Press Release

Determination of Sulfur in Bio-gasoline using the Primini Biofuel

The Woodlands, TX – January 29, 2013. Rigaku Corporation today announced the publication of a new application note covering the determination of sulfur in bio-gasoline using wavelength dispersive X-ray fluorescence (WDXRF) spectrometry. The report describes the performance of the Rigaku Primini Biofuel WDXRF spectrometer, a benchtop analyzer dedicated to trace analysis of phosphorus (P), sulfur (S) and chlorine (Cl).

The sulfur content in gasoline has been restricted in the interest of environmental protection, as well as for increased engine performance and emission control. At the same time, use of non-fossil fuels such as bio-ethanol and bio-diesel has increased. There are two means of producing bio-gasoline. One is to add ETBE (ethyl tert-butyl ether), synthesized from ethanol and isobutene, and the other is to directly add ethanol to gasoline.

In X-ray fluorescence analysis, the different additive ratios of ETBE or ethanol influence the results for sulfur levels due to variations in oxygen content in bio-gasoline. Application note #5031 introduces a new method that has been developed to correct for these conditions using scattering X-rays from samples.

For the published method, the standard and unknown samples were prepared by blending di-n-butyl disulfide with paraffinic oil and alcohol. To calibrate for sulfur, a newly developed “Lite Matrix Correction” method was applied. This method only requires standards for elements to be analyzed, and does not require any special standards for matrix correction.

Analysis was performed using the Rigaku Primini Biofuel spectrometer equipped with a 50 W air cooled Pd target X-ray tube, which does not require external cooling water. The system employed a sealed proportional counter detector and a He-purge measurement environment.

The results detailed in the report demonstrated that the Primini Biofuel benchtop WDXRF spectrometer can deliver accurate determination of sulfur in bio-gasoline without regard to variation of oxygen and ETBE contents. Using the optional “Lite Matrix Correction” function, accurate determination of sulfur can be performed for gasolines with a variety of C/H ratios and oxygen content.

A copy of this application report may be requested on Rigaku’s official website at http://www.rigaku.com/products/xrf/appnotes?id=XRF_5031.

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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