Press Release

Rigaku Publishes Method for Quantitative Analysis of Ferrosilicon by WDXRF

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A new application report from Rigaku describes the analysis of ferrosilicon by WDXRF *using the fusion bead correction function, which corrects for the effects of loss or gain on ignition*

January 15, 2016 – The Woodlands, Texas. Rigaku Corporation has published an application report describing accurate ferrosilicon analysis by wavelength dispersive X-ray fluorescence (WDXRF). Application Note XRF1026 demonstrates ferrosilicon analysis using the Rigaku ZSX Primus III+ WDXRF spectrometer, which is optimized for process control of steel making and ferrosilicon production. The report covers sample preparation, method calibration and repeatability.

Iron alloys with 15% to 90% silicon content are known as "ferrosilicon." They are used to reduce metals from their oxides and to deoxidize steel and other ferrous alloys, thereby preventing loss of carbon from the molten steel. Analyses of ferrosilicon, as well as of slag and raw materials, are required in the control of the steel making process. X-ray fluorescence is the most common method for analyzing ferroalloy, slag, steel and added materials due to its rapid analysis capabilities, as well as its ability to measure both bulk metal and powders.

The metallic elements in ferrosilicon would be converted to oxides using conventional bead fusion methods, so a special fusion technique was developed for this method. Measurements were performed using the ZSX Primus III+ spectrometer with a 3 kW Rh target X-ray tube. The analyzer features tube-above optics, where the X-ray tube is located above the sample, reducing the risk of instrument contamination or damage. The ZSX Primus III+ spectrometer is ideal for iron and steel making process control, including for cast iron and alloy steels, where both bulk metal and powder samples are analyzed as part of the process control protocol.

The system software is based on Rigaku's flowbar interface, which leads the user through a series of procedures step by step and provides various statistical process control functions ideally suited to the steel industry. The software has a fusion bead correction function that can accommodate differences in weight ratio among sample, flux and oxidation reagent, loss and gain on ignition and inter-element effects.

The results confirm that ferrosilicon with wide ranges of composition can be properly analyzed by the fusion method using the fusion bead correction function, and that very precise analysis of the elements in ferrosilicon can be rapidly performed using the ZSX Primus III+ spectrometer. It is also possible to analyze other ferroalloys, steels and powders, such as slag, with excellent precision.

A copy of this application report may be requested on Rigaku's official website at http://www.rigaku.com/en/products/xrf/appnotes?id=XRF_1026

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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