



MAY 2021, ISSUE 95

WELCOME

The mining industry, which contributes around [four to seven percent](#) of global CO₂ emissions, has been under pressure to achieve carbon-neutral processes within a matter of years. On the other hand, the ever-increasing need for rare earth metals to support the green movement away from carbon-based fuels towards electronics such as electric storage and vehicle [batteries](#) makes achieving carbon neutrality a huge feat. Mining for these rarer, less abundant metals such as platinum, cobalt and neodymium has a [large environmental cost](#).

Assisting the process of achieving carbon neutrality falls not only to the mining companies, but also to supporting industries and supplies. At Rigaku, we pride ourselves on building robust, hard-working analytical equipment, such as [XRF](#) and [XRD](#) instruments. These are built to last, thereby reducing the need for frequent costly replacement. In addition, the requirement for instrument consumables has been lowered over the years, not simply as a cost-saving exercise to the customer, but with an understanding that these all contribute to the carbon footprint of a system.

UPCOMING RIGAKU WEBINARS

Thermal Analysis Webinar Series Focusing on Food Applications

May 27, 2021 12:30 AM | CDT

In this webinar, we will be showcasing food applications using thermal analysis methods such as STA, DSC and evolved gas analysis.

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Slag Applications in X-ray Fluorescence Analysis

June 2, 2021 7 AM | CDT

During this one-hour complimentary webinar, application specialists from FLUXANA and Rigaku will present the background to sample preparation of slag standards and setting up a fused bead slag calibration with an appropriate drift correction. They will highlight the XRF best operating practices that will ensure the slag fused bead calibration is fit for purpose.

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CT Data Analysis Techniques Using ImageJ

June 16, 2021 1 PM | CDT

A live demonstration of X-ray Computed Tomography (CT) data analysis using ImageJ (an open platform for scientific image analysis). You don't need any commercial software licenses to enjoy this workshop. We will review the basic operations of ImageJ and analyze CT images. All data sets used in the demonstration will be available to the audience. We encourage the participants to download the Fiji distribution of ImageJ and demo data sets and follow the process with us. We will send registrants download links to Fiji installer and datasets before the workshop.

[Read More >](#)

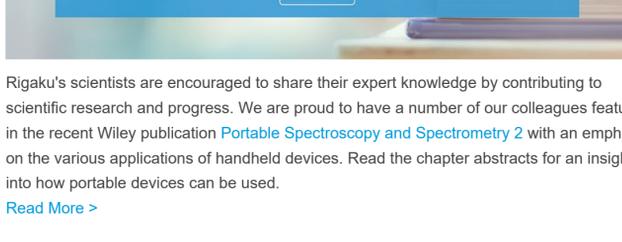
Thermal Analysis Webinar Series Focusing on STA-FTIR Application

June 24, 2021 12:30 AM | CDT

In this webinar, we will be showcasing principles, features, analysis methods, and applications of STA-FTIR. From the characterization of thermal decomposition products of polymers, we will present some examples related to quantitative analysis of specific organic substances evolved during thermal decomposition.

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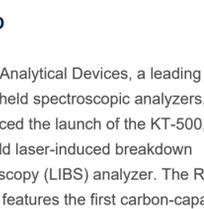
FEATURED JOURNALS & REPORTS



Rigaku's scientists are encouraged to share their expert knowledge by contributing to scientific research and progress. We are proud to have a number of our colleagues featured in the recent Wiley publication [Portable Spectroscopy and Spectrometry 2](#) with an emphasis on the various applications of handheld devices. Read the chapter abstracts for an insight into how portable devices can be used.

