

SPECTRASCAN

ELEMENTAL STANDARDS
FOR ATOMIC SPECTROSCOPY



SPECTRASCAN STANDARDS

For more than 20 years Spectrascan has produced elemental standards with great success. The market for standards is growing and the introduction of new techniques increases the demand for accurate and ultra pure standards. Spectrascan products are among the best standards available for this purpose. In order to meet the increasing demand for quality, Spectrascan is now in the position to offer products according to the three most important certifications for manufacturers of analytical standards:

ISO:9001:2000

Certifies that the production has official written procedures and training documentation in the areas of manufacturing, analysis, certification and packaging.

ISO 17025:1999

Certifies that the quality-oriented tests are performed correctly which establishes that Spectrascan standards indeed are quality products. To be ISO 17025 certified Spectrascan must not only be consistent, but must also be proficient in testing the quality of the standards.

ISO Guide 34:2000

Guide 34 provides the highest level of quality assurance, stating that the Spectrascan standards are produced correctly and competently. All methods used to certify the Spectrascan standards must be validated and proven to be accurate. The accreditation also requires that an uncertainty be reported on the certificate of analysis. This uncertainty must include all of the sources of error involved in the certification process. The Certificate of Analysis must itself observe stricter requirements imposed by the ISO committee.

It should also be noted that ISO Guide 34 requires compliance with:

- ISO Guide 30:1992 – Terms and definitions used in connection with Reference Materials
- ISO Guide 31:1981 – Contents of Certificates of Reference Materials
- ISO Guide 35:1989 – Certification of Reference Materials – General and statistical principles.

Certificates

As a result of Spectrascan's ISO certifications the new 4-page Certificate of Analysis is much more comprehensive than previously. The certificate now also includes: Description of starting material, certified value included uncertainty determined by two independent methods, traceability documentation and trace metallic impurities.

Expiration Date

Expiration date is the recommended amount of time that a standard should remain in use in a laboratory setting after it has been opened. Expiration dates of the trace metals standard are dependent upon three factors:

- Chemical stability of the standard
- Transpiration losses of the standard
- Human error while using the standard

As a result of these three factors, the standard can not be guaranteed after a period of one year nor can the expiration date be arbitrarily extended. To do so implies that Spectrascan as a manufacturer take legal responsibility for a customer's inaccurate result during that past year. In addition, most federal and state regulatory agencies recommend not more than 1 year and for these reasons we have changed the expiration date. All Spectrascan standards listed in this catalogue have one year expiration date, clearly indicated on each bottle and certificate.

Numerical system for the products

With this new catalogue comes also a new numerical system for all solutions. This is a result of adding new products to the existing line of standards.

- 1 1 1 2 The first number/s indicating concentration 1.. for 1000µg/ml or 10.. .. for 10000µg/ml
- 1 1 1 2 The second number indicating volume 1.. for 125ml, 2.. for 250 ml or 5..for 500ml
- 1 1 1 2 The two final numbers indicating the existing element as historically used for Spectrascan standards.

SINGLE-ELEMENT STANDARDS

4-18

Spectrascan single-element standards are designed to meet the requirements of ICP-AES, ICP-MS, IC as well as atomic absorption methods. In this new catalogue more elements, concentrations levels and alternative matrices have been added.

MULTI-ELEMENT STANDARDS

19-22

Preparing your own multi-element standards is both time-consuming and expensive. To help you being more efficient Spectrascan produces a wide selection of high purity multi-element standards. The standards are produced from the same high purity source materials as the single-element standards. In this catalogue we have added new solutions and listed all blends after concentration.

ION CHROMATOGRAPHY STANDARDS

23-27

In order to meet the increasing demand for quality Spectrascan has greatly extended the range of standards for Ion Chromatography. The standards are produced from the same high purity source materials as the single- and multielement standards.

ATOMIC ABSORPTION REAGENTS

28

Spectrascan offers a range of products intended to improve instrument performance. Matrix Modifiers which allow the optimization of analytical conditions to provide better GFAA instrument response and better detection limits. Releasing agents which eliminates the chemical interference from ligands that complex with the analyte thereby altering the free atom population in the same. Ionization buffers which will increase the free-electron concentration, helping to stabilize the amount of ionization in samples.

STABLE ISOTOPE STANDARDS SOLUTIONS

29-31

Spectrascan enriched isotope solutions provide analysts with an inexpensive source of standards to be used as internal standards or in isotope dilution analysis. All standards contain 100 ml of a single enriched isotope. The standards have been analysed for both isotopic content and impurities.

CUSTOM BLENDED STANDARDS

32-33

In addition to the standards listed in this catalogue, we are happy to produce custom blended standards. Please contact us or our nearest distributor for more details.

SINGLE-ELEMENT STANDARDS

GENERAL PROPERTIES

ELEMENT SOURCES:	Highest purity starting materials available
WATER:	18 megaohm
BOTTLES:	LDPE (Low Density Polyethylene)
EXPIRATION DATE:	1 year from date of shipping
ACIDS:	Purified Acids
STORAGE RECOMMENDATION:	Room temperature

Ag

SILVER

SOURCE: Ag metal
PURITY: ≥ 99.998%

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
10	3.5% HNO ₃	125	110
100	3.5% HNO ₃	125	0110
1000	3.5% HNO ₃	125	1110
1000	3.5% HNO ₃	250	1210
1000	3.5% HNO ₃	500	1510
10000	5% HNO ₃	125	10110
10000	5% HNO ₃	250	10210

Al

ALUMINIUM

SOURCE: Al metal
PURITY: ≥ 99.997%

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
10	1.4% HNO ₃	125	112
100	1.4% HNO ₃	125	0112
1000	2% HNO ₃	125	1112
1000	2% HNO ₃	250	1212
1000	2% HNO ₃	500	1512
10000	5% HNO ₃	125	10112
10000	5% HNO ₃	250	10212
1000	2% HCl	125	1112C
1000	2% HCl	250	1212C
1000	2% HCl	500	1512C

As**ARSENIC**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: As metal	10	1.4% HNO ₃	125	113
PURITY: ≥ 99.999%	100	1.4% HNO ₃	125	0113
	1000	1.4% HNO ₃	125	1113
	1000	1.4% HNO ₃	250	1213
	1000	1.4% HNO ₃	500	1513
	10000	1.4% HNO ₃	125	10113
	10000	1.4% HNO ₃	250	10213

