	Auto
72		OFF	7	Auto
73		OFF	7	Auto
82		OFF	7	Auto
83		OFF	7	Auto
135		OFF	7	Auto
137		OFF	7	Auto
143		OFF	7	Auto
145		OFF	7	Auto
165		OFF	7	Auto

Tune Mode #5: NG 5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 13

Acquisition Method

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		OFF	7	Auto
68		OFF	7	Auto
69		OFF	7	Auto
71		OFF	7	Auto
72		OFF	7	Auto
73		OFF	7	Auto
82		OFF	7	Auto
83		OFF	7	Auto
135		OFF	7	Auto
137		OFF	7	Auto
143		OFF	7	Auto
145		OFF	7	Auto
165		OFF	7	Auto

Tune Mode #6:	NG 6
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	13

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		OFF	7	Auto
68		OFF	7	Auto
69		OFF	7	Auto
71		OFF	7	Auto
72		OFF	7	Auto
73		OFF	7	Auto
82		OFF	7	Auto
83		OFF	7	Auto
135		OFF	7	Auto
137		OFF	7	Auto
143		OFF	7	Auto
145		OFF	7	Auto
165		OFF	7	Auto

Tune Mode #7:	NG 7
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	13

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		OFF	7	Auto
68		OFF	7	Auto
69		OFF	7	Auto
71		OFF	7	Auto
72		OFF	7	Auto
73		OFF	7	Auto
82		OFF	7	Auto
83		OFF	7	Auto

Acquisition Method

135	OFF	7	Auto
137	OFF	7	Auto
143	OFF	7	Auto
145	OFF	7	Auto
165	OFF	7	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator) (Denominator)

67

68

69

72

73

[PERIPUMP/ISIS]

Sample Introduction General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump) 0.3 rps

Uptake Time 30 sec

Stabilize 40 sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump) 0.3 rps

Rinse at Rinse Port (Sample) 10 sec

Rinse at Rinse Port (Std) 10 sec

Post Run (Rinse)

Rinse Vial 1 1

Rinse Speed (Nebulizer Pump) 0.1 rps

Rinse at Rinse Vial (Step 1) 30 sec

Rinse at Rinse Port (Step 1) sec

Rinse Vial 2 2

Rinse Speed (Nebulizer Pump) 0.1 rps

Rinse at Rinse Vial (Step 2) 30 sec

Rinse at Rinse Port (Step 2) sec

Rinse Vial 3

Rinse Speed (Nebulizer Pump) rps

Rinse at Rinse Vial (Step 3) sec

Rinse at Rinse Port (Step 3) sec

Intelligent Rinse

Intelligent Rinse Off

Preemptive Rinse

Preemptive Rinse On

Start rinse before acquisition complete 0 sec

Move to the next rinse step at acquisition complete No

[TUNE]

Tune Way Custom Tune

Acquisition Method

Tune Mode #1:	NG 1	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #2:	NG 2	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

Acquisition Method

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #3:	NG 3	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #4:	NG 4	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

Acquisition Method

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #5:

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

Tune Mode #6:	NG 6	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #7:	NG 7	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Acquisition Method

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-8-17 Figure 3_STANDARD mode NG_Gd&Sm.b\001SMPL.d
 Acq Mode Spectrum
 Peak Pattern 20 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
73	
74	
77	
78	
149	

Tune Mode #1:	NG 1
Quick Scan	ON
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		OFF	7	Auto
74		OFF	7	Auto
75		OFF	7	Auto
77		OFF	7	Auto
78		OFF	7	Auto
79		OFF	7	Auto
147		OFF	7	Auto
149		OFF	7	Auto
155		OFF	7	Auto
157		OFF	7	Auto

Tune Mode #2:	Ng 2
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Standard
Number of Masses	10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		OFF	7	Auto
74		OFF	7	Auto
75		OFF	7	Auto
77		OFF	7	Auto
78		OFF	7	Auto
79		OFF	7	Auto
147		OFF	7	Auto