[Read More >](#)

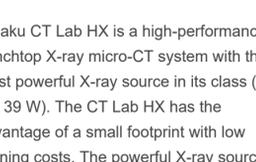
FEATURED PRODUCTS



KT-500

Rigaku Analytical Devices, a leading pioneer of handheld spectroscopic analyzers, has announced the launch of the KT-500, a new, handheld laser-induced breakdown spectrometer (LIBS) analyzer. The Rigaku KT-500 features the first carbon-capable, miniaturized, high-resolution echelle spectrometer, known as HiRES Technology. It represents the next advancement in LIBS technology, with the ability to provide identification of elements such as carbon that were difficult to see with previous-generation handheld LIBS analyzers. The Rigaku KT-500 will be available for demonstration and purchase initially in North America. Global distribution will be available later in the year.

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CT Lab HX

Rigaku CT Lab HX is a high-performance benchtop X-ray micro-CT system with the most powerful X-ray source in its class (130 kV, 39 W). The CT Lab HX has the advantage of a small footprint with low running costs. The powerful X-ray source covers a wide variety of applications, from polymer and bones to electronics and metals, and enables fast data collection at 18 seconds per scan.

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FEATURED APPLICATION NOTES



XRD

In-situ Observation of Structural Changes Accompanying Charging-discharging of Cathode Materials of Lithium Ion Batteries Using a Battery Cell Attachment

Rigaku Corporation

Controlling the state of the charge-discharge process is believed to be crucial for extending the life of lithium ion batteries. Therefore, it is not enough to simply observe the electrode structure in the 100% charged and discharged states, and there is a need to carry out *in-situ* observation of the relationship between depth of discharge, depth of discharge and electrode structure. However, if materials are removed once from sealed batteries, the materials will react with the atmosphere, and the charge-discharge state will change due to peeling of electrodes.

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WDXRF

Sulfur Analysis in Crude Oil and High-Sulfur Fuels by WDXRF According to ASTM D2622-16

Rigaku Corporation

Crude oil is raw material for petroleum products and contains sulfur in concentration from 0.5 mass% to 5.0 mass% typically. Residual fuel oil and high-sulfur diesel fuel are mainly used for boilers and burners, agricultural machines, and long-distance mass transportation means, such as vessels and diesel railroad locomotives equipped with large engines. Sulfur compounds in petroleum cause various harmful influences such as air pollution, metal corrosion and catalyst degradation. Therefore, sulfur concentration of crude oil and high-sulfur fuels is monitored or controlled in refinery and production processes in the petroleum industry.

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EDXRF

Gold Recovery

Applied Rigaku Technologies

Recovering gold and other valuable metals from used ore materials can be a profitable venture. In the processing of ores, the desired metals and other base metals are extracted, leaving mostly silicates, minerals and other base ore materials. Gold and other precious metals can be recovered by further processing and extraction of the ore material from used ore dumps or old tailing piles. To screen and measure the gold content, Applied Rigaku Technologies offers the NEX DE EDXRF system with a high-throughput SDD detector to measure trace valuable metals in various used ore materials.

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FEATURED VIDEO & USEFUL LINK OF THE MONTH



Quasicrystals may aid in non-proliferation efforts

A newly discovered quasicrystal that was created by the first nuclear explosion at Trinity Site, N.M., on July 16, 1945, could someday help scientists better understand illicit nuclear explosions and curb nuclear proliferation.



Rare-earth recycling needs market intervention

Nd-Fe-B permanent magnets are essential for the transition to clean energy and mobility. Given the burgeoning demand for neodymium and other rare earths, we discuss the role of recycling and the need for government intervention in securing a sustainable rare-earth supply.

MATERIALS ANALYSIS IN THE NEWS

April 26, 2021: [Copper Mining Bacteria](#): A More Efficient, Safer Alternative to Sourcing Copper

May 6, 2021: New indicator for [oxygen levels in early oceans](#) developed

May 14, 2021: Battery-powered electric vehicles would be the most impactful in [reducing mining emissions](#)

May 15, 2021: Chemical activation effect on the [mechanical response of mortars](#) based on dune sand

May 19, 2021: Site works start on [pioneer sustainable rare earth separation facility](#) in the U.K.

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