Au**GOLD**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: HAuCl ₄ ·xH ₂ O	10	3.3% HCl	125	118
PURITY: ≥ 99.997%	100	3.3% HCl	125	0118
	1000	3.3% HCl	125	1118
	1000	3.3% HCl	250	1218
	1000	3.3% HCl	500	1518
	10000	3.3% HCl	125	10118
	10000	3.3% HCl	250	10218
	1000	1.4% HNO ₃	125	1118N
	1000	1.4% HNO ₃	250	1218N

B**BORON**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: H ₂ BO ₃	1000	H ₂ O	125	1115
PURITY: ≥ 99.999%	1000	H ₂ O	250	1215
	1000	H ₂ O	500	1515
	10000	1.5% NH ₄ OH	125	10115
	10000	1.5% NH ₄ OH	250	10215

Ba**BARIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Ba(NO ₃) ₂	10	0.07% HNO ₃	125	116
PURITY: ≥ 99.99%	100	0.1% HNO ₃	125	0116
	1000	0.1% HNO ₃	125	1116
	1000	0.1% HNO ₃	250	1216
	1000	0.1% HNO ₃	500	1516
	10000	1.4% HNO ₃	125	10116
	10000	1.4% HNO ₃	250	10216

Be**BERYLLIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Be(OOCCH ₃) ₂	10	2% HNO ₃	125	119
PURITY: ≥ 99.999%	100	2% HNO ₃	125	0119
	1000	2% HNO ₃	125	1119
	1000	2% HNO ₃	250	1219
	1000	2% HNO ₃	500	1519
	10000	4% HNO ₃	125	10119
	10000	4% HNO ₃	250	10219

Bi**BISMUTH**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Bi metal	10	3.5% HNO ₃	125	120
PURITY: ≥ 99.999%	100	3.5% HNO ₃	125	0120
	1000	3.5% HNO ₃	125	1120
	1000	3.5% HNO ₃	250	1220
	1000	3.5% HNO ₃	500	1520
	10000	3.5% HNO ₃	125	10120
	10000	3.5% HNO ₃	250	10220

Br**BROMIDE**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: NH ₄ Br	1000	H ₂ O	125	1176
PURITY: ≥ 99.998%	1000	H ₂ O	250	1276
	1000	H ₂ O	500	1576

C**CARBON**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Tartaric Acid	1000	0.14% HNO ₃	125	1109
PURITY: ≥ 99.995%	1000	0.14% HNO ₃	250	1209
	1000	0.14% HNO ₃	500	1509
	10000	1.4% HNO ₃	125	10109
	10000	1.4% HNO ₃	250	10209

Ca**CALCIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: CaO	10	0.07% HNO ₃	125	106
PURITY: ≥ 99.999%	100	0.07% HNO ₃	125	0106
	1000	0.07% HNO ₃	125	1106
	1000	0.07% HNO ₃	250	1206
	1000	0.07% HNO ₃	500	1506
	10000	1.4% HNO ₃	125	10106
	10000	1.4% HNO ₃	250	10206

Cd**CADMIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Cd metal	10	2% HNO ₃	125	114
PURITY: ≥ 99.998%	100	2% HNO ₃	125	0114
	1000	2% HNO ₃	125	1114
	1000	2% HNO ₃	250	1214
	1000	2% HNO ₃	500	1514
	10000	2% HNO ₃	125	10114
	10000	2% HNO ₃	250	10214

Ce**CERIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: CeO ₂	1000	5% HNO ₃	125	1121
PURITY: ≥ 99.99%	1000	5% HNO ₃	250	1221
	1000	5% HNO ₃	500	1521
	10000	5% HNO ₃	125	10121
	10000	5% HNO ₃	250	10221

Cl	CHLORIDE	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: NH ₄ Cl PURITY: ≥ 99.000%	1000	H ₂ O	125
		1000	H ₂ O	250	1222
		1000	H ₂ O	500	1522

Co	COBALT	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Co metal PURITY: ≥ 99.999%	10	2% HNO ₃	125
		100	2% HNO ₃	125	0108
		1000	2% HNO ₃	125	1108
		1000	2% HNO ₃	250	1208
		1000	2% HNO ₃	500	1508
		10000	2% HNO ₃	125	10108
		10000	2% HNO ₃	250	10208

Cr	CHROMIUM III	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Cr metal PURITY: ≥ 99.99%	10	1.4% HNO ₃	125
		100	1.4% HNO ₃	125	0123(3)
		1000	1.4% HNO ₃	125	1123(3)
		1000	1.4% HNO ₃	250	1223(3)
		1000	1.4% HNO ₃	500	1523(3)
		10000	6.5% HNO ₃	125	10123(3)
		10000	6.5% HNO ₃	250	10223(3)

Cr	CHROMIUM VI	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: (NH ₄) ₂ Cr ₂ O ₇ PURITY: ≥ 99.98%	1000	H ₂ O	125
		1000	H ₂ O	250	1223(6)
		1000	H ₂ O	500	1523(6)

Cs	CESIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: CsNO ₃ PURITY: ≥ 99.998%	1000	0.35% HNO ₃	125
		1000	0.35% HNO ₃	250	1224
		1000	0.35% HNO ₃	500	1524
		10000	0.7% HNO ₃	125	10124
		10000	0.7% HNO ₃	250	10224

Cu	COPPER	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Cu metal PURITY: ≥ 99.999%	10	2% HNO ₃	125
		100	2% HNO ₃	125	0101
		1000	2% HNO ₃	125	1101
		1000	2% HNO ₃	250	1201
		1000	2% HNO ₃	500	1501
		10000	2% HNO ₃	125	10101
		10000	2% HNO ₃	250	10201

Dy**DYSPROSIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Dy ₂ O ₃	1000	5% HNO ₃	125	1125
PURITY: ≥ 99.99%	1000	5% HNO ₃	250	1225
	1000	5% HNO ₃	500	1525
	10000	7% HNO ₃	125	10125
	10000	7% HNO ₃	250	10225

Er**ERBIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Er ₂ O ₃	1000	5% HNO ₃	125	1126
PURITY: ≥ 99.98%	1000	5% HNO ₃	250	1226
	1000	5% HNO ₃	500	1526
	10000	5% HNO ₃	125	10126
	10000	5% HNO ₃	250	10226

