



橋 THE BRIDGE

MATERIALS ANALYSIS eNEWSLETTER

APRIL 2021, ISSUE 94

WELCOME

The ever-evolving automotive industry has always had a symbiotic relationship with scientific and technology research. The desire for faster, more efficient and reliable automotive technology has propelled new fields of exploration but, at the same time, discovery of new materials and improved analytical resources has fed automotive development teams with alternative and innovative options.

For example, lithium-ion **batteries** of viable production quality were first developed in the early 1980s by the now Nobel prize laureate, **Akira Yoshino**, with the aim of powering portable electronics and, at that time, it was difficult to imagine that this technology would also power large, heavy passenger vehicles. The limitations of these batteries for automotive purposes are well understood, which is why there is a plethora of **research activity** into alternative power sources and technology. Rigaku's expert analytical X-ray devices, such as the **SmartLab®**, support the understanding of battery technology using *operando* measurements.

Battery research is not the only driving force behind the automotive industry. **Lubricants and fuels, semiconductor** technology and physical components such as the raw materials in brake pads and tires continue to be developed to advance the industry. Rigaku's analytical expertise is often at the core of these research efforts, providing insights into the physical, chemical and structural properties of materials.

UPCOMING RIGAKU EVENTS

Pharmalytical Summit 2021

May 26, 8 PM | CDT

Pharmalytical Summit 2021 is a one-day educational experience focused on the technology, research and innovation that go into developing pharmaceuticals to help people live longer, healthy lives. The day features presentations and discussions with industry leaders and experts who will share their knowledge and expertise in order to help bring these life-changing products into the world. Join us for a day of education and insights for the pharmaceutical related to the drug development lifecycle.

[Register >](#)

[VIEW MORE](#)

UPCOMING RIGAKU WEBINARS

MicroED: An Update from the Rigaku/JEOL Collaboration

May 25, 9 PM | CDT

We would like to invite you to join us for a special webinar on MicroED. During this event we will show you the latest progress from our collaboration with JEOL.

[Read More >](#)

Thermal Analysis Webinar Series Focusing on Food Applications

May 27, 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.

[Read More >](#)

FEATURED JOURNALS & REPORTS



Journals

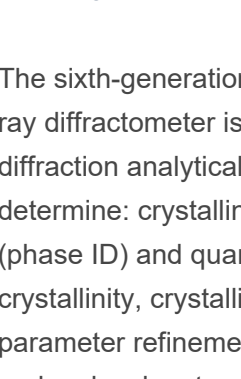
Visualization of fabric fluffiness and dryness: Evaluation of laundry detergents using X-ray computer tomography

By Yukari Sekine, Lion Corporation

For manufacturers who market a wide range of products, including household products, pharmaceuticals and/or nutraceutical products, it is important to communicate the characteristics of their products to consumers. This often requires a good evaluation technique that can show the product characteristics intuitively. X-ray imaging techniques, which can visualize the internal structure of a sample non-destructively, are now widely used in academic, medical, and industrial applications. The combination of X-ray and Computed Tomography (CT), which can re-construct the internal 3-dimensional structure of a sample through numerical computation of the transmission data, is called X-ray CT, which is used in a variety of processes, from R&D to quality inspection.

[Read More >](#)

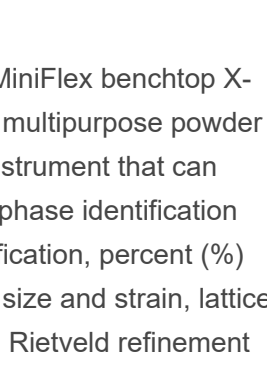
FEATURED PRODUCTS



MiniFlex™

The sixth-generation MiniFlex benchtop X-ray diffractometer is a multipurpose powder diffraction analytical instrument that can determine: crystalline phase identification (phase ID) and quantification, percent (%) crystallinity, crystallite size and strain, lattice parameter refinement, Rietveld refinement and molecular structure.

[Read More >](#)

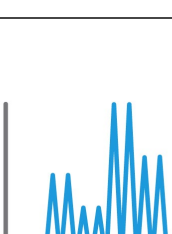


nano3DX

Rigaku's nano3DX is a true X-ray microscope (XRM) with the ability to deliver 3D computed tomography (CT) images of relatively large samples at high resolution. This is accomplished by using a high-powered rotating anode X-ray source and a high-resolution CCD detector. The rotating anode provides for fast data acquisition and the ability to switch anode materials easily to optimize contrast for specific sample types.