Acquisition Method

149	OFF	7	Auto
155	OFF	7	Auto
157	OFF	7	Auto

Tune Mode #3: NG 3
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		OFF	7	Auto
74		OFF	7	Auto
75		OFF	7	Auto
77		OFF	7	Auto
78		OFF	7	Auto
79		OFF	7	Auto
147		OFF	7	Auto
149		OFF	7	Auto
155		OFF	7	Auto
157		OFF	7	Auto

Tune Mode #4: NG 4
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		OFF	7	Auto
74		OFF	7	Auto
75		OFF	7	Auto
77		OFF	7	Auto
78		OFF	7	Auto
79		OFF	7	Auto
147		OFF	7	Auto
149		OFF	7	Auto
155		OFF	7	Auto
157		OFF	7	Auto

Tune Mode #5: NG 5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 10

Acquisition Method

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		OFF	7	Auto
74		OFF	7	Auto
75		OFF	7	Auto
77		OFF	7	Auto
78		OFF	7	Auto
79		OFF	7	Auto
147		OFF	7	Auto
149		OFF	7	Auto
155		OFF	7	Auto
157		OFF	7	Auto

Tune Mode #6: NG 6
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		OFF	7	Auto
74		OFF	7	Auto
75		OFF	7	Auto
77		OFF	7	Auto
78		OFF	7	Auto
79		OFF	7	Auto
147		OFF	7	Auto
149		OFF	7	Auto
155		OFF	7	Auto
157		OFF	7	Auto

Tune Mode #7: NG 7
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Standard
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		OFF	7	Auto
74		OFF	7	Auto
75		OFF	7	Auto
77		OFF	7	Auto
78		OFF	7	Auto
79		OFF	7	Auto
147		OFF	7	Auto
149		OFF	7	Auto

Acquisition Method

155	OFF	7	Auto
157	OFF	7	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)	(Denominator)
-------------	---------------

73

74

77

78

149

[PERIPUMP/ISIS]

Sample Introduction	General
---------------------	---------

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)	0.3	rps
-------------------------------	-----	-----

Uptake Time	30	sec
-------------	----	-----

Stabilize	40	sec
-----------	----	-----

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)	0.3	rps
------------------------------	-----	-----

Rinse at Rinse Port (Sample)	10	sec
------------------------------	----	-----

Rinse at Rinse Port (Std)	10	sec
---------------------------	----	-----

Post Run (Rinse)

Rinse Vial 1	1
--------------	---

Rinse Speed (Nebulizer Pump)	0.1	rps
------------------------------	-----	-----

Rinse at Rinse Vial (Step 1)	30	sec
------------------------------	----	-----

Rinse at Rinse Port (Step 1)		sec
------------------------------	--	-----

Rinse Vial 2	2
--------------	---

Rinse Speed (Nebulizer Pump)	0.1	rps
------------------------------	-----	-----

Rinse at Rinse Vial (Step 2)	30	sec
------------------------------	----	-----

Rinse at Rinse Port (Step 2)		sec
------------------------------	--	-----

Rinse Vial 3

Rinse Speed (Nebulizer Pump)		rps
------------------------------	--	-----

Rinse at Rinse Vial (Step 3)		sec
------------------------------	--	-----

Rinse at Rinse Port (Step 3)		sec
------------------------------	--	-----

Intelligent Rinse

Intelligent Rinse	Off
-------------------	-----

Preemptive Rinse

Preemptive Rinse	On
------------------	----

Start rinse before acquisition complete	0	sec
---	---	-----

Move to the next rinse step at acquisition complete	No
---	----

Acquisition Method

[TUNE]

Tune Way	Custom Tune	
Tune Mode #1:	NG 1	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #2:	Ng 2	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		

Acquisition Method

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #3:

NG 3

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%

Acquisition Method

OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #4:	NG 4	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #5:	NG 5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Acquisition Method

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #6:

NG 6

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%

Acquisition Method

OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
Tune Mode #7:	NG 7	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-8-17 Figure 3_Narrow mode NG_Nd Ba Ho.b\001SMPL.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass Element Name
 67
 68
 72

Tune Mode #1:

