Supplementary Information

Table S1. ICP-MS operating parameters used by L1.

Parameter	Thermo iCAPQ
HF generator	27 MHz
RF power	1550 W
Argon plasma flow rate	15 L min^{-1}
Argon auxiliary flow rate	0.65 L min^{-1}
Argon nebulisation flow rate	1.1 L min^{-1}
Nebulizer type and flow rate	Centric glass nebuizer
Spray chamber temperature	3°C
Quartz torch with guard electrode	Injector 2.5 mm
Sampler cone	Ni 1.1 mm
Skimmer cone	Ni 0.5 mm
High voltage interface	-
Extraction lens	-
Focus lens (STD, KED)	+20 V, -8 V
Collision cell	Qcell KED
CCT bias (STD, KED)	-2 V, -21V
Pole bias (STD, KED)	-1 V, -18 V
D1 lens (STD, KED)	-196 V, -350 V
D2 lens (STD, KED)	-80 V, -158 V
Detector dead time	40 ns
Isotope monitored	^{6}Li, ^{7}Li, ^{103}Rh, ^{104}Pd, ^{105}Pd, ^{106}Pd, ^{108}Pd, ^{139}La, ^{181}Ta, ^{194}Pt, ^{195}Pt, ^{196}Pt, ^{197}Au

Table S2. ICP-MS operating parameters used by L2 with AGILENT 8900 TQ ICP-MS.

Parameter	Single MS	MS/MS (He)	MS/MS (O_2)
Used Cell Gases	None	He	O_2
Nebulizer	MicroMist	MicroMist	MicroMist
Cell gas flow	None	5 mL L^{-1}	20 %
Spraychamber Temperature	2°C	2°C	2°C
Interface cones	Nickel	Nickel	Nickel
RF Power	1550 W	1550 W	1550 W
RF Matching	1.30 V	1.30 V	1.30 V
Nebulizer flow rate	1.09 L min^{-1}	1.09 L min^{-1}	1.09 L min^{-1}
Makeup gas flow rate	0.0 L min^{-1}	0.0 L min^{-1}	0.0 L min^{-1}
Integration time	0.1 sec	0.1 sec	0.1 sec
Extract lens 1	-9.4 V	-9.4 V	-9.4V
Extract lens 2	-250 V	-250 V	-250 V
Omega bias	-140 V	-140 V	-140V
Omega lens	8.6 V	8.6 V	8.6 V
Q1 entrance	-50 V	-50 V	-50 V
Q1 exit	1 V	1 V	1 V
Cell focus	-3 V	-3 V	-3 V
Cell entrance	-40 V	-50 V	-50 V

Cell exit	-50 V	-60 V	-60 V
Deflect	13.6 V	-4.8 V	4.2 V
Plate bias	-50 V	-60 V	-60 V
OctP bias	-8.0 V	-18.0 V	-5.0 V
OctP RF	110 V	180 V	180 V
Energy discrimination	5.0 V	3.0 V	-7.0 V

Table S3. ICP-MS operating parameters used by L3 with Agilent 8000.

Parameter	Single MS	Single MS (He)	MS/MS (N_2O)	MS/MS H2	MS/MSH2 HMI
Used Cell Gases	None	He	N_2O	H_2	H_2
Nebulizer	Self-aspirating MicroFlow	Self-aspirating MicroFlow	Self-aspirating MicroFlow	Self-aspirating MicroFlow	Self-aspirating MicroFlow
Cell gas flow	None	4.5 mL L^{-1}	20%	6.0 mL min^{-1}	6.0 mL min^{-1}
Spraychamber Temperature	2 C	2 C	2°C	2°C	2°C
Interface cones	Nickel	Nickel	Nickel	Nickel	Nickel
RF Power	1550 W	1550 W	1550 W	1550 W	1600 W
RF Matching	1.80 V	1.80 V	1.80 V	1.80 V	1.80 V
Nebulizer flow rate	1.07 L min^{-1}	1.05 L min^{-1}	1.05 L min^{-1}	1.05 L min^{-1}	0.28 L min^{-1}
Makeup gas flow rate	0.10 L min^{-1}	0.10 L min^{-1}	0.10 L min^{-1}	0.10 L min^{-1}	0.71 L min^{-1}
Integration time	0.1 sec	0.1 sec	0.1 sec	0.1 sec	0.1 sec
Extract lens 1	0.0 V	-2.5 V	-9.5 V	0.0 V	0.0 V
Extract lens 2	-165 V	-190.0 V	-200.0 V	-175.0 V	-200 V
Omega bias	-95 V	-90 V	-100 V	-100 V	-100 V
Omega lens	10.0 V	9.6 V	10.7 V	10.9 V	11.3 V
Q1 entrance	-6 V	0 V	-3 V	2 V	0 V
Q1 exit	-3 V	0 V	2 V	-3 V	-3 V
Cell focus	4.0 V	1.0 V	5.0 V	3.0 V	3.0 V
Cell entrance	-40 V	-50 V	-40 V	-50 V	-50 V
Cell exit	-50 V	-60 V	-51 V	-60 V	-60 V
Deflect	13.6 V	-4.2 V	7.6 V	-4.0 V	-4.4 V
Plate bias	-50 V	-60 V	-50 V	-60 V	-60 V
OctP bias	-8.0 V	-20.0 V	-0.5 V	-18.0 V	-18.0 V
OctP RF	130 V	190 V	170 V	160 V	170 V
Energy discrimination	5.0 V	5.0 V	-5.0 V	0.0 V	0.0 V

Table S4. ICP-MS operating parameters used by L4.

