

**Interference-Free 3 Sigma Detection Limits (µg/filter)
For 47mm TFE Filters**

Element	ICP	IC	XRF Protocol Number					Matrix
			5	6	7	8	9	MAL
Li	0.600							
Be	0.008							
B	0.600							
F		0.10						
Na	0.240	0.20	1.63	1.15	0.813	0.575	0.406	
Mg	0.080		0.477	0.337	0.239	0.169	0.119	
Al	0.600		0.282	0.199	0.141	0.100	0.070	1.067
Si			0.099	0.070	0.049	0.035	0.025	0.371
P	0.800		0.018	0.013	0.009	0.006	0.004	0.255
S			0.101	0.072	0.051	0.036	0.025	0.151
Cl		0.10	0.085	0.060	0.043	0.030	0.021	0.106
K	0.240	0.10	0.042	0.030	0.021	0.015	0.011	0.063
Ca	0.400		0.034	0.024	0.017	0.012	0.009	0.093
Sc [#]			0.036	0.025	0.018	0.013	0.009	0.081
Ti	0.016		0.022	0.016	0.011	0.008	0.006	0.156
V	0.040		0.024	0.017	0.012	0.009	0.006	0.054
Cr	0.032		0.044	0.031	0.022	0.016	0.011	0.025
Cr (VI)•		0.00030						
Mn	0.012		0.039	0.027	0.019	0.014	0.010	0.025
Fe	0.280		0.055	0.039	0.028	0.019	0.014	0.066
Co	0.020		0.018	0.013	0.009	0.007	0.005	0.045
Ni	0.120		0.018	0.012	0.009	0.006	0.004	0.034
Cu	0.200		0.039	0.028	0.020	0.014	0.010	0.032
Zn	0.120		0.050	0.036	0.025	0.018	0.013	0.025
Ga			0.019	0.013	0.009	0.007	0.005	0.020
Ge			0.024	0.017	0.012	0.008	0.006	0.034
As	0.280		0.024	0.017	0.012	0.008	0.006	0.032
Se	0.600		0.018	0.013	0.009	0.007	0.005	0.018
Br		0.10	0.021	0.015	0.011	0.007	0.005	0.023
Rb	0.040		0.025	0.017	0.012	0.009	0.006	0.023
Sr	0.002		0.032	0.023	0.016	0.011	0.008	0.025
Y			0.041	0.029	0.020	0.014	0.010	0.165
Zr	0.040		0.058	0.041	0.029	0.020	0.014	0.149
Mo	0.080		0.035	0.024	0.017	0.012	0.009	0.131
Ru [#]								
Rh [#]			0.106	0.075	0.053	0.038	0.027	0.106
Pd	0.080		0.099	0.070	0.050	0.035	0.025	0.108
Ag	0.080		0.102	0.072	0.051	0.036	0.026	0.108
Cd	0.016		0.132	0.093	0.066	0.047	0.033	0.122
In			0.152	0.108	0.076	0.054	0.038	
Sn	0.400		0.176	0.125	0.088	0.062	0.044	0.172
Sb	0.200		0.275	0.195	0.138	0.097	0.069	0.163
Te [#]	0.200		0.091	0.065	0.046	0.032	0.023	0.183
I			0.177	0.125	0.088	0.063	0.044	0.210
Cs [#]			0.062	0.044	0.031	0.022	0.015	0.283
Ba	0.020		0.095	0.067	0.047	0.033	0.024	0.364
La			0.073	0.052	0.036	0.026	0.018	0.990
W [#]	0.160		0.044	0.031	0.022	0.015	0.011	0.057
Au [#]			0.040	0.028	0.020	0.014	0.010	0.050
Hg*	0.0002		0.034	0.024	0.017	0.012	0.008	0.050
Tl [#]	0.400		0.095	0.068	0.048	0.034	0.024	
Pb	0.200		0.044	0.031	0.022	0.015	0.011	0.054
Bi			0.046	0.032	0.023	0.016	0.011	
Th [#]			0.237	0.170	0.119	0.102	0.059	
U [#]			0.237	0.170	0.119	0.102	0.059	
NH ₄		0.10						
NO ₃		0.30						
PO ₄		0.20						
SO ₄		0.20						

• cellulose filter used for Cr V

* Hg by CVAA

Available by XRF upon request

Protocol 6 is equivalent to EPA Method IO-3.3

Matrix MAL represents the maximum allowed limits on a blank filter per EPA rules

Deposit Area (cm ²)	11.3
ICP Extraction Area (cm ²)	11.3
ICP Extraction Volume (mL)	40.0
IC Extraction Area (cm ²)	11.3
IC Extraction Volume (mL)	10.0

