

## X-5000 Portable XRF Analyzer

LODs, reported in PPM unless otherwise noted, are optimal.

Element of Interest	X-5000
	3-Beam Soil
	Ta Tube, SDD
Mg	Not Available
Al	1.40%
Si	0.50%
P	380
S	90
Cl	33
K	18
Ca	17
Ti	2
Cr	2
V	1
Mn	2
Fe	4
Ni	4
Cu	3
Zn	2
As	2
Se	1
Rb	1
U	2
Sr	1
Zr	1
Th	2
Mo	1
Ag	1
Cd	2
Sn	3
Sb	4
Ba	20
Hg	3
Pb	2
La	30
Ce	45
Pr	75
Nd	90
Pm	130
Sm	150

Measurements were taken in air for 120 seconds per beam.

Standards used were in a clean, homogenous SiO<sub>2</sub> matrix without interfering elements.



**NOTE:**

Common, well-known inter-element interferences for environmental real-world soil samples are as follows:

- » High levels of Fe can interfere with measurements of low levels of Cr
- » High levels of Pb can interfere measurements of with low levels of As

The determination of detection limits for all methods of analysis depend on numerous factors including the instrumentation and its settings, the standards that are utilized to determine the limits of detection, and the actual working samples analyzed.

The LOD's reported here are based on the X-5000 portable XRF analyzer with a large area SDD; automatically selected kV-uA-Filter settings; SiO<sub>2</sub> blank measurements; Compton normalization; 120 seconds measurement time; standards that are pure elemental oxides, and NIST standards with some common soil matrices. All measurements were done in air.

These parameters allow the determination of the best LOD's for the X-5000 being calibrated. Actual working samples may contain interfering elements that the hardware settings or selection of analyte lines do not correct for; therefore, the actual working LOD's for "real-world" samples may be higher than those determined with the interference-free standards.

Limits of Detection for portable XRF instrumentation are typically determined using well defined and easily reproduced parameters:

**Optimized hardware settings**

- » X-ray tube target material
- » Power (kV, uA)
- » Filters
- » Background subtraction and/or normalization

**Measurement times**

- » 60 to 120 seconds depending on the element of interest

**Interference-free standards**

- » Standards used to determine instrumentation detection limits typically do not contain anything that introduces other variables, such as interfering elements, unless the hardware settings used eliminate or significantly reduce the interference.

LIMITS OF DETECTION

For Mg analysis, please contact your local Olympus Innov-X representative. The X-5000 is available with alternative x-ray tube options for light element optimized analysis.