[Read More >](#)

FEATURED APPLICATION NOTES



XRD

Phase ID Analysis of Micro-impurities on the Surface of a Tablet by Micro-area XRD Measurement

Rigaku Corporation

Medicines generally consist of an active ingredient (active pharmaceutical ingredient) and diluents for pharmaceutical formulation. The most common form of a drug product is a tablet. If a coloring agent has adhered to the surface of a tablet during the tableting process using a tableting machine, the substance can be analyzed to identify the changes in the tablet's composition and the source of the contamination. In this measurement, we determined the crystal phase of a red-colored material adhering to the surface of a mock tablet and the presumed source of the contamination.

[Read More >](#)



WDXRF

FeO Analysis in Iron Ore Sinters Using the XRD Channel on Multi-Channel XRF Spectrometer Simultix15

Rigaku Corporation

The content of ferrous oxide (FeO) representing divalent iron (Fe²⁺) in sintered iron ore must be controlled to improve the reducibility and control the temperature in blast furnaces in iron production processes. Fe²⁺ in iron ore sinter is typically determined by the titrimetric method. Since samples must be dissolved with acids and the acidic solution of the samples is titrated with potassium dichromate solution, acidic and harmful waste liquid must be disposed of, which is costly and time-consuming.

[Read More >](#)



EDXRF

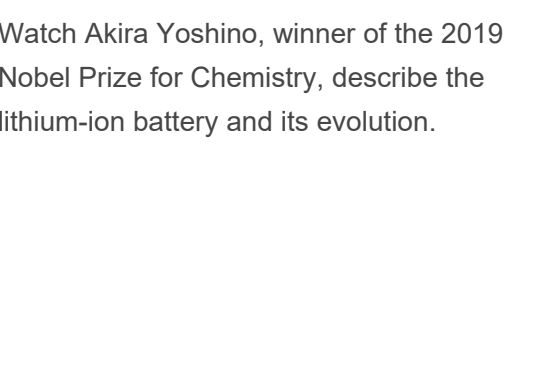
Brake Pads and Raw Material Mixtures

Applied Rigaku Technologies

Brake pads are composed of various binders, abrasives, materials for structure and performance and fillers. Raw materials include many materials including organics, resins, glass, metal chips and metallic compounds, minerals, petroleum coke and ceramics. Raw materials are mixed together in various proportions to obtain desired product specifications and performance and monitoring elemental composition along the mixing and production processes is vital for ensuring optimum product quality and specifications. To meet this industry need, Applied Rigaku Technologies offers NEX CG.

[Read More >](#)

FEATURED VIDEO & USEFUL LINK OF THE MONTH



Akira Yoshino - Lithium-ion battery and its evolution

Watch Akira Yoshino, winner of the 2019 Nobel Prize for Chemistry, describe the lithium-ion battery and its evolution.

scientific reports

Enhanced rate capabilities in a glass-ceramic-derived sodium all-solid-state battery

Researchers from Japan published a paper in Nature describing the enhanced rate capabilities in a glass-ceramic-derived sodium all-solid-state battery.

MATERIALS ANALYSIS IN THE NEWS

March 2, 2021: Microstructural and mechanical evaluation of post-processed SS 316L manufactured by [laser-based powder bed fusion](#).

March 25, 2021: Watch the KT-100S Handheld LIBS analyzer [comparing one alloy to another](#).

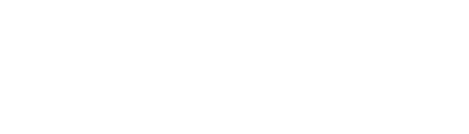
March 26, 2021: This Water Drop, It's the [Greatest Dancer](#).

April 1, 2021: Researchers from Osaka University have developed [sustainable nanocarbon materials made from crab shells](#), which are suitable for use in photosensors and energy storage devices.

April 16, 2021: [Thermoelectric material discovery](#) may deliver new forms of electric power in the future.

April 19, 2021: In certain applications, [hydrogen is a promising contender for a carbon-zero fuel](#). Which countries are leading the race for its implementation?

[Subscribe to Rigaku newsletters!](#)



© 2021 – Rigaku Corporation and its Global Subsidiaries. All Rights Reserved.

9009 New Trails Drive, The Woodlands, TX 77381, United States