

Press Release

Cement Analysis by the Pressed Powder Method on the ZSX Primus III+ According to ASTM C114-11

The Woodlands, TX – December 27, 2012. Rigaku Corporation today announced a new empirical method for the analysis of cement by the pressed powder method using wavelength dispersive X-ray fluorescence spectrometry (WDXRF). Application Note #5005 describes the capabilities of the ZSX Primus III+ WDXRF spectrometer for the quantitative analysis of Portland cement by the pressed powder method, in accordance with the American Society for Testing and Materials method ASTM C114-11, which covers chemical analysis of hydraulic cement. The application note details sample preparation, method calibration and repeatability.

Cement is an essential material for use in construction, and Portland cement is the most common type of cement in general use around the world. Different kinds of hydraulic cements, including Portland cement, have varying physical properties and are produced by changing the composition of clinker minerals. It is therefore critical to control the chemical composition of cement and interim products.

XRF spectrometry is commonly used for chemical composition analysis of cement because the sample preparation is comparatively simple relative to other analytical methods. For the analysis described in the report, cement powder samples were pulverized in a tungsten carbide container with n-hexane for three minutes. 4.5 grams of the resultant powders, pre-dried, were then pressed at 150 kN. Measurements were performed in vacuum on the ZSX Primus III+, a high performance tube-above WDXRF spectrometer optimized for rapid quantitative elemental analysis.

The qualification test demonstrated that the test results on the ZSX Primus III+, using pressed powder briquettes of wet-ground samples, meet the requirements for analysis of hydraulic cement defined in ASTM C114-11. The precision obtained by the repeatability test exceeded the defined required values, enabling use of much shorter counting time to qualify for the ASTM C114-11 standard when higher throughput is required.

The results of the quantitative analyses confirm that the method demonstrated in the application note meets the requirements described in ASTM C114-11, and that hydraulic cement samples can be routinely analyzed with simple sample preparation and high accuracy and precision on the ZSX Primus III+ by the pressed pellet method,

A copy of this application report may be requested on Rigaku's official website at <http://www.rigaku.com/products/xrf/primus3/app5005>

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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