NG 1
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		ON	1	Auto
68		ON	1	Auto
71		ON	1	Auto
72		ON	1	Auto
82		ON	1	Auto
135		OFF	1	Auto
137		OFF	1	Auto
143		OFF	1	Auto
145		OFF	1	Auto
165		OFF	1	Auto

Tune Mode #2:

Copy NG 2
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		ON	1	Auto
68		ON	1	Auto
71		ON	1	Auto
72		ON	1	Auto
82		ON	1	Auto
135		OFF	1	Auto
137		OFF	1	Auto
143		OFF	1	Auto
145		OFF	1	Auto

Acquisition Method

165	OFF	1	Auto
-----	-----	---	------

Tune Mode #3:	Copy1 NG 3
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		ON	1	Auto
68		ON	1	Auto
71		ON	1	Auto
72		ON	1	Auto
82		ON	1	Auto
135		OFF	1	Auto
137		OFF	1	Auto
143		OFF	1	Auto
145		OFF	1	Auto
165		OFF	1	Auto

Tune Mode #4:	Copy NG 4
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		ON	1	Auto
68		ON	1	Auto
71		ON	1	Auto
72		ON	1	Auto
82		ON	1	Auto
135		OFF	1	Auto
137		OFF	1	Auto
143		OFF	1	Auto
145		OFF	1	Auto
165		OFF	1	Auto

Tune Mode #5:	Copy1 NG 5
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
------	--------------	--------	--------------------------	------------------

Acquisition Method

67	ON	1	Auto
68	ON	1	Auto
71	ON	1	Auto
72	ON	1	Auto
82	ON	1	Auto
135	OFF	1	Auto
137	OFF	1	Auto
143	OFF	1	Auto
145	OFF	1	Auto
165	OFF	1	Auto

Tune Mode #6: Copy NG 6
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		ON	1	Auto
68		ON	1	Auto
71		ON	1	Auto
72		ON	1	Auto
82		ON	1	Auto
135		OFF	1	Auto
137		OFF	1	Auto
143		OFF	1	Auto
145		OFF	1	Auto
165		OFF	1	Auto

Tune Mode #7: Copy1 NG 7
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 10

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
67		ON	1	Auto
68		ON	1	Auto
71		ON	1	Auto
72		ON	1	Auto
82		ON	1	Auto
135		OFF	1	Auto
137		OFF	1	Auto
143		OFF	1	Auto
145		OFF	1	Auto
165		OFF	1	Auto

Acquisition Method

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

67

68

72

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)

0.3

rps

Uptake Time

30

sec

Stabilize

40

sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)

0.3

rps

Rinse at Rinse Port (Sample)

10

sec

Rinse at Rinse Port (Std)

10

sec

Post Run (Rinse)

Rinse Vial 1

1

Rinse Speed (Nebulizer Pump)

0.1

rps

Rinse at Rinse Vial (Step 1)

30

sec

Rinse at Rinse Port (Step 1)

sec

Rinse Vial 2

2

Rinse Speed (Nebulizer Pump)

0.1

rps

Rinse at Rinse Vial (Step 2)

30

sec

Rinse at Rinse Port (Step 2)

sec

Rinse Vial 3

Rinse Speed (Nebulizer Pump)

rps

Rinse at Rinse Vial (Step 3)

sec

Rinse at Rinse Port (Step 3)

sec

Intelligent Rinse

Intelligent Rinse

Off

Preemptive Rinse

Preemptive Rinse

On

Start rinse before acquisition
complete

0

sec

Move to the next rinse step at
acquisition complete

No

[TUNE]

Tune Way

Custom Tune

Tune Mode #1:

NG 1

Acquisition Method

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2:	Copy NG 2	
---------------	-----------	--

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V

Acquisition Method

Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #3: Copy1 NG 3

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #4: Copy NG 4

Acquisition Method

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #5: Copy1 NG 5

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V

Acquisition Method

Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #6: Copy NG 6

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #7: Copy1 NG 7

Acquisition Method

(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\2-8-17 Figure 3_narrow mode NG_Gd&Sm.b\001SMPL.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
73	
74	
77	
78	
149	

Tune Mode #1:

NG 1
 Quick Scan ON
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 8

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		ON	1	Auto
74		ON	1	Auto
77		ON	1	Auto
78		ON	1	Auto
147		OFF	1	Auto
149		OFF	1	Auto
155		OFF	1	Auto
157		OFF	1	Auto

Tune Mode #2:

NG 2
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 8

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		ON	1	Auto
74		ON	1	Auto
77		ON	1	Auto
78		ON	1	Auto
147		OFF	1	Auto
149		OFF	1	Auto
155		OFF	1	Auto
157		OFF	1	Auto

Acquisition Method

Tune Mode #3: NG 3
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 8

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		ON	1	Auto
74		ON	1	Auto
77		ON	1	Auto
78		ON	1	Auto
147		OFF	1	Auto
149		OFF	1	Auto
155		OFF	1	Auto
157		OFF	1	Auto

Tune Mode #4: NG 4
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 8

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		ON	1	Auto
74		ON	1	Auto
77		ON	1	Auto
78		ON	1	Auto
147		OFF	1	Auto
149		OFF	1	Auto
155		OFF	1	Auto
157		OFF	1	Auto

Tune Mode #5: NG 5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 20 sec
 Resolution Narrow Peak
 Number of Masses 8

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		ON	1	Auto
74		ON	1	Auto
77		ON	1	Auto
78		ON	1	Auto
147		OFF	1	Auto
149		OFF	1	Auto

Acquisition Method

155	OFF	1	Auto
157	OFF	1	Auto

Tune Mode #6:	NG 6
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	8

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		ON	1	Auto
74		ON	1	Auto
77		ON	1	Auto
78		ON	1	Auto
147		OFF	1	Auto
149		OFF	1	Auto
155		OFF	1	Auto
157		OFF	1	Auto

Tune Mode #7:	NG 7
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	20 sec
Resolution	Narrow Peak
Number of Masses	8

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
73		ON	1	Auto
74		ON	1	Auto
77		ON	1	Auto
78		ON	1	Auto
147		OFF	1	Auto
149		OFF	1	Auto
155		OFF	1	Auto
157		OFF	1	Auto

[MONITOR]	
Monitor Mass	
Mass	
(Numerator)	(Denominator)
73	
74	
77	
78	
149	

[PERIPUMP/ISIS]	
Sample Introduction	General

Acquisition Method

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)	0.3	rps
Uptake Time	30	sec
Stabilize	40	sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)	0.3	rps
Rinse at Rinse Port (Sample)	10	sec
Rinse at Rinse Port (Std)	10	sec

Post Run (Rinse)

Rinse Vial 1	1	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 1)	30	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	2	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 2)	30	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec

Intelligent Rinse

Intelligent Rinse	Off
-------------------	-----

Preemptive Rinse

Preemptive Rinse	On	
Start rinse before acquisition complete	0	sec
Move to the next rinse step at acquisition complete	No	

[TUNE]

Tune Way	Custom Tune
----------	-------------

Tune Mode #1:

(Plasma)	NG 1	
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

Acquisition Method

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2:

NG 2

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min

Acquisition Method

3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
 Tune Mode #3:	 NG 3	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
 (Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
 (Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
 Tune Mode #4:	 NG 4	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

Acquisition Method

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #5:

NG 5

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min

Acquisition Method

3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
 Tune Mode #6:	 NG 6	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
 (Lenses)		
Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
 (Cell)		
Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V
 Tune Mode #7:	 NG 7	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

Acquisition Method

(Lenses)

Extract 1	0	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	10	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	No	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Supplementary Materials: Acquisition Methods for Figure 3B and Figure 6

Attached below is an example of the Acquisition Method for Deflect 5. There are also acquisition methods for Deflect 8, 11, 14, 17 and 20. But since only the deflect setting was modified these were not attached to save space.