Eu**EUROPIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Eu ₂ O ₃	1000	5% HNO ₃	125	1127
PURITY: ≥ 99.999%	1000	5% HNO ₃	250	1227
	1000	5% HNO ₃	500	1527
	10000	5% HNO ₃	125	10127
	10000	5% HNO ₃	250	10227

Fe**IRON**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Fe metal	10	1.4% HNO ₃	125	104
PURITY: ≥ 99.998%	100	1.4% HNO ₃	125	0104
	1000	1.4% HNO ₃	125	1104
	1000	1.4% HNO ₃	250	1204
	1000	1.4% HNO ₃	500	1504
	10000	3.5% HNO ₃	125	10104
	10000	3.5% HNO ₃	250	10204

Ga**GALLIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Ga metal	1000	5% HNO ₃	125	1128
PURITY: ≥ 99.999%	1000	5% HNO ₃	250	1228
	1000	5% HNO ₃	500	1528
	10000	5% HNO ₃	125	10128
	10000	5% HNO ₃	250	10228

Gd**GADOLINIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Gd ₂ O ₃	1000	5% HNO ₃	125	1129
PURITY: ≥ 99.999%	1000	5% HNO ₃	250	1229
	1000	5% HNO ₃	500	1529
	10000	5% HNO ₃	125	10129
	10000	5% HNO ₃	250	10229

Ge

GERMANIUM

SOURCE: Ge metal
 PURITY: $\geq 99.998\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	H ₂ O tr HNO ₃ / tr HF	125	130
100	H ₂ O tr HNO ₃ / tr HF	125	0130
1000	H ₂ O tr HNO ₃ / tr HF	125	1130
1000	H ₂ O tr HNO ₃ / tr HF	250	1230
1000	H ₂ O tr HNO ₃ / tr HF	500	1530
10000	H ₂ O tr HNO ₃ / tr HF	125	10130
10000	H ₂ O tr HNO ₃ / tr HF	250	10230

Hf

HAFNIUM

SOURCE: HfO₂
 PURITY: $\geq 99.998\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O tr HNO ₃ / tr HF	125	1131
1000	H ₂ O tr HNO ₃ / tr HF	250	1231
1000	H ₂ O tr HNO ₃ / tr HF	500	1531
10000	10% HNO ₃ / 0.7% HF	125	10131
10000	10% HNO ₃ / 0.7% HF	250	10231

Hg

MERCURY

SOURCE: Hg metal
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	10% HCl	125	132
100	3.3% HCl	125	0132
1000	3.5% HNO ₃	125	1132
1000	3.5% HNO ₃	250	1232
1000	3.5% HNO ₃	500	1532
10000	3.5% HNO ₃	125	10132
10000	3.5% HNO ₃	250	10232

Ho

HOLMIUM

SOURCE: Ho₂O₃
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	3.5% HNO ₃	125	133
100	3.5% HNO ₃	125	0133
1000	3.5% HNO ₃	125	1133
1000	3.5% HNO ₃	250	1233
1000	3.5% HNO ₃	500	1533
10000	5% HNO ₃	125	10133
10000	5% HNO ₃	250	10233

In

INDIUM

SOURCE: In metal
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	1.4% HNO ₃	125	135
100	1.4% HNO ₃	125	0135
1000	1.4% HNO ₃	125	1135
1000	1.4% HNO ₃	250	1235
1000	1.4% HNO ₃	500	1535
10000	3.5% HNO ₃	125	10135
10000	3.5% HNO ₃	250	10235

Ir	IRIDIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: IrCl ₃ PURITY: ≥ 99.9%	1000	3.3% HCl	125
		1000	3.3% HCl	250	1236
		1000	3.3% HCl	500	1536
		10000	3.3% HCl	125	10136
		10000	3.3% HCl	250	10236

K	POTASSIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: KNO ₃ PURITY: ≥ 99.998%	10	0.07% HNO ₃	125
		100	0.07% HNO ₃	125	0107
		1000	0.07% HNO ₃	125	1107
		1000	0.07% HNO ₃	250	1207
		1000	0.07% HNO ₃	500	1507
		10000	1.4% HNO ₃	125	10107
		10000	1.4% HNO ₃	250	10207

La	LANTHANUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: La ₂ O ₃ PURITY: ≥ 99.99%	1000	1.4% HNO ₃	125
		1000	1.4% HNO ₃	250	1237
		1000	1.4% HNO ₃	500	1537
		10000	1.4% HNO ₃	125	10137
		10000	1.4% HNO ₃	250	10237

Li	LITHIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Li ₂ CO ₃ PURITY: ≥ 99.99%	10	0.07% HNO ₃	125
		100	0.07% HNO ₃	125	0138
		1000	0.07% HNO ₃	125	1138
		1000	0.07% HNO ₃	250	1238
		1000	0.07% HNO ₃	500	1538
		10000	1.4% HNO ₃	125	10138
		10000	1.4% HNO ₃	250	10238

Lu	LUTHENIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Lu ₂ O ₃ PURITY: ≥ 99.99%	1000	1.4% HNO ₃	125
		1000	1.4% HNO ₃	250	1239
		1000	1.4% HNO ₃	500	1539
		10000	3.5% HNO ₃	125	10139
		10000	3.5% HNO ₃	250	10239

Mg	MAGNESIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Mg metal PURITY: ≥ 99.995%	10	0.07% HNO ₃	125	140	
	100	0.07% HNO ₃	125	0140	
	1000	0.07% HNO ₃	125	1140	
	1000	0.07% HNO ₃	250	1240	
	1000	0.07% HNO ₃	500	1540	
	10000	1.4% HNO ₃	125	10140	
	10000	1.4% HNO ₃	250	10240	

Mn	MANGANESE	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Mn metal PURITY: ≥ 99.99%	10	2% HNO ₃	125	105	
	100	2% HNO ₃	125	0105	
	1000	2% HNO ₃	125	1105	
	1000	2% HNO ₃	250	1205	
	1000	2% HNO ₃	500	1505	
	10000	2% HNO ₃	125	10105	
	10000	2% HNO ₃	250	10205	

