

Press Release

Rigaku WDXRF Application: Determination of Metals in Copper Concentrate by Advanced Correction Method for Fused Beads

The Woodlands, TX – February 12, 2013. Rigaku Corporation is pleased to announce the publication of a new application report introducing an advanced correction technique for the fusion method and its application for copper concentrate analysis. Application Note XRF5027 describes the analysis of copper ore concentrate, with complete information about sample preparation, method calibration and repeatability. The new correction method is a convenient and easy-to-use universal technique that rectifies potential errors in the fusion method.

Copper is one of the important base metals in the development of modern nations and plays a significant role as an essential industrial material for construction, electronics, machinery and transportation. Global copper consumption has grown in recent decades, and mining and processing efforts have increased to keep up with demand.

Copper ore and copper concentrate contain a variety of minor elements that, though valuable as byproducts, are detrimental to quality in copper metal products and hazardous to the environment and human health. Therefore, rapid and accurate determination of various metals in major and trace amounts in copper ore and concentrate is important for process control in both beneficiation and smelting. X-ray fluorescence spectrometry is regarded as the best rapid, high precision analysis method to monitor ore grade copper and impurities.

For this analysis, twelve certified reference materials of copper ores and concentrates were used as references for calibration. Measurements were performed for sixteen elements using the Rigaku ZSX Primus III+ spectrometer. The ZSX Primus III+ is a floor-standing sequential wavelength dispersive X-ray fluorescence (WDXRF) spectrometer that offers high spectral resolution and high sensitivity for light elements. The instrument is designed to provide reliable analysis results for applications that require high precision, such as the analysis of alloys.

The fusion method is an effective sample preparation technique for accurate analysis of a wide variety of powder samples, including minerals and ores, by XRF spectrometry. Samples are prepared as fused beads, thus eliminating heterogeneity due to grain size effects and mineralogical composition. During the calibration, all of the elements were treated as oxides. Correction coefficients applied to the matrix correction in the calibration were theoretically calculated by the built-in Fundamental Parameter (FP) software. In order to take advantage of the fusion method, however, appropriate corrections for errors resulting from fusion processes are required. Possible errors in the fusion process are: weighing inaccuracies, loss on ignition (LOI), gain on ignition (GOI), decomposition of oxidizing agents and evaporation of flux. The results demonstrate that the fusion method can be successfully employed for the analysis of copper concentrate.

Request a copy of the report: <http://www.rigaku.com/products/xrf/primus3/app5027>

About Rigaku

Since its inception in Japan in 1951, Rigaku has been at the forefront of analytical and industrial instrumentation technology. Rigaku and its subsidiaries form a global group focused on general-purpose analytical instrumentation and the life sciences. With hundreds of major innovations to their credit, Rigaku companies are world leaders in X-ray spectrometry, diffraction, and optics, as well as small molecule and protein crystallography and semiconductor metrology. Today, Rigaku employs over 1,100 people in the manufacturing and support of its analytical equipment, which is used in more than 70 countries around the world supporting research, development, and quality assurance activities. Throughout the world, Rigaku continuously promotes partnerships, dialog, and innovation within the global scientific and industrial communities.

For further information, contact:

Laura Oelofse
XRF Product Marketing Manager
Rigaku Corporation
(281) 362-2300 | info@rigaku.com
www.rigaku.com



**Rigaku ZSX Primus III+
WDXRF Spectrometer**