

User-defined calibrations with Niton XL5 Plus user mode

The Thermo Scientific™ Niton™ XL5 Plus Handheld XRF Analyzer (shown in Figure 1) features a software function called **User Mode**, designed for experienced users who need to create their own calibrations.



Figure 1. Niton XL5 Plus analyzer.

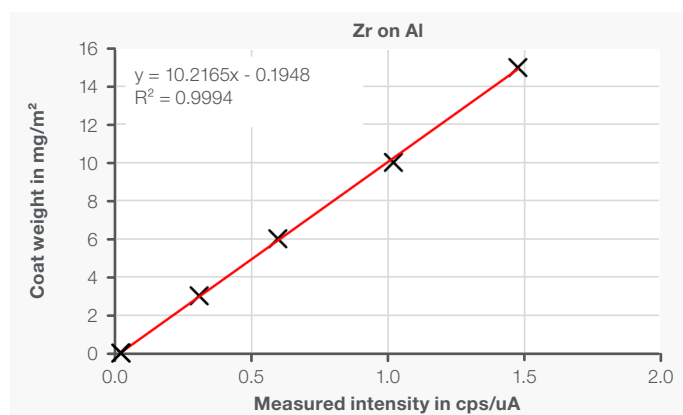


Figure 2. Calibration curve for Zr coatings on Al substrates.

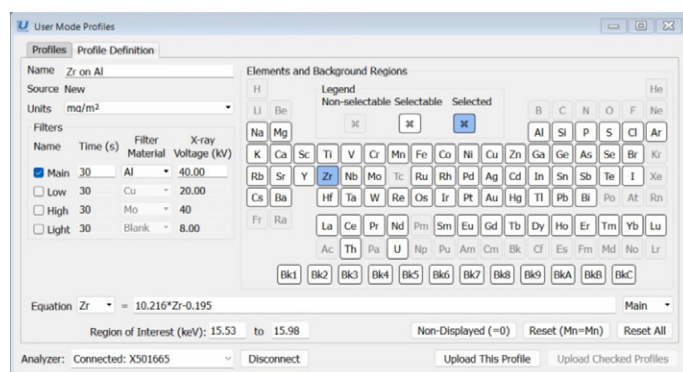


Figure 3. User Mode development interface.

User Mode has been developed to provide maximum flexibility for performing empirical calibrations. It allows the user to specify certain parameters and to proceed with analytical method development:

- Define and select optimal beam conditions, including filter material and voltage*, while the current is dynamically adjusted to the maximum value.
- Select elements and regions of interest from Na to U.
- Select up to 12 background regions to perform background correction, background subtraction, or Compton normalization.
- Select units of measurement for bulk concentrations, coat weight, and coating thickness.
- Acquire normalized count rates for all selected regions of interest.
- Construct calibration curves and apply mathematical fitting (Figure 2).
- Manually enter calibration model equations for selected analytes as a function of element and background region intensities.
- Validate the calibration model.
- Analyze unknown samples.

User Mode on the Niton XL5 Plus analyzer also includes instrument GUI features that allow users to define the number of readings to average, customize the display of analytes, and create pseudo-elements (for example, for element-to-oxide conversions or for calculating parameters such as sums or ratios derived from analytical results).

User Mode can be deployed across a wide range of applications, including QA/QC workflows and the analysis of coated materials, glass, and liquids, as well as corporate and academic research focused on developing empirical calibrations to address complex analytical challenges.

The Niton XL5 Plus User Mode software is intuitive to use while offering a high degree of flexibility (see Figure 3) for users who want to optimize measurement conditions and create application-specific calibration models that deliver accurate quantitative results for non-standard applications.

*Depending on the selected filter; the voltage cannot exceed certain values, to keep leakage radiation low.