

Trace Impurities in High Purity Reagents
Inductively Coupled Plasma - Mass Spectrometry
Parts Per Billion (ng/g)

Sample ID: Liquid Sample 1

	Detection			Detection	
	<u>ppb</u>	<u>Limit</u>		<u>ppb</u>	<u>Limit</u>
Aluminum	ND	20	Molybdenum	9.9	2
Antimony	ND	1	Neodymium	ND	0.1
Arsenic	ND	7	Nickel	14	0.4
Barium	2.04	0.3	Niobium	ND	0.1
Beryllium	0.4	0.3	Osmium	ND	0.1
Bismuth	ND	0.1	Palladium	ND	0.1
Boron	ND	10	Phosphorus	22500	300
Bromine	124	20	Platinum	ND	0.1
Cadmium	1.06	0.1	Potassium	200000	2000
Calcium	4900	1000	Praseodymium	ND	0.1
Cerium	ND	0.1	Rhenium	ND	0.1
Cesium	ND	0.1	Rhodium	ND	0.1
Chromium	42	10	Rubidium	4.5	0.1
Cobalt	1.23	0.1	Ruthenium	ND	0.1
Copper	10.8	1	Samarium	ND	0.1
Dysprosium	ND	0.1	Selenium	242	10
Erbium	ND	0.1	Silicon	1210	90
Europium	ND	0.1	Silver	ND	0.1
Gadolinium	ND	0.2	Sodium	MATRIX	
Gallium	ND	1	Strontium	4.1	0.1
Germanium	ND	0.6	Tantalum	ND	0.1
Gold	ND	0.7	Tellurium	ND	0.2
Hafnium	ND	0.1	Thallium	ND	0.1
Holmium	ND	0.1	Thorium	ND	0.1
Iodine	ND	5	Thulium	ND	0.1
Iridium	ND	0.1	Tin	1.06	0.2
Iron	9600	300	Titanium	6.8	4
Lanthanum	ND	0.1	Tungsten	1.29	0.1
Lead	ND	0.4	Uranium	ND	0.1
Lithium	1.03	0.6	Vanadium	ND	6
Lutetium	ND	20	Ytterbium	ND	0.1
Magnesium	15800	6	Yttrium	ND	0.1
Manganese	15.1	4	Zinc	53	7
Mercury	ND	1	Zirconium	ND	0.7

Date Analyzed: 10-22-99

MATRIX = Major element

Elements Not Analyzed: All Gases, C, S, Sc, In, Tb

Quality Control Summary

Sample: Liquid Sample 1

Matrix: Liquid

Parts Per Billion (ng/g)

	<u>Sample</u>	<u>Duplicate</u>	<u>Avg</u>	<u>%</u> <u>RPD</u>	<u>Spike</u> <u>Conc.</u>	<u>MS</u> <u>Result</u>	<u>MS</u> <u>%Rec</u>
Aluminum	ND	ND	ND		1000	960	96
Antimony	ND	ND	ND		1000	990	99
Arsenic	ND	ND	ND		1000	1110	111
Barium	2.04	2.21	2.125		1000	970	97
Beryllium	0.4	0.53	0.465		1000	930	93
Boron	ND	ND	ND		1000	930	93
Cadmium	1.06	0.99	1.025		1000	980	98
Calcium	4900	4900	4900		100000	102000	97
Chromium	42	40	41		1000	1000	96
Cobalt	1.23	1.28	1.255		1000	970	97
Copper	10.8	10.3	10.55		1000	970	96
Iron	9600	9300	9450	3.2	100000	108000	99
Lead	ND	ND	ND		1000	980	98
Lithium	1.03	1.11	1.07		1000	910	91
Magnesium	15800	15400	15600	2.6	100000	112000	96
Manganese	15.1	15.1	15.1		1000	970	95
Mercury	ND	ND	ND		100	76	76
Molybdenum	9.9	9.5	9.7		1000	1020	101
Nickel	14	14.3	14.15	2.1	1000	980	97
Phosphorus	22500	22400	22450	0.4	100000	125000	103
Potassium	200000	195000	197500	2.5	100000	300000	103
Selenium	242	246	244	1.6	10000	11700	115
Silicon	1210	1170	1190		100000	98000	97
Silver	ND	ND	ND		1000	890	89
Strontium	4.1	4.1	4.1	0.0	1000	1000	100
Titanium	6.8	6.6	6.7		1000	1030	102
Thallium	ND	ND	ND		1000	980	98
Vanadium	ND	ND	ND		1000	1030	103
Zinc	53	45	49		1000	980	93

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