

Press Release

Rigaku NEX QC+ EDXRF: Major Oxides in Finished Cement

Austin, TX – June 11, 2013. Applied Rigaku Technologies, Inc. today announced a new empirical method for the analysis of finished cement. Application Note #1273 demonstrates the capabilities of the [Rigaku NEX QC+](#) energy dispersive X-ray fluorescence (EDXRF) spectrometer for quality control during the cement production process. The report includes complete information regarding sample preparation, method calibration and repeatability.

Portland cement is the most common type of cement in general use worldwide and is a basic ingredient of concrete, mortar, stucco and most non-specialty grout. X-ray fluorescence (XRF) spectroscopy is an established technique used in cement plants around the world for quality control (QA/QC) throughout the manufacturing process. During the entire production and processing cycle, oxide composition of the cement material must be reliably monitored to ensure optimal process control, monitor physical characteristics of the cement and enable profitability.

EDXRF spectrometry is a regularly employed screening and quality control tool used to ensure proper composition of incoming feedstocks and raw meal mixture balances during the addition of gypsum and throughout the manufacturing process. Cement plants also routinely maintain EDXRF analyzers for backup to carry out basic measurements when the main WDXRF system is in use or undergoing maintenance..

For the published method, each sample is prepared by grinding the material to a fine, dry, homogeneous powder and producing a 5 gram hydraulically pressed pellet using 20 tons pressure for 30 seconds. Empirical calibrations were built using a set of 8 NIST certified SRMs. Using the empirical approach, "alpha corrections" are then employed to automatically compensate for variations in X-ray absorption and enhancement effects within the sample due to the independent variations in element concentration, thereby yielding an accurate model characterizing the cement type.

Analysis was carried out using the new Rigaku NEX QC+ high resolution benchtop EDXRF analyzer. The NEX QC+ spectrometer employs next generation silicon detector technology and is specifically designed for routine quality control applications. It is engineered to deliver superior calibrations and has the necessary precision for the most challenging measurements.

The results show that the Rigaku NEX QC+ analyzer's rapid quantitative elemental analysis capabilities can provide cement plants with a reliable and rugged system for quality control measurements, even for more demanding applications where analysis time or sample throughput is critical.

A copy of this report may be requested at:

http://www.rigakuedxrf.com/edxrf/app-notes.html?id=1273_AppNote

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 life sciences and general purpose analytical instrumentation. With hundreds of major innovations to its credit, Rigaku and its subsidiary companies are world leaders in the fields of small molecule and protein crystallography, Raman spectroscopy, X-ray spectrometry and diffraction, X-ray optics, as well as semiconductor metrology. Rigaku employs over 1,100 people globally and its products are in use in more than 70 countries – supporting research, development, production control and quality assurance activities. Throughout the world, Rigaku continuously promotes partnerships, dialog, and innovation within the global scientific and industrial community.

For further information, contact:

Scott Fess
Product Manager
Applied Rigaku Technologies, Inc.
tel: +1. 512-225-1796
info@RigakuEDXRF.com

Applied Rigaku Technologies, Inc. • 9825 Spectrum Drive, Bldg. 4, Suite 475 • Austin, TX 78717 • US Toll Free: 1-877-55E-DXRF (1-877-553-3973)

T: 512-225-1796 • F: 512-225-1797 • I: info@rigakuedxrf.com

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