Analytical capability of the Thermo Scientific™ Niton™ XL3t GOLDD+ XRF analyzer

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The research seeks to assess the capability of the XL3t GOLDD+ 950 Thermo Scientific Niton portable X-ray fluorescence analyzer (pXRF) to determine specific elements (As, Cu, Fe, Mn, Nb, Sr, Ti, W, and Zr). The research focuses on the analysis of certified reference materials (CRMs) to establish the figures of merit, primarily the accuracy and the precision of the XL3t GOLDD+ 950 Thermo Scientific Niton analyzer. Additionally, the efficacy of the instrument is evaluated using x-y plots of mean pXRF results versus known certified values of the CRMs. The correlation coefficients (r2) and slopes are deduced. The XL3t GOLDD+ 950 Thermo Scientific Niton pXRF is used to carry out replicate analyses (n = 10) of nine CRMs (Till1, Till2, Till3, Till4, NIST2704, NIST2780, DGPM-1, USGS SdAR-M2 and MP-1b-966), with varying matrix compositions. Default factory calibration and TestAllGeo mode is utilized. Excellent agreement between pXRF and CRM values is demonstrated by perfect correlation coefficients of r2 values ranging from 0.9608 to 1.0000 for all elements of interest. Similarly, slope values are excellent for all elements of interest having values between 0.8931 and 1.1449. Further pXRF research should address additional elements and calibration corrections should be applied to the Sandamap powdered pegmatite samples data to establish the analytical capability of the instrument in more detail.