

Low limits, high standards

Elemental limits of detection

The Thermo Scientific™ Niton™ XL2 Plus handheld XRF analyzer is built for your most demanding applications. When low detection limits and high sample throughput is critical, the Niton XL2 Plus' combination of hardware and software provides you with solutions designed to meet your most difficult analytical requirements.

The chart below details the typical sensitivity, or limits of detection (LODs)¹, of the Niton XL2 Plus in parts per million (PPM) for various elements in pure silica (SiO₂). LODs are calculated as three standard deviations (99.7% confidence interval) for each element using a 60 second analysis time per filter.



Limits of Detection in ppm (mg/kg)			
Time: 60s per filter			
Mining (2 filters)		Soils (1 filter)	
Element	LOD	Element	LOD
Mg	2600	Ti	900
Al	810	Cr	100
Si	N/A	Mn	45
P	300	Fe	30
S	75	Co	20
Cl	45	Ni	25
K	130	Cu	14
Ca	120	Zn	7
Ti	900	As	4
V	560	Se	3
Cr	160	Rb	2
Mn	115	Sr	3
Fe	80	Zr	10
Co	40	Pd	15
Ni	50	Ag	10
Cu	25	Cd	15
Zn	15	Sn	25
As	10	Sb	20
Se	5	Ba	55
Rb	5	W	25
Sr	5	Au	10
Zr	15	Hg	5
Nb	30	Pb	6
Mo	A/S		
Pd	30		
Ag	A/S		
Cd	60		
Sn	50		
Sb	45		
Ba	75		
W	75		
Pb	15		
Bi	15		

Limits of detection (LODs) are dependent on the following factors:

- Testing time
- Interferences/matrix
- Level of statistical confidence
- Line overlaps

Please note:

Ongoing research and advancements in our Niton XL2 Plus analyzers will lead to continual improvement in many of the values detailed in this chart. Contact a Thermo Fisher Scientific office or your local representative for the latest performance specifications.

Actual analysis time is based on your requirements. In most cases, shorter times will provide you with the detection limits required. For example, if analysis time is reduced from 60 seconds per filter to 15 seconds per filter, then the detection limits obtained would be twice the values shown in the chart. Similarly, increasing the time of analysis will reduce the detection limits by the square root of the increased time.



1. Definition and Procedure for the Determination of the Method of Detection Limit, 40 CFR, Part 136, Appendix B, Revision 1.11 U.S. Environmental Protection Agency. U.S. Government Printing Office, Washington, DC, 1995.

Values detailed above are preliminary and subject to change. A/S= Application Specific N/A = Not Applicable

Learn more at thermofisher.com/XL2Plus

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