Thermo Scientific Niton XL3t GOLDD+ Series Environmental Analyzers

Elemental Limits of Detection in SiO_2 and SRM Matrices Using Soil Analysis

The Niton® XL3t GOLDD+ Series x-ray fluorescence (XRF) analyzer is the ultimate choice in features and performance. The chart below details the sensitivity, or LODs[1], of the Niton XL3t GOLDD+ using Soil Analysis Mode for an SiO_2 matrix, a typical soil matrix (SiO_2 with Ca/Fe), and SRM matrix.

Limits of Detection in ppm (mg/kg)

	Time	60s per filter		
	Matrix	SiO_2	SiO_2+Fe+Ca	SRM
Elements	Mo	3	3	3
	Zr	3	4	7
	Sr	3	3	7
	U	5	4	7
	Rb	3	3	5
	Th	4	4	5
	Pb	5	8	8
	Se	3	4	4
	As	4	7	7
	Hg	6	9	9
	Au	7	9	9
	Zn	7	10	12
	W	20	30	30
	Cu	10	13	15
	Ni	25	30	30
	Co	20	90	90
	Fe	25	N/A	N/A
	Mn	35	50	65
	Cr	10	22	30
	V	10	25	60
	Ti	20	60	150
	Sc	10	75	80
	Ca	40	N/A	N/A
	K	45	150	N/A
	S	75	275	350
	Ba	35	45	45
	Cs	30	35	35
	Te	30	35	35
	Sb	15	20	20
	Sn	15	20	20
	Cd	10	12	12
	Ag	A/S	A/S	A/S
	Pd	10	12	12

Element list shown is not exhaustive. For limits of detection for elements not shown, please contact a Thermo Fisher Scientific office or your local representative.

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

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

LODs are calculated as three standard deviations (99.7% confidence interval) for each element, using 60-second analysis times per filter.

Please Note:
Ongoing research and advancements in our Niton XL3t GOLDD+ Series 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, and, in most cases, shorter times will give you the detection limits you require. For example, if analysis time was reduced from 60 seconds/filter to 15 seconds/filter, then the detection limits obtained would be twice the values shown in the chart. Similarly, increasing the analysis time will reduce the detection limits by the square root of the increased time.

A/S = Application-specific
N/A = Not applicable

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.

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Thermo Scientific Niton XL3t GOLDD+ Series Mining Analyzers

Elemental Limits of Detection in SiO_2 and SRM Matrices Using Mining Analysis

The Niton® XL3t GOLDD+ Series x-ray fluorescence (XRF)analyzer is the ultimate choice in features and performance. The chart below details the sensitivity, or LODs[1], of the Niton XL2 GOLDD+ Series using mining analysis for an SiO_2 matrix, a typical soil matrix (SiO_2 with Ca/Fe), and SRM matrix.

Limits of Detection in ppm (mg/kg)

	Time	60s per filter w/out He					
	Matrix	SiO_2		SiO_2+Fe+Ca		SRM	
Elements	Ba	35		40		45	
	Sb	12		15		15	
	Sn	15		18		20	
	Cd	8		10		10	
	Pd	5		5		5	
	Ag	A/S		A/S		A/S	
	Mo	3		3		3	
	Nb	3		3		3	
	Zr	3		3		5	
	Sr	3		3		5	
	Rb	3		3		3	
	Bi	3		5		5	
	As	3		5		5	
	Se	3		3		3	
	Au	16		20		20	
	Pb	5		10		10	
	W	40		60		60	
	Zn	8		15		15	
	Cu	12		15		15	
	Ni	25		30		30	
	Co	20		100		100	
	Fe	35		N/A		N/A	
	Mn	60		65		85	
	Cr	20		30		35	
	V	10		20		35	
	Ti	10		20		60	
	Ca	50		N/A		N/A	
	K	40		N/A		N/A	
	Cl	60	50*	80	65*	75	65*
	S	70	55*	90	75*	125	90*
	P	250	200*	400	330*	300	230*
	Si	N/A	N/A*	N/A	N/A*	N/A	N/A*
	Al	500	220*	1000	500*	2500	1000*
	Mg	3500	750*	6000	1500*	6500	2000*

Element list shown is not exhaustive. For limits of detection for elements not shown, please contact a Thermo Fisher Scientific office or your local representative.

*LODs displayed with the use of helium.

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

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

LODs are calculated as three standard deviations (99.7% confidence interval) for each element, using 60-second analysis times per filter.

Please Note:
Ongoing research and advancements in our Niton XL3t GOLDD+ Series 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, and, in most cases, shorter times will give you the detection limits you require. For example, if analysis time was reduced from 60 seconds/filter to 15 seconds/filter, then the detection limits obtained would be twice the values shown in the chart. Similarly, increasing the analysis time will reduce the detection limits by the square root of the increased time.

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