Importance of sample prepartion in handheld XRF technique: examples from Madero Pb-Zn (Mexico) and Carmax Cu-Mo (Canada) deposits

ALIREZA SOMARIN

Thermo Fisher Scientific, Tewksbury, MA 01876
alireza.somarin@thermofisher.com

Introduction

X-ray florescence (XRF) is described as a surface technique because of minimal beam penetration. As a result, a flat finely disseminated and homogeneous sample is preferred for XRF analysis. This explains the routine procedure to prepare samples in any laboratory analysis. However, most handheld XRF (HHXRF) users prefer to save time and not to prepare samples. This study compares lab results with HHXRF assays of prepared and unprepared samples from two deposits.

Results and Conclusion

The Madero is a Zn–Cu–Pb–(Ag) deposit, Mexico, consists of several mineralized zones which contain two types of sulfide assemblages: Pb-Zn and Cu-Ag. The deposit is hosted by the Mesozoic marine sedimentary rocks suggesting a sedimentary exhalative (SEDEX) or volcanogenic (VMS) origin with some skarn reactions which formed calc-silicates and replacement textures. 333 drill core samples were analyzed by both lab (ICP) and Thermo Scientific Niton XL3t-950 GOLDD handheld analyzer. The results show great improvement by sample preparation. For example, Zn correlation with lab data jumps from 72.25% in the unprepared samples to 96.36% in the prepared samples (Fig. 1). Similar results were obtained from the Carmax Cu-Mo porphyry deposit, Canada.

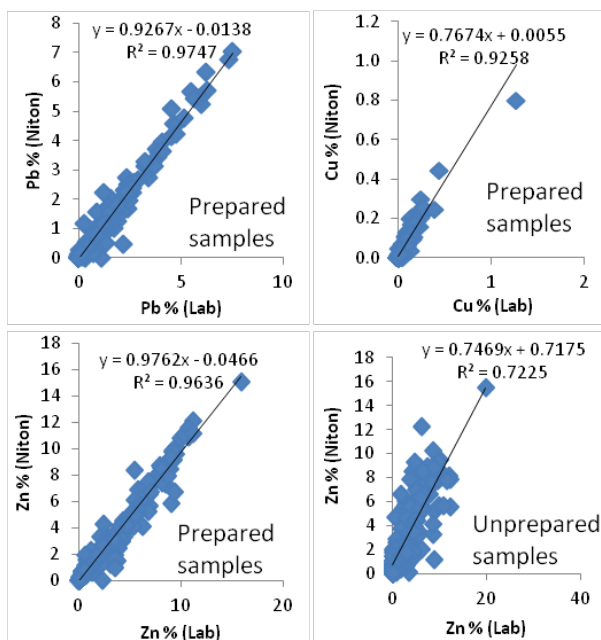**Figure 1:** Correlation between lab and HHXRF data for Cu, Pb and Zn (prepared and unprepared samples) from the Madero Pb-Zn deposit.