Parameter	Thermo Element XR	Thermo iCAPQ
HF generator	27 MHz	27 MHz
RF power	1300 W	1550 W
Argon plasma flow rate	16 L min^{-1}	14 L min^{-1}
Argon auxiliary flow rate	0.8 L min^{-1}	0.8 L min^{-1}
Argon nebulisation flow rate	1 L min^{-1}	1 L min^{-1}
Nebulizer Seaspray flow rate	400 µL min^{-1}	400 µL min^{-1}
Spray chamber temperature	3 °C	3 °C
Quartz torch with guard electrode	Injector 1.2 mm	Injector 2.5 mm

Sampler cone	Nickel 1.1 mm	Nickel 1.1 mm
Skimmer cone	Nickel 0.8 mm	Nickel 0.5 mm
High voltage interface	8000 V	-
Extraction lens	-2000 V	-
Focus lens (STD, KED)	-1000 V	+20 V, -8 V
Variable mass resolution	LR ≈ 300, MR ≈ 4000, HR ≈ 10000	-
Collision cell	-	Qcell KED
CCT bias (STD, KED)	-	-2 V, -21V
Pole bias (STD, KED)	-	-1 V, -18 V
D1 lens (STD, KED)	-	-196 V, -350 V
D2 lens (STD, KED)	-	-80 V, -158 V
Detector dead time	9 ns	40 ns
Isotope monitored	^{6}Li, ^{7}Li, ^{103}Rh, ^{104}Pd, ^{105}Pd, ^{106}Pd, ^{108}Pd, ^{139}La, ^{181}Ta, ^{194}Pt, ^{195}Pt, ^{196}Pt, ^{197}Au	^{6}Li, ^{7}Li, ^{103}Rh, ^{104}Pd, ^{105}Pd, ^{106}Pd, ^{108}Pd, ^{139}La, ^{181}Ta, ^{194}Pt, ^{195}Pt, ^{196}Pt, ^{197}Au

Table S5. ICP-MS/MS operating parameters used by L5 with NexION 5000. Measured isotopes for N_2O DRC mode specify if they were measured on-mass (OM) or mass-shifted (MS)

Parameter	Standard Mode	N_2O DRC Mode
Scan mode	MS/MS	MS/MS
Cell gas	None	N_2O (0.5 mL min^{-1})
RPq	0.25	0.45
Sample introduction	Self-aspiration	Self-aspiration
Nebulizer	PFA MicroFlow	PFA MicroFlow
Spray chamber	Peltier cooled SilQ cyclonic spray chamber	Peltier cooled SilQ cyclonic spray chamber
Spray chamber temperature	5 °C	5 °C
Interface cones	Nickel	Nickel
RF power	1600 W	1600 W
Ar nebulizer gas flow	1.00 L min^{-1}	1.00 L min^{-1}
Ar auxiliary gas flow	1.2 L min^{-1}	1.2 L min^{-1}
Ar plasma gas flow	16 L min^{-1}	16 L min^{-1}
Dwell time	50 ms	50 ms
Measured isotopes	^{59}Co, ^{195}Pt, ^{194}Pt	^{71}Ga (OM), ^{72}Ge (MS: +16), ^{74}Ge (MS: +16), ^{105}Pd (MS: +16), ^{139}La (MS: +16), ^{141}Pr (MS: +16), ^{143}Nd (MS: +16), ^{145}Nd (MS: +16), ^{157}Gd (MS: +16), ^{160}Gd (MS: +16), ^{161}Dy (MS: +16), ^{163}Dy (MS: +16), ^{181}Ta (MS: +32), ^{197}Au (OM)

Table S6. ICP-MS operating parameters used by L6.

Parameter	Thermo Element XR
HF generator	27 MHz
RF power	1160 W
Argon plasma flow rate	16 L min^{-1}
Argon auxiliary flow rate	0.9 L min^{-1}
Argon nebulisation flow rate	1.1 L min^{-1}

Nebulizer type and flow rate	Microflow PFA, 100 µL/min
Spray chamber type	cyclonic quartz
Spray chamber temperature	room temperature
Quartz torch with guard electrode	injector sapphire 1.5 mm
Sampler cone	nickel 0.8 mm
Skimmer cone	nickel 0.8 mm
High voltage interface	8000 V
Extraction lens	-2000 V
Focus lens (STD, KED)	-1078 V
Variable mass resolution adjusted at	LR ($M/\Delta M \approx 300$)
Detector dead time	50 ns
Isotopes/isotope ratios monitored	^{7}Li/^{89}Y, ^{59}Co/^{121}Sb, ^{139}La/^{137}Ba
Autosample	Elemental Scientific, Inc., SC-E2DXS

Table S7. ICP-MS operating parameters used by L7.