Mo	MOLYBDENUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: (NH ₄) ₆ Mo ₇ O ₂₄ ·xH ₂ O PURITY: ≥ 99.99%	10	H ₂ O tr NH ₄ OH	125	141	
	100	H ₂ O tr NH ₄ OH	125	0141	
	1000	H ₂ O tr NH ₄ OH	125	1141	
	1000	H ₂ O tr NH ₄ OH	250	1241	
	1000	H ₂ O tr NH ₄ OH	500	1541	
	10000	H ₂ O tr NH ₄ OH	125	10141	
	10000	H ₂ O tr NH ₄ OH	250	10241	

Na	SODIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Na ₂ CO ₃ PURITY: ≥ 99.999%	10	0.07% HNO ₃	125	142	
	100	0.07% HNO ₃	125	0142	
	1000	0.07% HNO ₃	125	1142	
	1000	0.07% HNO ₃	250	1242	
	1000	0.07% HNO ₃	500	1542	
	10000	1.4% HNO ₃	125	10142	
	10000	1.4% HNO ₃	250	10242	

Nb	NIOBIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Nb metal PURITY: ≥ 99.9%	1000	H ₂ O tr HNO ₃ / tr HF	125	1173	
	1000	H ₂ O tr HNO ₃ / tr HF	250	1273	
	1000	H ₂ O tr HNO ₃ / tr HF	500	1573	
	10000	H ₂ O tr HNO ₃ / tr HF	125	10173	
	10000	H ₂ O tr HNO ₃ / tr HF	250	10273	

Nd**NEODYMIUM**

SOURCE: Nd_2O_3
 PURITY: $\geq 99.97\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	1.4% HNO_3	125	1174
1000	1.4% HNO_3	250	1274
1000	1.4% HNO_3	500	1574
10000	3.5% HNO_3	125	10174
10000	3.5% HNO_3	250	10274

Ni**NICKEL**

SOURCE: Ni metal
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	1.4% HNO_3	125	103
100	1.4% HNO_3	125	0103
1000	1.4% HNO_3	125	1103
1000	1.4% HNO_3	250	1203
1000	1.4% HNO_3	500	1503
10000	2.5% HNO_3	125	10103
10000	2.5% HNO_3	250	10203

Os**OSMIUM**

SOURCE: $(\text{NH}_4)_2\text{OsCl}_6$
 PURITY: $\geq 99.995\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	5% HCl	125	1143
1000	5% HCl	250	1243
1000	5% HCl	500	1543

P**PHOSPHORUS**

SOURCE: H_3PO_4
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	1144
1000	H_2O	250	1244
1000	H_2O	500	1544
10000	H_2O	125	10144
10000	H_2O	250	10244

Pb**LEAD**

SOURCE: $\text{Pb}(\text{NO}_3)_2$
 PURITY: $\geq 99.998\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	0.35% HNO_3	125	117
100	0.35% HNO_3	125	0117
1000	0.35% HNO_3	125	1117
1000	0.35% HNO_3	250	1217
1000	0.35% HNO_3	500	1517
10000	0.35% HNO_3	125	10117
10000	0.35% HNO_3	250	10217

Pd**PALLADIUM**

SOURCE: Pd(NO₃)₂
 PURITY: ≥ 99.998%

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	3.3% HCl	125	1145
1000	3.3% HCl	250	1245
1000	3.3% HCl	500	1545
10000	3.3% HCl	125	10145
10000	3.3% HCl	250	10245
1000	5% HNO ₃	125	1145N
1000	5% HNO ₃	250	1245N
1000	5% HNO ₃	500	1545N

Pr**PRASEODYMIUM**

SOURCE: Pr₆O₁₁
 PURITY: ≥ 99.997%

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	3.5% HNO ₃	125	1146
1000	3.5% HNO ₃	250	1246
1000	3.5% HNO ₃	500	1546
10000	7% HNO ₃	125	10146
10000	7% HNO ₃	250	10246

Pt**PLATINUM**

SOURCE: Pt metal
 PURITY: ≥ 99.98%

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	3.3% HCl	125	1147
1000	3.3% HCl	250	1247
1000	3.3% HCl	500	1547
10000	3.3% HCl	125	10147
10000	3.3% HCl	250	10247
1000	1.6% HNO ₃ / tr HCl	125	1147N
1000	1.6% HNO ₃ / tr HCl	250	1247N
1000	1.6% HNO ₃ / tr HCl	500	1547N

Rb**RUBIDIUM**

SOURCE: RbNO₃
 PURITY: ≥ 99.94%

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	0.1% HNO ₃	125	1148
1000	0.1% HNO ₃	250	1248
1000	0.1% HNO ₃	500	1548
10000	1% HNO ₃	125	10148
10000	1% HNO ₃	250	10248

Re**RHENIUM**

SOURCE: Re metal
 PURITY: ≥ 99.998%

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	2% HNO ₃	125	1149
1000	2% HNO ₃	250	1249
1000	2% HNO ₃	500	1549
10000	2% HNO ₃	125	10149
10000	2% HNO ₃	250	10249

Rh**RHODIUM**

SOURCE: RhCl_3
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	5% HCl	125	150
100	5% HCl	125	0150
1000	5% HCl	125	1150
1000	5% HCl	250	1250
1000	5% HCl	500	1550
10000	7% HCl	125	10150
10000	7% HCl	250	10250

Ru**RUTHENIUM**

SOURCE: $(\text{NH}_4)_2\text{RuCl}_6$
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	3.3% HCl	125	1151
1000	3.3% HCl	250	1251
1000	3.3% HCl	500	1551
10000	7% HCl	125	10151
10000	7% HCl	250	10251

S**SULFUR**

SOURCE: H_2SO_4
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	1152
1000	H_2O	250	1252
1000	H_2O	500	1552
10000	H_2O	125	10152
10000	H_2O	250	10252

Sb**ANTIMONY**

SOURCE: Sb metal
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	0.7% HNO_3 / 3% tartacid	125	153
100	0.7% HNO_3 / 3% tartacid	125	0153
1000	0.7% HNO_3 / 3% tartacid	125	1153
1000	0.7% HNO_3 / 3% tartacid	250	1253
1000	0.7% HNO_3 / 3% tartacid	500	1553
10000	2% HNO_3 / 3% tartacid	125	10153
10000	2% HNO_3 / 3% tartacid	250	10253

Sc**SCANDIUM**

SOURCE: Sc_2O_3
 PURITY: $\geq 99.997\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	5% HNO_3	125	155
100	5% HNO_3	125	0155
1000	5% HNO_3	125	1155
1000	5% HNO_3	250	1255
1000	5% HNO_3	500	1555
10000	5% HNO_3	125	10155
10000	5% HNO_3	250	10255