Acquisition Method

[ACQ PARAMETERS]

Data Folder D:\Agilent\ICPMH\1\DATA\1-23-17 Oct -12_Def 5_ED 5 3 Samples.b\3BW91B.d
 Acq Mode Spectrum
 Peak Pattern 3 points
 Replicates 5
 Sweeps/Replicate 100

Monitored Masses:

Mass	Element Name
9	
51	
52	
53	
59	

Tune Mode #1:

Quick Scan	He 0
Independent P/A Factors	ON
Stabilization Time	OFF
Resolution	0 sec
Number of Masses	Narrow Peak
	55

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
80		OFF	0.3	Auto
82		ON	0.3	Auto
83		OFF	0.3	Auto
91		OFF	0.3	Auto
92		OFF	0.3	Auto
94		OFF	0.3	Auto
95		OFF	0.3	Auto
96		OFF	0.3	Auto
97		OFF	0.3	Auto
98		OFF	0.3	Auto
100		OFF	0.3	Auto

Acquisition Method

101	OFF	0.3	Auto
105	OFF	0.3	Auto
106	OFF	0.3	Auto
108	OFF	0.3	Auto
111	OFF	0.3	Auto
115	OFF	0.3	Auto
116	OFF	0.3	Auto
118	OFF	0.3	Auto
137	OFF	0.3	Auto
140	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
152	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #2: 1
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 55

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75		OFF	0.3	Auto

Acquisition Method

76	OFF	0.3	Auto
77	ON	0.3	Auto
78	ON	0.3	Auto
80	OFF	0.3	Auto
82	ON	0.3	Auto
83	OFF	0.3	Auto
91	OFF	0.3	Auto
92	OFF	0.3	Auto
94	OFF	0.3	Auto
95	OFF	0.3	Auto
96	OFF	0.3	Auto
97	OFF	0.3	Auto
98	OFF	0.3	Auto
100	OFF	0.3	Auto
101	OFF	0.3	Auto
105	OFF	0.3	Auto
106	OFF	0.3	Auto
108	OFF	0.3	Auto
111	OFF	0.3	Auto
115	OFF	0.3	Auto
116	OFF	0.3	Auto
118	OFF	0.3	Auto
137	OFF	0.3	Auto
140	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
152	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #3:	2
Quick Scan	OFF
Independent P/A Factors	OFF
Stabilization Time	0 sec
Resolution	Narrow Peak
Number of Masses	55

Acquisition Method

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
80		OFF	0.3	Auto
82		ON	0.3	Auto
83		OFF	0.3	Auto
91		OFF	0.3	Auto
92		OFF	0.3	Auto
94		OFF	0.3	Auto
95		OFF	0.3	Auto
96		OFF	0.3	Auto
97		OFF	0.3	Auto
98		OFF	0.3	Auto
100		OFF	0.3	Auto
101		OFF	0.3	Auto
105		OFF	0.3	Auto
106		OFF	0.3	Auto
108		OFF	0.3	Auto
111		OFF	0.3	Auto
115		OFF	0.3	Auto
116		OFF	0.3	Auto
118		OFF	0.3	Auto
137		OFF	0.3	Auto
140		OFF	0.3	Auto
142		OFF	0.3	Auto
143		OFF	0.3	Auto
144		OFF	0.3	Auto
145		OFF	0.3	Auto
146		OFF	0.3	Auto
147		OFF	0.3	Auto
148		OFF	0.3	Auto
149		OFF	0.3	Auto
150		OFF	0.3	Auto
152		OFF	0.3	Auto
155		OFF	0.3	Auto

Acquisition Method

156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #4: 2.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 55

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
80		OFF	0.3	Auto
82		ON	0.3	Auto
83		OFF	0.3	Auto
91		OFF	0.3	Auto
92		OFF	0.3	Auto
94		OFF	0.3	Auto
95		OFF	0.3	Auto
96		OFF	0.3	Auto
97		OFF	0.3	Auto
98		OFF	0.3	Auto
100		OFF	0.3	Auto
101		OFF	0.3	Auto
105		OFF	0.3	Auto
106		OFF	0.3	Auto
108		OFF	0.3	Auto
111		OFF	0.3	Auto
115		OFF	0.3	Auto
116		OFF	0.3	Auto

Acquisition Method

118	OFF	0.3	Auto
137	OFF	0.3	Auto
140	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
152	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #5: 3
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 55