Parameter	Agilent 8800 QQQ		Thermo ELEMENT 2
RF power	1550 W		1300 W
RF matching	1.80 V		-
Argon plasma flow rate	-		15 L min^{-1}
Argon auxiliary flow rate	-		0.8 L min^{-1}
Argon nebulisation flow rate	1.15 L min^{-1}		1.079 L min^{-1}
Nebulizer type	PFA MicroFlow		Duramist PEEK
Spray chamber	Scott Type PFA		Cyclonic PFA
Spray chamber temperature	2 °C		-
Interface cones	Nickel		Nickel (Sampler 1.1 mm, Skimmer 0.8 mm)
Nebulizer pump rate	0.2 rps		20 rpm
Integration time	0.2 s		0.05 s
Extraction lens 1	-55.0 V		-2000 V
Extraction lens 2	-115.0 V		-
Omega bias	-65 V		-
Omega lens	8.8 V		-
Q1 entrance	1 V		-
Q1 exit	0 V		-
Cell focus / Focus lens	-1.0 V		-
Cell entrance	-40 V		-800 V
Cell exit	-56 V		-
Deflect	12 V		-
Plate bias	-45 V		-
Instrument Mode	MS/MS	MS/MS	Medium Resolution (MR) (R ≈ 4000)
Used cell gases	None	H_2	-
Cell gas flow	-	2 mL min^{-1}	-
OctP bias	-10.0 V	-9.5 V	-
OctP RF	120 V	130 V	-
Energy discrimination	9.0 V	6.0 V	-
Isotope monitored	^{139}La, ^{105}Pd, ^{106}Pd, ^{108}Pd, ^{194}Pt, ^{196}Pt, ^{147}Sm, ^{149}Sm	^{41}Pr, ^{145}Nd, ^{146}Nd, ^{161}Dy, ^{163}Dy, ^{197}Au	^{6}Li, ^{7}Li, ^{71}Ga

Table S8. ICP-MS operating parameters used by L8 with Thermo iCAP TQ ICP-MS.

Parameter	Single MS (He)	MS/MS (He) Normal flow	MS/MS (He) High flow	MS/MS (O_2)
Measuring mode	SQ-KED	TQ-He	TQ-iHe	TQ-O2
Used Cell Gases	He	He	He	O_2
Nebulizer	Self-aspirating PF-STA	Self-aspirating PF-STA	Self-aspirating PF-STA	Self-aspirating PF-STA
Cell gas flow	4.5 mL L^{-1}	4.5 mL L^{-1}	6.0 mL L^{-1}	0.30 mL L^{-1}
Spraychamber temperature	2.70°C	2.70°C	2.70 C	2.70°C
Interface cones	Nickel	Nickel	Nickel	Nickel
RF Power	1550 W	1550 W	1550 W	1550 W
Nebulizer flow rate*	0.76 L min^{-1}	0.76 L min^{-1}	0.76 L min^{-1}	0.76 L min^{-1}
Additional gas flow rate	0.20 L min^{-1}	0.20 L min^{-1}	0.20 L min^{-1}	0.20 L min^{-1}
Extraction Lens 2*	-120 V	-120 V	-120 V	-120 V
Q1 Focus Lens*	1.30 V	1.30 V	1.30 V	1.30 V
D1 Lens	-350 V	-350 V	-350 V	-350 V
D2 Lens*	-155 V	-155 V	-155 V	-155 V
Pole Bias	-18 V	-18 V	-18 V	-12 V
CR Bias	-21 V	-21 V	-21 V	-6.50 V
Focus Lens	1.00 V	0.00 V	0.00 V	-7.50 V
Pole Bias Q1	2.00 V	2.00 V	2.00 V	-2.52 V
Detector dead time	40 ns	40 ns	40 ns	40 ns
**Typical value*				
Measured isotopes	^{45}Sc (I.S.)	^{45}Sc (I.S.)	^{45}Sc (I.S.)	^{45}Sc (I.S.)
	^{73}Ge (I.S.)	^{103}Rh (I.S.)	^{103}Rh (I.S.)	^{103}Rh (I.S.)
	^{103}Rh (I.S.)	^{193}Ir (I.S.)	^{193}Ir (I.S.)	^{193}Ir (I.S.)
	^{193}Ir (I.S.)	^{55}Mn (I.S.)	^{63}Cu	^{137}Ba^{16}O (I.S.)
	^{105}Pd	^{59}Co	^{65}Cu	^{206}Pb^{16}O (I.S.)
	^{106}Pd	^{60}Ni		^{71}Ga
	^{108}Pd	^{62}Ni		^{139}La^{16}O
	^{194}Pt			^{141}Pr^{16}O
	^{195}Pt			^{143}Nd^{16}O
				^{145}Nd^{16}O
				^{155}Gd^{16}O
				^{157}Gd^{16}O
				^{161}Dy^{16}O
				^{163}Dy^{16}O
				^{197}Au