Se	SELENIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Se metal PURITY: ≥ 99.998%	10	1.4% HNO ₃	125
		100	1.4% HNO ₃	125	0154
		1000	1.4% HNO ₃	125	1154
		1000	1.4% HNO ₃	250	1254
		1000	1.4% HNO ₃	500	1554
		10000	1.75% HNO ₃	125	10154
		10000	1.75% HNO ₃	250	10254

Si	SILICON	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: SiO ₂ PURITY: ≥ 99.996%	1000	H ₂ O / tr HF / tr HNO ₃	125
	1000	H ₂ O / tr HF / tr HNO ₃	250	1256	
	1000	H ₂ O / tr HF / tr HNO ₃	500	1556	
	10000	0.7% HNO ₃ / 0.65% HF	125	10156	
	10000	0.7% HNO ₃ / 0.65% HF	250	10256	
	1000	0.2% NaOH	125	1156N	
	1000	0.2% NaOH	250	1256N	
	1000	0.2% NaOH	500	1556N	

SiO ₂	SILICA	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: SiO ₂ PURITY: ≥ 99.995%	1000	0.7% HNO ₃ / tr HF	125
	1000	0.7% HNO ₃ / tr HF	250	1256O	
	1000	0.7% HNO ₃ / tr HF	500	1556O	
	1000	0.2% NaOH	125	1156ONA	
	1000	0.2% NaOH	250	1256ONA	
	1000	0.2% NaOH	500	1556ONA	

Sm	SAMARIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Sm ₂ O ₃ PURITY: ≥ 99.96%	1000	3.5% HNO ₃	125
	1000	3.5% HNO ₃	250	1257	
	1000	3.5% HNO ₃	500	1557	
	10000	3.5% HNO ₃	125	10157	
	10000	3.5% HNO ₃	250	10257	

Sn	TIN	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		SOURCE: Sn metal PURITY: ≥ 99.999%	10	5% HNO ₃ / tr HF	125
	100	5% HNO ₃ / tr HF	125	0158	
	1000	H ₂ O tr HNO ₃ / tr HF	125	1158	
	1000	H ₂ O tr HNO ₃ / tr HF	250	1258	
	1000	H ₂ O tr HNO ₃ / tr HF	500	1558	
	10000	H ₂ O tr HNO ₃ / tr HF	125	10158	
	10000	H ₂ O tr HNO ₃ / tr HF	250	10258	
	1000	6.3% HCl	125	1158C	
	1000	6.3% HCl	250	1258C	
	1000	6.3% HCl	500	1558C	

Sr**STRONTIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: SrCO ₃	10	0.07% HNO ₃	125	159
PURITY: ≥ 99.999%	100	0.07% HNO ₃	125	0159
	1000	0.07% HNO ₃	125	1159
	1000	0.07% HNO ₃	250	1259
	1000	0.07% HNO ₃	500	1559
	10000	1.4% HNO ₃	125	10159
	10000	1.4% HNO ₃	250	10259

Ta**TANTALUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Ta metal	1000	0.1% HNO ₃ / tr HF	125	1160
PURITY: ≥ 99.99%	1000	0.1% HNO ₃ / tr HF	250	1260
	1000	0.1% HNO ₃ / tr HF	500	1560
	10000	1% HNO ₃ / 0.4% HF	125	10160
	10000	1% HNO ₃ / 0.4% HF	250	10260

Tb**TERBIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Tb ₄ O ₇	10	3.5% HNO ₃	125	161
PURITY: ≥ 99.996%	100	3.5% HNO ₃	125	0161
	1000	3.5% HNO ₃	125	1161
	1000	3.5% HNO ₃	250	1261
	1000	3.5% HNO ₃	500	1561
	10000	3.5% HNO ₃	125	10161
	10000	3.5% HNO ₃	250	10261

Te**TELLURIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Te metal	1000	10% HCl	125	1162
PURITY: ≥ 99.998%	1000	10% HCl	250	1262
	1000	10% HCl	500	1562
	10000	10% HCl	125	10162
	10000	10% HCl	250	10262
	1000	7% HNO ₃	125	1162N
	1000	7% HNO ₃	250	1262N
	1000	7% HNO ₃	500	1562N

Th**THORIUM**

	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
SOURCE: Th(NO ₃) ₄ ·4H ₂ O	10	3% HNO ₃	125	163
PURITY: ≥ 99.998%	100	3% HNO ₃	125	0163
	1000	3% HNO ₃	125	1163
	1000	3% HNO ₃	250	1263
	1000	3% HNO ₃	500	1563
	10000	3.5% HNO ₃	125	10163
	10000	3.5% HNO ₃	250	10263

Ti**TITANIUM**

SOURCE: Ti metal

PURITY: $\geq 99.96\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	1.4% HNO ₃ / tr HF	125	164
100	1.4% HNO ₃ / tr HF	125	0164
1000	1.4% HNO ₃ / tr HF	125	1164
1000	1.4% HNO ₃ / tr HF	250	1264
1000	1.4% HNO ₃ / tr HF	500	1564
10000	0.5% HNO ₃ / 0.7% HF	125	10164
10000	0.5% HNO ₃ / 0.7% HF	250	10264

Tl**THALLIUM**SOURCE: TlNO₃PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	0.5% HNO ₃	125	165
100	0.5% HNO ₃	125	0165
1000	0.5% HNO ₃	125	1165
1000	0.5% HNO ₃	250	1265
1000	0.5% HNO ₃	500	1565
10000	3.5% HNO ₃	125	10165
10000	3.5% HNO ₃	250	10265

Tm**THULIUM**SOURCE: Tm₂O₃PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	3.5% HNO ₃	125	1166
1000	3.5% HNO ₃	250	1266
1000	3.5% HNO ₃	500	1566
10000	3.5% HNO ₃	125	10166
10000	3.5% HNO ₃	250	10266

U**URANIUM**SOURCE: UO₂(NO₃)₂·6H₂OPURITY: $\geq 99.994\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	1% HNO ₃	125	167
100	1% HNO ₃	125	0167
1000	1% HNO ₃	125	1167
1000	1% HNO ₃	250	1267
1000	1% HNO ₃	500	1567
10000	2% HNO ₃	125	10167
10000	2% HNO ₃	250	10267

