



MAY 2022, ISSUE 107

## WELCOME

Do solar panels work at night?

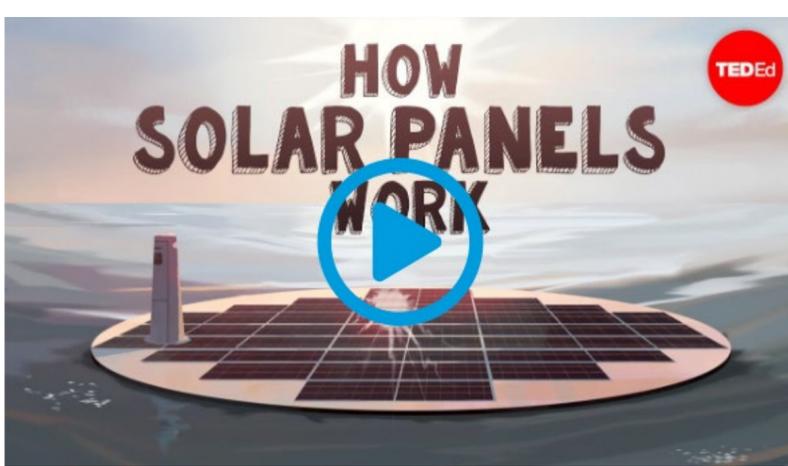
An absurd question to many, but it is one addressed in website FAQ sections of some domestic energy providers supporting solar panels. However, this question may no longer be an unreasonable one:

Last month, scientists at Stanford University reported [a new type of solar cell that uses radiative cooling to utilize the heat emitted as infrared light from the surface of the photovoltaic cell.](#)

Similarly, researchers at UNSW Sydney have proof-of-concept tests on [a device capable of converting infrared heat into electrical power.](#)

With an ever-increasing appetite to harness energy provided to us by our environment, there is a need for the technology to analyze and measure the semiconductor components of solar cells. XRD and XRF techniques, such as those provided by Rigaku, are regularly used to support research and manufacturing of photovoltaics. Rigaku, and the analytical instruments we develop, manufacture and supply, is driven to support cutting-edge research to power these new perspectives.

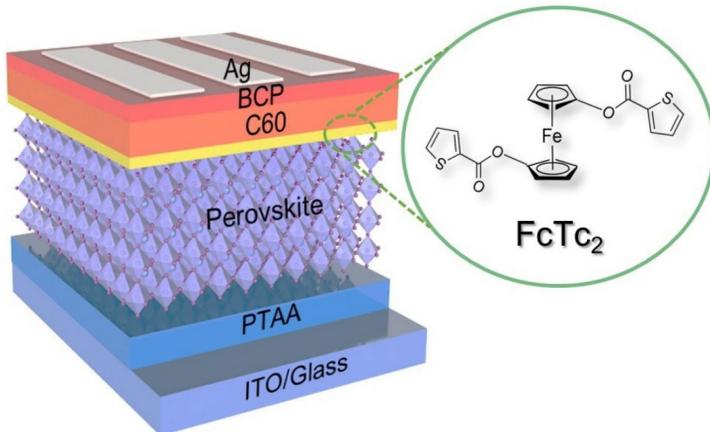
## VIDEO OF THE MONTH



[How do solar panels work?](#)

If you are not familiar with or need a refresher on solar technology, this five-minute TED lesson on the fundamentals of the technique is a great watch: [How do solar panels work?](#) by Richard Komp.

## LINK OF THE MONTH



[The solar cell with the ferrocene layer highlighted](#)

© Imperial College London.

Cheaper solar cells could be on the way thanks to materials created at Imperial College London. Here is an article by Hayley Dunning, April 21, 2022: [Cheaper solar cells could be on the way thanks to materials created at Imperial.](#)

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## UPCOMING RIGAKU WEBINARS

**Live Event: Evaluation of Pharmaceutical Products by Thermal Analysis**

June 16, 2022 1 AM | CST

This webinar will focus on the pharmaceutical applications evaluated by common methods in thermal analysis such as STA, DSC, MTDSC and evolved gas analysis.

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## FEATURED APPLICATION NOTES



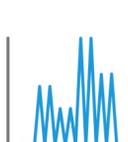
**XRD**

**Crystal orientation evaluation of epitaxial film and ultra-thin buffer layers by in-plane reciprocal space mapping**

*Rigaku Corporation*

ZnO is drawing attention as a new material for transparent conductive films and is expected to be used in flat-panel displays and white LEDs. For the evaluation of the epitaxial-film materials, it is important to understand the relationship of the crystal orientation between the substrate and the film. In-plane reciprocal space mapping reveals the crystal orientation in the sample in-plane direction.

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**WDXRF**

**Pt, Rh and Pd Analysis of Used Automobile Catalyst by WDXRF**

*Rigaku Corporation*

The number of automobiles in developing nations has increased dramatically in recent years, which has caused serious air pollution in those countries. In developed nations, tight control on exhaust emission is already being enforced while emission control standards in developing countries are still lax. In the future, emission control standards must become tighter throughout the world. This application note introduces XRF analysis of Pt, Rh and Pd in used automobile catalyst.

[Read More >](#)



**EDXRF**

**High Calcium Limestone**

*Applied Rigaku Technologies*

Limestone (calcium carbonate) has many uses as the main ingredient in cement and mortar and is used as an aggregate in concrete and asphalt for building roads. Limestone is also used as a soil conditioner and is the raw material for making quick lime (calcium oxide), slaked lime (calcium hydroxide). During mining and processing operations it is important to monitor and control the limestone composition to ensure proper quality and characteristics desired for the various products. Rigaku meets this industry need with a high-performance, low-cost benchtop EDXRF system. Rugged and reliable, the NEX QC+ is an ideal tool for measuring major carbonate and oxide components in limestone, with simple and intuitive software designed for the non-technical, at-line operator and for use in quality control labs. The measurement of CaCO<sub>3</sub>, MgCO<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub> and K<sub>2</sub>O in high calcium limestone is demonstrated using empirical calibration.

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