

Microscope Spectrometer



AI Overview

A microscope spectrometer combines the magnification of a microscope with the spectral analysis capabilities of a spectrophotometer, enabling precise measurement of microscopic sample spectra from UV to near-infrared.

Overview A microscope spectrometer, also called a microspectrophotometer, is a hybrid instrument that integrates a microscope with a spectrometer to analyze the spectral properties of very small sample areas, often on the micron or sub-micron scale . It allows researchers to measure absorbance, reflectance, and emission spectra, including fluorescence and photoluminescence, of microscopic samples without extensive preparation .

Working Principle The instrument works by directing light onto a microscopic sample and collecting the transmitted, reflected, or emitted light. The spectrometer component then separates the light into its spectral components using prisms or diffraction gratings, measuring the intensity as a function of wavelength . Specialized algorithms can further analyze the data to determine thin-film thickness or act as a colorimeter for microscopic samples .

Spectral Range Microscope spectrometers typically operate over a wide spectral range, from the deep ultraviolet (UV) to the near-infrared (NIR). This broad range allows the study of materials that absorb or emit light outside the visible spectrum, which is particularly useful for analyzing colorless or transparent substances .

Applications

- Material Science:** Characterizing thin films, coatings, and microstructures.
- Biology:** Measuring molecular spectra of cells, tissues, or microscopic organisms.
- Semiconductor Industry:** Analyzing micro-LEDs, OLEDs, and epitaxial layers using techniques like Raman, photoluminescence, and lifetime spectroscopy .
- Forensics and Art Conservation:** Non-invasive analysis of pigments and dyes.

Advantages

- High spatial resolution:** Can measure areas smaller than a micron.
- Minimal sample preparation:** Works with solid or liquid samples directly.
- Versatility:** Supports multiple spectroscopy techniques on...

Article Content

Microspectroscopy solutions

What is a Microspectrophotometer? A microspectrophotometer measures the spectra of microscopic samples or microscopic areas on samples non-destructively, using different wavelengths of light,

Scientific Cameras, Microscopy Systems,

Andor is a world leader in design and manufacture of high-performance EMCCD, sCMOS and CCD cameras, microscopy systems, spectrographs, and optical

High-Value Life Science and Material Research and

Bruker's differentiated high-value life science research and diagnostics solutions enable scientists to make breakthrough discoveries and develop new

CRAIC Technologies Microspectrophotometer

CRAIC Technologies products include UV and NIR microscopes, UV-visible-NIR microspectrophotometers, instruments to measure thin film thickness and

Electron microscopy

Discover Thermo Fisher Scientific electron microscopy solutions that enable nanoscale imaging for material, life sciences, and semiconductor analysis.

Combining Spectroscopy with Microscopy

Microscopy The main types of microscopy that can be combined with spectroscopy are optical microscopy, electron microscopy and scanning probe

Microspectrophotometer | Spectra of Microscopic Samples

Different types of microspectrophotometers cater to specific needs. Some are designed as add-ons for standard microscopes or probe stations, like the

CRAIC Technologies Microspectrophotometer

508PV Spectrometer For Your Microscope Apollo M Confocal Raman
Microspectrometer UVM-1 UV-Visible-NIR Microscope GeoImage Vitrinite

Optical spectrometer

The spectrometer uses a prism or a grating to spread the light into a spectrum. This allows astronomers to detect many of the chemical elements by their

CRAIC Technologies Microspectrophotometer & Microspectrometer

CRAIC Technologies™ designs, builds and supports microspectrometers that collect spectra and images of microscopic samples from the deep UV to the NIR.

Cobolt Lasers

Cobolt lasers are renowned for their exceptional reliability and long operational lifetimes, making them a trusted choice across demanding scientific and

Mikroskop Spektroskopie A.S. & Co.

A.S. & Co. utilizes standard research microscopes and routine stands and modifies their optical part to extend their spectral range starting from 220 nm to 2200 nm.

Scanning Electron Microscope Spectrometer

Scanning Electron Microscope Spectrometer, Total:9 items. In the international standard classification, Scanning Electron Microscope Spectrometer involves: Analytical chemistry, Protection against crime,

Microspectrophotometer: Working, Components,

A microspectrophotometer is a device that combines a spectrophotometer with a custom-designed microscope. The microscope's

Microspectrophotometer: Working, Components,

The microscope spectrometer offers a notable advantage in its capacity to employ apertures that enable precise control of the analysis area,

FTIR Spectrometers | SHIMADZU

FTIR spectrometers are used to identify organic, polymeric and inorganic materials, though it is used for the latter more infrequently. FTIR spectrometers work by

UV/Vis/NIR Microscopic Spectrophotometer

The MSV-5000 series is a microscopic spectrophotometer system providing transmittance/reflectance measurements of a microscopic sample area with a

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High Resolution Raman Spectrometer with Microscope Integration

Learn how direct integration of high-resolution Raman spectrometers with microscopes delivers sharper spectra, better spatial detail, and faster workflows.

PerkinElmer unveils Spotlight Aurora-I FTIR microscope

PerkinElmer announced the launch of the Spotlight™ Aurora-I FTIR Microscope, expanding the Spotlight™ Aurora family with intelligent adaptive IR

Micro-spectrophotometry

A microspectrophotometer can be configured to measure transmittance, absorbance, reflectance, light polarization, fluorescence (or other types of luminescence such as photoluminescence) of sample

Contact Us

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