Low limits, high standards

Elemental limits of detection

The Thermo Scientific™ Niton™ XL5 handheld XRF analyzer is built for your most demanding applications. Where low detection limits and high sample throughput are critical, the Niton XL5's combination of hardware and software provide you with solutions to meet your most difficult analytical requirements.

The chart below details the typical sensitivity, or limits of detection (LODs)[1] of the Niton XL5 in parts per million (PPM) for various elements in aluminum (Al), titanium (Ti), iron (Fe), and copper (Cu) base metals. LODs are calculated as three standard deviations (99.7% confidence interval) for each element, using 60-second analysis times per filter.

Limits of Detection in ppm (mg/kg)
Time: 60s per filter

Element	Al base Metal	Ti base Metal	Fe base Metal	Cu base Metal
Bi	5	10	24	25
Pb	5	10	20	26
Te	15	25	60	120
Sb	11	20	45	80
Sn	8	25	45	60
Cd	8	20	40	65
Ag	10	25	45	80
Pd	10	20	45	65
Ru	5	6	10	18
Mo	5	5	6	12
Nb	5	5	6	10
Zr	5	5	5	15
Y	5	5	5	10
Se	5	10	10	40
Zn	5	15	27	250
Cu	10	25	55	N/A
Ni	15	40	250	120
Co	22	50	550	140
Fe	45	120	N/A	150
Mn	80	180	170	180
Cr	20	300	22	25
V	12	800	18	25
Ti	10	N/A	18	25
S	N/A	N/A	50	N/A
P	N/A	N/A	50	100
Si	220	300	130	200
Al	N/A	1000	500	700
Mg	3000	N/A	N/A	N/A

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

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

Please note:

Ongoing research and advancements in our Niton XL5 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 to 15 seconds, 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.

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.

Learn more at **thermofisher.com/XL5**

Americas
Boston, USA
+1.978.670.7460
niton@thermofisher.com

Europe, Middle East, Africa
Munich, Germany
+49.89.3681380
niton.eur@thermofisher.com

India
Mumbai, India
+91.226.6803000
ininfo@thermofisher.com

Asia Pacific
New Territories, Hong Kong
+852.2885.4613
niton.asia@thermofisher.com

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