

# **SCREENING AND ANALYSIS OF GEOCHEMICAL DATA OBTAINED BY PORTABLE X-RAY FLUORESCENCE TECHNIQUE IN WEATHERED DIORITE PROFILE**

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## **Abstract**

Portable X-ray fluorescence analysis (pXRF) is the irreplaceable technique to obtain in-situ geochemical composition in field. The pXRF with superiorities of rapid, in-situ nature, non-destructive, and multi-element analysis has a great potential to be applied to study geological process in scales of hand specimen, ore body, small region etc. However, limited precision of analysis provided by pXRF may be concerned in support quantitative analysis. In this paper, the quality of data obtained by pXRF are evaluated and compared with element concentration obtained by other lab-based techniques. The study indicates that the accuracy of reading numbers by pXRF was generally affected by the absolute element concentration in sample. The correctness and precision of reading numbers are low when concentration of element is less than about tenfold limit of detection (LOD), but the correctness approach gradually to 1 as concentration increases. Based on the above findings, a quantitative data screening solution on the reading numbers was proposed. The application of pXRF in-situ analysis and quantitative data screening solution to weathered diorite profile has indicated that the data obtained by pXRF can characterize the relative degree of gain or loss of element concentration in the process of weathering. Therefore, pXRF can be used as an effective tool for quantitative trend analysis of geological process and for rapid detection of geochemical anomalies in geochemical exploration.