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
80		OFF	0.3	Auto
82		ON	0.3	Auto
83		OFF	0.3	Auto
91		OFF	0.3	Auto

Acquisition Method

92	OFF	0.3	Auto
94	OFF	0.3	Auto
95	OFF	0.3	Auto
96	OFF	0.3	Auto
97	OFF	0.3	Auto
98	OFF	0.3	Auto
100	OFF	0.3	Auto
101	OFF	0.3	Auto
105	OFF	0.3	Auto
106	OFF	0.3	Auto
108	OFF	0.3	Auto
111	OFF	0.3	Auto
115	OFF	0.3	Auto
116	OFF	0.3	Auto
118	OFF	0.3	Auto
137	OFF	0.3	Auto
140	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
152	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #6: 3.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 55

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto

Acquisition Method

69	OFF	0.3	Auto
70	OFF	0.3	Auto
71	ON	0.3	Auto
72	ON	0.3	Auto
73	OFF	0.3	Auto
74	OFF	0.3	Auto
75	OFF	0.3	Auto
76	OFF	0.3	Auto
77	ON	0.3	Auto
78	ON	0.3	Auto
80	OFF	0.3	Auto
82	ON	0.3	Auto
83	OFF	0.3	Auto
91	OFF	0.3	Auto
92	OFF	0.3	Auto
94	OFF	0.3	Auto
95	OFF	0.3	Auto
96	OFF	0.3	Auto
97	OFF	0.3	Auto
98	OFF	0.3	Auto
100	OFF	0.3	Auto
101	OFF	0.3	Auto
105	OFF	0.3	Auto
106	OFF	0.3	Auto
108	OFF	0.3	Auto
111	OFF	0.3	Auto
115	OFF	0.3	Auto
116	OFF	0.3	Auto
118	OFF	0.3	Auto
137	OFF	0.3	Auto
140	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
152	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #7:

4

Acquisition Method

Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 55

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
80		OFF	0.3	Auto
82		ON	0.3	Auto
83		OFF	0.3	Auto
91		OFF	0.3	Auto
92		OFF	0.3	Auto
94		OFF	0.3	Auto
95		OFF	0.3	Auto
96		OFF	0.3	Auto
97		OFF	0.3	Auto
98		OFF	0.3	Auto
100		OFF	0.3	Auto
101		OFF	0.3	Auto
105		OFF	0.3	Auto
106		OFF	0.3	Auto
108		OFF	0.3	Auto
111		OFF	0.3	Auto
115		OFF	0.3	Auto
116		OFF	0.3	Auto
118		OFF	0.3	Auto
137		OFF	0.3	Auto
140		OFF	0.3	Auto
142		OFF	0.3	Auto
143		OFF	0.3	Auto
144		OFF	0.3	Auto
145		OFF	0.3	Auto
146		OFF	0.3	Auto
147		OFF	0.3	Auto

Acquisition Method

148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
152	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

Tune Mode #8: 4.5
 Quick Scan OFF
 Independent P/A Factors OFF
 Stabilization Time 0 sec
 Resolution Narrow Peak
 Number of Masses 55

Mass	Element Name	+0.5 u	IntegTime/ Mass [sec]	Detector Mode
9		OFF	0.3	Auto
51		OFF	0.3	Auto
52		OFF	0.3	Auto
53		OFF	0.3	Auto
59		OFF	0.3	Auto
66		OFF	0.3	Auto
69		OFF	0.3	Auto
70		OFF	0.3	Auto
71		ON	0.3	Auto
72		ON	0.3	Auto
73		OFF	0.3	Auto
74		OFF	0.3	Auto
75		OFF	0.3	Auto
76		OFF	0.3	Auto
77		ON	0.3	Auto
78		ON	0.3	Auto
80		OFF	0.3	Auto
82		ON	0.3	Auto
83		OFF	0.3	Auto
91		OFF	0.3	Auto
92		OFF	0.3	Auto
94		OFF	0.3	Auto
95		OFF	0.3	Auto
96		OFF	0.3	Auto
97		OFF	0.3	Auto
98		OFF	0.3	Auto
100		OFF	0.3	Auto
101		OFF	0.3	Auto
105		OFF	0.3	Auto