**3 Sigma Interference-Free Detection Limits (µg/filter)
For 8x10 Quartz Filters**

Element	ICP	IC	XRF Protocol Number			
			3	4	5	6
Li	3.67					
Be	0.05					
B	3.67					
F		0.6				
Na	1.47	1.2				
Mg	0.49					
Al	3.67		1721.6	1217.4	860.8	608.7
Si						
P	4.89		1173.3	829.7	586.7	414.8
S			181.9	128.6	90.9	64.3
Cl		0.6	58.2	41.1	29.1	20.6
K	1.47	0.6	21.5	15.2	10.7	7.6
Ca	2.45		15.4	10.9	7.7	5.4
Ti	0.10		11.3	8.0	5.6	4.0
V	0.24		11.1	7.9	5.6	3.9
Cr	0.20		11.6	8.2	5.8	4.1
Cr (VI)						
Mn	0.07		14.5	10.3	7.3	5.1
Fe	1.71		11.4	8.0	5.7	4.0
Co	0.12		9.6	6.8	4.8	3.4
Ni	0.73		10.4	7.3	5.2	3.7
Cu	1.22		10.0	7.0	5.0	3.5
Zn	0.73		9.9	7.0	4.9	3.5
Ga			12.4	8.7	6.2	4.4
Ge			10.5	7.5	5.3	3.7
As	1.71		8.8	6.2	4.4	3.1
Se	3.67		8.1	5.8	4.1	2.9
Br		0.6	7.6	5.4	3.8	2.7
Rb	0.24		9.7	6.8	4.8	3.4
Sr	0.01		11.6	8.2	5.8	4.1
Y			14.5	10.3	7.3	5.1
Zr	0.24		17.8	12.6	8.9	6.3
Mo	0.49		26.2	18.5	13.1	9.3
Pd	0.49		21.5	15.2	10.7	7.6
Ag	0.49		22.8	16.1	11.4	8.1
Cd	0.10		23.9	16.9	11.9	8.4
In			25.2	17.8	12.6	8.9
Sn	2.45		29.5	20.9	14.8	10.4
Sb	1.22		34.6	24.4	17.3	12.2
Ba	0.12		106.6	75.4	53.3	37.7
La			137.3	97.1	68.7	48.5
Hg *	0.04		18.9	13.4	9.5	6.7
Tl#	2.45		26.9	19.0	13.4	9.5
Pb	1.22		23.1	16.3	11.6	8.2
Bi						
NH ₄		0.6				
NO ₃		1.8				
PO ₄		1.2				
SO ₄		1.2				
C _{organic}		81.2				
C _{elemental}		81.2				

Available by XRF upon request

* Hg by CVAA

Deposit Area (cm ²)	406
ICP Extraction Area (cm ²)	66.4
ICP Extraction Volume (mL)	40.0
IC Extraction Area (cm ²)	16.6
IC Extraction Volume (mL)	10.0

Instrument Detection Limits (µg/L)
Liquid Samples
& Solid Sample Extracts

ELEMENT	ANALYTICAL METHOD		
	ICP	IC	CVAA
Ag	2		
Al	15		
As	7		
B	15		
Ba	0.5		
Be	0.2		
Br		10	
Ca	10		
Cd	0.4		
Cl		10	
Co	0.5		
Cr	0.8		
Cr (VI)		0.01	
Cu	5		
F		10	
Fe	7		
Hg			0.007
K	6	10	
Mg	2		
Mn	0.3		
Mo	2		
Na	6	10	
NH ₄		10	
Ni	3		
NO ₃		10	
P	20		
Pb	5		
Pd	2		
PO ₄		20	
Rb	1		
Sb	5		
Se	15		
Si			
Sn	10		
SO ₄		20	
Sr	0.1		
Ti	0.4		
Tl	10		
V	1		
Zn	3		
Zr			

ICP = Inductively-Coupled Plasma Emission
 IC = Ion Chromatography
 CVAA = Cold Vapor Atomic Absorption

Method 29 Metals

Element	CLN MDL (µg/L)	FH (250mL) MDL (µg)	BH (100mL) MDL (µg)
Ag	2.00	0.50	0.20
As	7.00	1.75	0.70
Ba	0.50	0.13	0.05
Be	0.20	0.05	0.02
Cd	0.40	0.10	0.04
Co	0.50	0.13	0.05
Cr	0.80	0.20	0.08
Cu	5.00	1.25	0.50
Hg	0.007	0.022	0.025 *
Mn	0.30	0.08	0.03
Ni	3.00	0.75	0.30
P	20.00	5.00	2.00
Pb	5.00	1.25	0.50
Sb	5.00	1.25	0.50
Se	15.00	3.75	1.50
Tl	10.00	2.50	1.00
Zn	3.00	0.75	0.30

* estimated, DL depends on sample volume