

Press Release

Quantitative Analysis of Stainless Steel Using the ZSX Primus III+

The Woodlands, TX – January 24, 2013. Rigaku Corporation is pleased to announce the publication of a new application report describing stainless steel analysis using wavelength dispersive X-ray fluorescence (WDXRF) spectrometry. The report highlights the performance of the Rigaku ZSX Primus III+ WDXRF spectrometer, which is optimized for process control. Application Note #5021 details the analysis of alloy steels with added chromium alloying elements, and includes complete information regarding sample preparation, method calibration and repeatability.

Stainless steel does not rust or corrode as readily as ordinary steel. There are over 150 grades of stainless steel, which have numerous applications including use in cookware and major appliances. Alloy steels are typically produced using electric furnaces and the concentrations of elements in the molten steel are controlled during the steel making process. Therefore, quick and accurate analyses of elemental compositions are necessary, as are analyses of slag and raw materials such as quicklime and ferroalloys. X-ray fluorescence spectrometers are the most common instruments for the analysis of steel due to their rapid analysis capabilities and the ability to measure both bulk metal and powders.

Certified standard reference materials of stainless steel provided by Japan Steel Standard were used to establish the calibration. Measurements were performed using the ZSX Primus III+ WDXRF analyzer with a 3 kW Rh target X-ray tube.

The ZSX Primus III+ spectrometer has tube-above optics, which means that the X-ray tube is located above the sample to reduce the risk of instrument contamination or damage. It is ideal for the steel industry, where both bulk metals and powder samples are analyzed. The system software, based on Rigaku's flowbar interface, leads the user through a series of step-by-step procedures to execute and optimize measurements.

The results of this study demonstrate that accurate analysis of the elements in stainless steel, particularly nickel (Ni) and chromium (Cr), can be performed using the ZSX Primus III+ spectrometer with high precision. Other high alloy steels, as well as low alloy steel, powder slag and powder raw materials, can also be analyzed with exceptional precision using the ZSX Primus III+ spectrometer, which is shown to be ideally suited for process control in stainless steel plants.

A copy of this report may be requested at http://www.rigaku.com/products/xrf/appnotes?id=XRF_5021.

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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