Acquisition Method

106	OFF	0.3	Auto
108	OFF	0.3	Auto
111	OFF	0.3	Auto
115	OFF	0.3	Auto
116	OFF	0.3	Auto
118	OFF	0.3	Auto
137	OFF	0.3	Auto
140	OFF	0.3	Auto
142	OFF	0.3	Auto
143	OFF	0.3	Auto
144	OFF	0.3	Auto
145	OFF	0.3	Auto
146	OFF	0.3	Auto
147	OFF	0.3	Auto
148	OFF	0.3	Auto
149	OFF	0.3	Auto
150	OFF	0.3	Auto
152	OFF	0.3	Auto
155	OFF	0.3	Auto
156	OFF	0.3	Auto
157	OFF	0.3	Auto
161	OFF	0.3	Auto
163	OFF	0.3	Auto
165	OFF	0.3	Auto
203	OFF	0.3	Auto
205	OFF	0.3	Auto

[MONITOR]

Monitor Mass

Mass

(Numerator)

(Denominator)

9

51

52

53

59

[PERIPUMP/ISIS]

Sample Introduction

General

PeriPump/ISIS Settings

Pre Run

Uptake Speed (Nebulizer Pump)

0.3

rps

Uptake Time

30

sec

Stabilize

40

sec

Post Run (Probe Rinse)

Rinse Speed (Nebulizer Pump)

0.1

rps

Rinse at Rinse Port (Sample)

10

sec

Rinse at Rinse Port (Std)

10

sec

Acquisition Method

Post Run (Rinse)		
Rinse Vial 1	2	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 1)	30	sec
Rinse at Rinse Port (Step 1)		sec
Rinse Vial 2	1	
Rinse Speed (Nebulizer Pump)	0.1	rps
Rinse at Rinse Vial (Step 2)	30	sec
Rinse at Rinse Port (Step 2)		sec
Rinse Vial 3		
Rinse Speed (Nebulizer Pump)		rps
Rinse at Rinse Vial (Step 3)		sec
Rinse at Rinse Port (Step 3)		sec
Intelligent Rinse		
Intelligent Rinse	Off	
Preemptive Rinse		
Preemptive Rinse	On	
Start rinse before acquisition complete	0	sec
Move to the next rinse step at acquisition complete	No	
[TUNE]		
Tune Way	Custom Tune	
Tune Mode #1:		
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min
(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V
(Cell)		

Acquisition Method

Use Gas	Yes	
He Flow	On	
He Flow Rate	0	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #2:	1	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	1	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #3:	2	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min

Acquisition Method

Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	2	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #4:	2.5	
---------------	-----	--

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Acquisition Method

Use Gas	Yes	
He Flow	On	
He Flow Rate	2.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #5:	3	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	3	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #6:	3.5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min

Acquisition Method

Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Use Gas	Yes	
He Flow	On	
He Flow Rate	3.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #7:

(Plasma)

RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)

Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)

Acquisition Method

Use Gas	Yes	
He Flow	On	
He Flow Rate	4	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V

Tune Mode #8:	4.5	
(Plasma)		
RF Power	1550	W
RF Matching	1.4	V
Smpl Depth	8	mm
Carrier Gas	0.84	l/min
Option Gas	0	%
Nebulizer Pump	0.1	rps
S/C Temp	2	°C
Gas Switch	Makeup Gas	
Makeup/Dilution Gas	0	l/min

(Lenses)		
Extract 1	-10	V
Extract 2	-160	V
Omega Bias	-80	V
Omega Lens	9.5	V
Cell Entrance	-30	V
Cell Exit	-75	V
Deflect	5	V
Plate Bias	-50	V

(Cell)		
Use Gas	Yes	
He Flow	On	
He Flow Rate	4.5	ml/min
H2 Flow	Off	
H2 Flow Rate	0	ml/min
3rd Gas Flow	Off	
3rd Gas Flow Rate	0	%
OctP Bias	-12	V
OctP RF	190	V
Energy Discrimination	5	V