

Thermo Fisher advances FTIR microscopy with faster, simplified molecular analysis

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New Nicolet RaptIR X FTIR Microscope combines high-definition optical imaging with rapid infrared microspectroscopy, targeting applications across pharmaceuticals, materials science, microplastics, forensics and advanced research



Thermo Fisher Scientific has launched the **Thermo Scientific™ Nicolet™ RaptIR™ X FTIR Microscope**, expanding its infrared microscopy portfolio with a platform designed to make advanced chemical analysis of microscopic samples faster, simpler and more accessible to laboratories.

Combining high-definition optical microscopy with Fourier Transform Infrared Spectroscopy (FTIR) microspectroscopy, the new system enables researchers to locate microscopic features and subsequently determine their molecular composition. The approach is intended to shorten the journey from observing a feature of interest to obtaining actionable chemical information.

The RaptIR X arrives as laboratories across pharmaceuticals, materials science and industrial research increasingly need to characterise smaller and more complex samples while maintaining speed, reproducibility and analytical confidence.

From Microscopic Observation to Molecular Identification

FTIR microscopy brings together spatial imaging and molecular spectroscopy, allowing scientists to investigate not simply what a microscopic feature looks like, but also what it is chemically.

Thermo Fisher has positioned the RaptIR X around this workflow. The microscope can collect **up to 10 spectra per second at 5-micron spatial resolution**, enabling rapid chemical mapping across comparatively large sample areas.

Its imaging capabilities provide **1-micron visible resolution and 5-micron infrared resolution**, helping researchers precisely locate small features before analysing their chemical composition.

The platform is designed for applications ranging from the identification of polymers and microplastics to pharmaceutical formulation analysis, failure investigations and quality assurance. It can also support forensic analysis, art conservation, geological and mineral characterisation and wider materials research.

“The RaptIR X microscope brings the speed, precision and flexibility laboratories need to investigate increasingly complex samples, while making advanced FTIR microscopy easier to use than ever before,” said **Ganesh Prasad, General Manager, Vibrational Spectroscopy Products at Thermo Fisher Scientific**.

“It’s a platform that reflects our commitment to innovation — giving laboratories the confidence to move from a microscopic observation to a molecular answer, quickly and reliably.”

Simplifying Advanced FTIR Workflows

A key focus of the new system is usability. Building on five decades of Nicolet FTIR development, Thermo Fisher has designed the microscope for both experienced spectroscopy professionals and researchers who may be relatively new to FTIR microscopy.

The instrument operates through **Thermo Scientific™ OMNIC™ Paradigm Software**, which provides guided workflows for sample acquisition and analysis. By simplifying steps between measurement and interpretation, the software is intended to reduce the learning curve associated with sophisticated infrared microscopy.

Automation is another important element. Automated detector switching and a fixed detector position reduce the need for manual intervention while helping laboratories maintain consistent measurements across different analytical ranges.

This combination of automation and guided workflows could be particularly relevant for multi-user laboratories where instruments need to serve scientists with varying levels of spectroscopy experience.

Tackling Larger and More Challenging Samples

The RaptIR X also addresses a practical limitation encountered in some microscopy workflows: accommodating unusually large or heavy samples.

Its heavy-duty stage can handle samples **up to 40 mm thick and weighing up to 5 kg**, expanding the types of objects that can be examined without extensive sample preparation or modification.

That capability broadens its potential application in areas such as industrial failure analysis, geological research, advanced materials and investigations involving larger manufactured components.

A Platform Designed to Expand

Rather than operating solely as a fixed-configuration instrument, the RaptIR X has been developed as a modular platform.

It can function as a standalone microscope or integrate with **Nicolet Apex** and **Nicolet iS50 FTIR spectrometers**, allowing laboratories to build on existing spectroscopy infrastructure.

Optional capabilities include micro-ATR, polarised visible and infrared analysis, fluorescence visualisation, near-infrared microscopy, grazing-angle optics and additional detector configurations.

This expandability allows laboratories to tailor the instrument to specific research requirements and add capabilities as analytical needs evolve.

For pharmaceutical researchers, the system can support formulation and material characterisation. Materials scientists can use chemical mapping to investigate polymers, contaminants and microscopic defects, while environmental researchers can apply FTIR microscopy to the increasingly important challenge of identifying and characterising microplastics.

Across these applications, the underlying objective remains the same: connecting microscopic visual information with molecular identification while reducing the complexity and time traditionally associated with advanced spectroscopic analysis.

With the Nicolet RaptIR X, Thermo Fisher Scientific is extending FTIR microscopy beyond instrument performance alone, placing greater emphasis on workflow simplicity, automation and flexibility as laboratories seek faster routes from **sample observation to molecular insight**.