V**VANADIUM**SOURCE: V₂O₅PURITY: $\geq 99.995\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	1.4% HNO ₃	125	168
100	1.4% HNO ₃	125	0168
1000	1.4% HNO ₃	125	1168
1000	1.4% HNO ₃	250	1268
1000	1.4% HNO ₃	500	1568
10000	5% HNO ₃	125	10168
10000	5% HNO ₃	250	10268

W**TUNGSTEN**

SOURCE: W metal
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	0.1% HNO ₃ / 1% HF	125	1169
1000	0.1% HNO ₃ / 1% HF	250	1269
1000	0.1% HNO ₃ / 1% HF	500	1569
10000	1.5% HNO ₃ / 2.9% HF	125	10169
10000	1.5% HNO ₃ / 2.9% HF	250	10269

Y**YTTRIUM**

SOURCE: Y₂O₃
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	1.4% HNO ₃	125	170
100	1.4% HNO ₃	125	0170
1000	1.4% HNO ₃	125	1170
1000	1.4% HNO ₃	250	1270
1000	1.4% HNO ₃	500	1570
10000	1.4% HNO ₃	125	10170
10000	1.4% HNO ₃	250	10270

Yb**YTTERBIUM**

SOURCE: Yb₂O₃
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	5% HNO ₃	125	1171
1000	5% HNO ₃	250	1271
1000	5% HNO ₃	500	1571
10000	5% HNO ₃	125	10171
10000	5% HNO ₃	250	10271

Zn**ZINC**

SOURCE: Zn metal
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
10	1.4% HNO ₃	125	102
100	1.4% HNO ₃	125	0102
1000	1.4% HNO ₃	125	1102
1000	1.4% HNO ₃	250	1202
1000	1.4% HNO ₃	500	1502
10000	1.4% HNO ₃	125	10102
10000	1.4% HNO ₃	250	10202

Zr**ZIRCONIUM**

SOURCE: ZrO₂
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O / tr HNO ₃ / tr HF	125	1172
1000	H ₂ O / tr HNO ₃ / tr HF	250	1272
1000	H ₂ O / tr HNO ₃ / tr HF	500	1572
10000	H ₂ O / 0.25% HF	125	10172
10000	H ₂ O / 0.25% HF	250	10272

MULTI-ELEMENT STANDARDS

GENERAL PROPERTIES

ELEMENT SOURCES:	Highest purity starting materials available
WATER:	18 megaohm
BOTTLES:	LDPE Low Density Polyethylene
EXPIRATION DATE:	1 year from date of shipping
ACIDS:	Purified Acids
STORAGE RECOMMENDATION:	Room temperature

2

2 µg/ml

Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mg, Mn, Ni, Pb, Sb, Se, Tl, V, Zn

MATRIX

VOL. (ML)

CATALOGUE #

3.5% HNO₃

250

028222

10

10 µg/ml

Be, Mo, Sb, Sn, Te, Y

MATRIX

VOL. (ML)

CATALOGUE #

1% HCl

250

028318

10

10 µg/ml

Au, Ir, Pd, Pt, Re, Rh, Ru, Te

MATRIX

VOL. (ML)

CATALOGUE #

3.3% HCl

250

028223

10

10 µg/ml

Ge, Hf, Mo, Nb, Sn, Ta, Ti, W, Zr

MATRIX

VOL. (ML)

CATALOGUE #

3.5% HNO₃
+ 0.5% HF

250

028323

10

10 µg/ml

As, B, Ba, Be, Bi, Cd, Ga, In, Pb, Sb, Se, Tl, V

MATRIX

VOL. (ML)

CATALOGUE #

3.5% HNO₃

250

028324

10

10 µg/ml

Ag, Al, Ca, Co, Cr, Cs, Cu, Fe, K, Li, Mg, Mn, Na, Ni, Rb, Sr, Zn

MATRIX

VOL. (ML)

CATALOGUE #

3.5% HNO₃

250

028325

MULTI-ELEMENT STANDARDS

10	10 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sm, Tb, Th, Yb	2.5% HNO ₃	250	028319

10	10 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th, Tm, U, Y, Yb	3.5% HNO ₃ tr HF	250	028321

10	10 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Al, As, B, Ba, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, Li, Mg, Mn, Na, Ni, Pb, Rb, Sr, Th, Tl, U, V, Zn	2.5% HNO ₃	250	028317

20	20 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Ni, Pb, Se, Th, Tl, U, V, Zn	3.5% HNO ₃	250	028220

20	20 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn	3.5% HNO ₃ + tr HF	250	028321

50	50 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	As, Bi, Ga, Ge, In, Pb, Sb, Se, Sn, Te, Ti, V	4.9% HCl	250	028314

50	50 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Al, B, Ca, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Si, Sn, Ti, V, Zn, Zr	4.9% HCl + tr HF	250	028316

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Au, Ir, Pd, Pt, Rh, Ru	3.3% HCl	125	018320

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Au, Ir, Os, Pd, Pt, Re, Rh, Ru	4.9% HCl	125	018313

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Al, B, Hf, Mo, Nb, P, Si, Ta, Ti, W, Zr	3.5% HNO ₃ + 1.0% HF	250	028312

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Cd, Co, Cu, Cr, Fe, Mn, Ni, Pb, V, Zn	2.5% HNO ₃	250	028311

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ba, Be, Ca, Cs, K, Li, Mg, Na, Rb, Sr	2.5% HNO ₃	250	028310

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	As, Be, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Mo, Ni, Pb, Sb, Se, Tl, Ti, V, Zn	5 % HNO ₃	250	028219

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	As, Be, Ca, Cd, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sr, Tl, Ti, V, Zn	5% HNO ₃ tr HF	250	028221

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ag, Al, B, Ba, K (1000), Na, Si (50)	4 % HNO ₃	250	028207

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si (50), Ti, Tl, V, Zn	5% HNO ₃ + tr HF	250	028226

100	100 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K (1000), Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si (50), Sr, Ti, Tl, V, Zn	5% HNO ₅ + tr HF	250	028228

250	250 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Al (100), Ca, Cu, Fe, Mg, Na, Ni, Pb, Si (100), V, Zn	2.5% HCl	250	028113

MULTI-ELEMENT STANDARDS

500	500 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ca, Cu, Fe, Mg, Ni, Zn	2.5% HCl	250	028112

