

Press Release

Rigaku Publishes New Method for Fused Bead Analysis of Various Oxide Materials for Wide Concentration Ranges on Benchtop WDXRF

May 28, 2015 – The Woodlands, Texas. [Rigaku Corporation](#) today announced the publication of a new X-ray fluorescence (XRF) technique for the analysis of a variety of oxides using the fusion method. Rigaku Application Note XRF 1048 demonstrates the establishment of a single calibration for diverse materials, such as minerals, ores and refractories, by the fusion method.

The report demonstrates the performance of the [Rigaku Supermini200](#) analyzer, a benchtop wavelength-dispersive (WD) XRF spectrometer. The Supermini200 WDXRF spectrometer is designed to minimize the peripherals needed for installation, such as cooling water, power supply, and installation area, and has optimal sensitivity for light elements.

The fusion method in XRF analysis is an effective sample preparation technique that eliminates heterogeneity due to grain size and mineralogical differences, thereby enabling more precise analysis results for powder samples. When using the technique in XRF analysis of minerals, ores and refractories, it is necessary to apply different fusion conditions, such as dilution ratio, or oxidizing agent, due to differences in the optimum conditions for each material.

Some samples may have crystal water or carbonate, which results in loss on ignition (LOI); while others gain on ignition (GOI). “Fusion Bead Correction”, an optional program for the software mounted on the Supermini200, can apply correction for error factors in the fusion method.

The certified reference materials used in this experiment are listed in the report. The samples were fused on a Rigaku benchtop high-frequency fusion machine. To expand the calibration range, reagents were used to make synthetic fused beads for some components.

Each fused bead was measured under vacuum on the Supermini200 benchtop WDXRF spectrometer, which was equipped with an end-window Pd-target 200 W X-ray tube, operating at 50 kV and 4.0 mA, with a measurement area 30 mm in diameter. The counting time for each element was 20 seconds each for peak and background. The total



**Rigaku Supermini200
wavelength dispersive X-Ray
fluorescence Spectrometer**

measurement time for the analysis of the 15 components per sample was approximately 12 minutes.

The calibration results show that excellent precision was obtained for each and all of the analytes, even though various standard materials and additional synthetic standards were used for making the calibration curves.

The results demonstrate that the fusion method and the corrections for LOI/GOI and dilution ratio of flux and oxidizing agent enable a single calibration with a wide range of concentration for diverse materials, such as natural minerals and ores. Additionally, the application report shows that it is possible to extend the calibration range by the use of a single agent to make a synthetic standard fused bead.

A copy of this report may be requested at
<http://www.rigaku.com/products/xrf/supermini/app1048>.

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.

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