500	500 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Al, Na, Pb, Si, V (1000)	2.5% HCl	250	028111

1000	1000 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ca, Mg	5% HNO ₃	250	028100

1000	1000 µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	K, Na	2.5% HNO ₃	250	028101

Various	Various µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ca (2000), K (1000), Li (1000), Mg (150), Na (250)	2.5% HNO ₃	250	028104

Various	Various µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Co (1400), Cr (800), Cu (800), Fe (1000), Mn (500), Ni (1400)	2.5% HNO ₃	250	028103

Various	Various µg/ml	MATRIX	VOL. (ML)	CATALOGUE #
	Ag (30), Ca (20), Cd (10), Cu (100), Fe (100), Mg (10), Mn (40), Pb (200), Sr (30), Zn (2)	2.5% HNO ₃	250	028107

ION CHROMATOGRAPHY STANDARDS

GENERAL PROPERTIES

ELEMENT SOURCES:	Highest purity starting materials available
WATER:	18 megaohm
BOTTLES:	LDPE (Low Density Polyethylene)
EXPIRATION DATE:	1 year from date of shipping
ACIDS:	Purified Acids
STORAGE RECOMMENDATION:	Room temperature



ACETATE

SOURCE: $\text{NaC}_2\text{H}_3\text{O}_2$
PURITY: $\geq 98.72\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11OAC
1000	H_2O	500	15OAC



BARIUM

SOURCE: $\text{Ba}_2(\text{NO}_3)_2$
PURITY: $\geq 99.995\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	0.1% HNO_3	125	11BA
1000	0.1% HNO_3	500	15BA



BENZOATE

SOURCE: Benzoic acid
PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11BEN
1000	H_2O	500	15BEN



BROMIDE

SOURCE: KBrO_3
PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11BR
1000	H_2O	500	15BR



BROMATE

SOURCE: KBrO_3
PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11BRO3
1000	H_2O	500	15BRO3



CALCIUM

SOURCE: CaO
 PURITY: $\geq 99.95\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	0.09% HNO_3	125	11CA
1000	0.09% HNO_3	500	15CA



CHLORIDE

SOURCE: KCl
 PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11CL
1000	H_2O	500	15CL



CHLORITE

SOURCE: NaClO_2
 PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11CLO2
1000	H_2O	500	15CLO2



CHLORATE

SOURCE: KClO_3
 PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11CLO3
1000	H_2O	500	15CLO3



PERCHLORATE

SOURCE: KClO_4
 PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11CLO4
1000	H_2O	500	15CLO4



CHROMATE

SOURCE: $\text{NH}_4\text{Cr}_2\text{O}_7$
 PURITY: $\geq 99.999\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11CRO4
1000	H_2O	500	15CRO4



FLUORIDE

SOURCE: NaF
 PURITY: $\geq 99.99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H_2O	125	11F
1000	H_2O	500	15F



FORMATE

SOURCE: NaHCO_2
 PURITY: $\geq 99\%$

CONC. ($\mu\text{g/ml}$)	MATRIX	VOL. (ml)	CATALOGUE #
1000	$\text{H}_2\text{O}+0.43\%$ stab.	125	11HCO
1000	$\text{H}_2\text{O}+0.43\%$ stab.	500	15HCO

I⁻**IODINE**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O+1% stab.	125	11I
1000	H ₂ O+1% stab.	500	15I

SOURCE: NH₄I
 PURITY: ≥ 87.56%

K⁺**POTASSIUM**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	0.1%HNO ₃	125	11K
1000	0.1%HNO ₃	500	15K

SOURCE: KNO₃
 PURITY: ≥ 99.997%

C₃H₅O₃⁻**LACTATE**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O	125	11LCT
1000	H ₂ O	500	15LCT

SOURCE: Lactic Acid
 PURITY: ≥ 10.1930%

Mg⁺²**MAGNESIUM**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	0.1%HNO ₃	125	11MG
1000	0.1%HNO ₃	500	15MG

SOURCE: Mg metal
 PURITY: ≥ 99.999%

C₄H₄O₅⁻²**MALATE**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O	125	11MLA
1000	H ₂ O	500	15MLA

SOURCE: Malic Acid
 PURITY: ≥ 99%

C₄H₂O₄⁻²**MALEATE**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O	125	11MLE
1000	H ₂ O	500	15MLE

SOURCE: Maleic Acid
 PURITY: ≥ 99%

Na⁺**SODIUM**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	0.1%HNO ₃	125	11NA
1000	0.1%HNO ₃	500	15NA

SOURCE: Na₂CO₃
 PURITY: ≥ 99.999%

NH₄⁺**AMMONIUM**

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O	125	11NH4
1000	H ₂ O	500	15NH4

SOURCE: NH₄Cl
 PURITY: ≥ 99%



AMMONIUM AS N

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
NH_4Cl	1000	H_2O	125	11NNH4
PURITY: $\geq 99\%$	1000	H_2O	500	15NNH4



NITRATE

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
NaNO_3	1000	H_2O	125	11NO3
PURITY: $\geq 99\%$	1000	H_2O	500	15NO3



NITRATE AS N

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
NaNO_3 or HNO_3	1000	H_2O	125	11NNO3
PURITY: $\geq 99\%$	1000	H_2O	500	15NNO3



NITRITE

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
NaNO_2	1000	H_2O	125	11NO2
PURITY: $\geq 99.6\%$	1000	H_2O	500	15NO2



NITRITE AS N

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
NaNO_2	1000	H_2O	125	11NNO2
PURITY: $\geq 99\%$	1000	H_2O	500	15NNO2



PROPIONATE

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
Sodium Propionate	1000	H_2O	125	11OPR
PURITY: $\geq 99\%$	1000	H_2O	500	15OPR



OXALATE

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
$\text{Na}_2\text{C}_2\text{O}_4$	1000	H_2O	125	11OXA
PURITY: $\geq 99\%$	1000	H_2O	500	15OXA



PHOSPHATE

SOURCE:	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
$\text{NH}_4\text{H}_2\text{PO}_4$	1000	H_2O	125	11PO4
PURITY: $\geq 99\%$	1000	H_2O	500	15PO4

PO₄-P

PHOSPHATE AS P

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O	125	11PPO4
1000	H ₂ O	500	15PPO4

SOURCE: NH₄H₂PO₄
 PURITY: ≥ 99%

SO₄⁻²

SULFATE

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
1000	H ₂ O	125	11SO4
1000	H ₂ O	500	15SO4

SOURCE: K₂SO₄
 PURITY: ≥ 99%

MULTI - ION STANDARDS

100

100 µg/ml

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
100	H ₂ O	250	028550

Cl⁻, F⁻, NO₃⁻, SO₄²⁻, PO₄³⁻

Various

VARIOUS µg/ml

CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
	H ₂ O	250	028555

Br⁻ (100), Cl⁻ (30), F⁻ (20), NO₃⁻ (100),
 NO₂⁻ (100), PO₄³⁻ (150), SO₄²⁻ (150)

ATOMIC ABSORPTION REAGENTS

MATRIX MODIFIERS

Pd	PALLADIUM MODIFIER	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		10000	HNO ₃	50	1001175
		5000	HNO ₃	50	501175
		2000	HNO ₃	100	211175

Mg	MAGNESIUM MODIFIER	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		10000	HNO ₃	100	1011204

PO₄	AMMONIUM DIHYDROGEN ORTHOPHOSPHATE MODIFIER	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		40000	HNO ₃	100	4011205

NH₄	AMMONIUM NITRATE	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		1000	HNO ₃	100	1011206

IONIZATION BUFFERS

Cs	CESIUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		1000	HNO ₃	500	1051201

La	LANTHANUM	CONC. (µg/ml)	MATRIX	VOL. (ml)	CATALOGUE #
		10000	HNO ₃	500	1051202
		10000	HCl	500	1051202C
		50000	HNO ₃	500	5051202

STABLE ISOTOPE STANDARDS SOLUTIONS

^{109}Ag

$^{109}\text{SILVER}$

SOURCE: Ag metal
MATRIX: 5% HNO_3

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
107	0.0058	0.518392	50100
109	0.9942	0.481608	

^{135}Ba

$^{135}\text{BARIUM}$

SOURCE: BaCO_3
MATRIX: 5% HNO_3

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
130	0.001	0.1058	50160
132	0.057	0.1012	
134	0.466	2.417	
135	93.38	6.592	
136	1.640	7.853	
137	0.890	11.232	
138	3.560	71.699	

^{106}Cd

$^{106}\text{CADMIUM}$

SOURCE: Cd metal
MATRIX: 5% HNO_3

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
106	0.7901	0.0125	50140
108	0.0068	0.0089	
110	0.303	0.1249	
111	0.26	0.128	
112	0.0556	0.2413	
113	0.0173	0.1222	
114	0.0621	0.2873	
116	0.0118	0.0749	

^{50}Cr

$^{50}\text{CHROMIUM}$

SOURCE: Cr metal
MATRIX: 5% HNO_3

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
50	0.9675	0.043452	50230
52	0.0302	0.837895	
53	0.0018	0.095006	
54	<0.0005	0.023647	

^{65}Cu

$^{65}\text{COPPER}$

SOURCE: Cu metal
MATRIX: 5% HNO_3

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
63	0.0031	0.69174	50010
65	0.9969	0.30826	

STABLE ISOTOPE STANDARDS SOLUTIONS

⁵⁴Fe

⁵⁴IRON

SOURCE: Fe metal
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
54	0.9720	0.581	50040
56	0.0275	0.9175	
57	0.0005	0.0215	
58	<0.0001	0.0029	

⁵⁷Fe

⁵⁷IRON

SOURCE: Fe metal
MATRIX: 7.5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
54	0.001	0.581	50041
56	0.0745	0.9175	
57	0.9245	0.0215	
58	<0.0005	0.0029	

²⁵Mg

²⁵MAGNESIUM

SOURCE: MgO
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
24	0.00963	0.78992	50400
25	0.98814	0.10003	
26	0.00223	0.11005	

⁶¹Ni

⁶¹NICKEL

SOURCE: Ni metal
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
58	0.0013	0.68274	50030
60	0.0019	0.26095	
61	0.9944	0.01134	
62	<0.0005	0.03593	
64	0.0019	0.00904	

²⁰⁴Pb

²⁰⁴LEAD

SOURCE: Pb metal
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
204	0.6929	0.014245	50170
206	0.1227	0.241447	
207	0.0657	0.220827	
208	0.1187	0.523481	

⁷⁸Se

⁷⁸SELENIUM

SOURCE: Se metal
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
74	0.0006	0.0088	50540
76	0.0011	0.0895	
77	0.0017	0.0765	
78	0.9858	0.2351	
80	0.01	0.4962	
82	0.0008	0.0939	

⁸²Se

⁸²SELENIUM

SOURCE: Se metal
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
74	0.0016	0.0088	50541
76	0.0029	0.0895	
77	0.0033	0.0765	
78	0.0059	0.2351	
80	0.0196	0.4962	
82	0.9666	0.0939	

¹²²Sn

¹²²TIN

SOURCE: Sn metal
MATRIX: 5% HNO₃ tr HF

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
112	0.0003	0.00973	50580
114	0.0003	0.00652	
115	0.0003	0.00359	
116	0.0034	0.14532	
117	0.0036	0.07675	
118	0.0095	0.24218	
119	0.0101	0.08583	
120	0.0378	0.3259	
122	0.922	0.04629	
124	0.0136	0.05789	

⁸⁶Sr

⁸⁶STRONTIUM

SOURCE: SrCO₃
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
84	0.0008	0.005574	50590
86	0.9702	0.098566	
87	0.0078	0.070015	
88	0.0212	0.825845	

²⁰³Tl

²⁰³THALLIUM

SOURCE: Tl₂O₃
MATRIX: 5% HCl

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
203	97.10	29.524	50650
205	2.90	70.476	

⁶⁷Zn

⁶⁷ZINC

SOURCE: Zn metal
MATRIX: 5% HNO₃

MASS	CERTIFIED ABUNDANCE	NATURAL ABUNDANCE	CATALOGUE #
64	0.1113	0.4863	50020
66	0.0195	0.279	
67	0.946	0.041	
68	0.0228	0.1875	
70	0.00054	0.62	

QUOTATION REQUEST FORM

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This form is intended for one
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FROM

Name:
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DESCRIBE YOUR BLEND:

Analyte	Concentration	Analyte	Concentration
1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

UNITS:

- µg/ml
- µg/l

VOLUME:

- 125 ml
- 250 ml
- 500 ml
- 1000 ml

COMMENTS:.....



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