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Providing Complete Spectroscopy Solutions

AGILENT HELPS SCIENTISTS AND ENGINEERS ANALYZE QUALITY AND ENSURE SAFETY

Spectroscopy instruments measure the physical and chemical properties of materials. They are used to ensure environmental quality, human health, and the safety of a wide variety of everyday products.

Agilent supports the work of scientists and engineers engaged in environmental analysis, food testing and agriculture, semiconductor analysis, geochemistry, metals and mining, energy and fuel production, materials science, industrial R&D, quality control, clinical and life science studies, pharmaceuticals, forensics, and academic research.

Agilent's instrument portfolio includes both atomic spectroscopy and molecular spectroscopy products. The company's broad product range in both sectors ensures that laboratories are able to choose an instrument that is suited to their particular needs, based on factors such as the number and type of samples it needs to analyze, the detection limit it requires, or the characteristics of the sample being investigated.

Atomic spectroscopy

Atomic spectroscopy is used to determine the elemental composition of a sample by measuring its electromagnetic or mass spectrum. It can be used to test and characterize a variety of organic and inorganic materials, from water to steel, and from plant tissue to high-purity acid.

Agilent offers a variety of atomic spectroscopy systems:

- **AA:** Atomic absorption is a low-cost, easy-to-use method employed in various industries and research applications—from toxicology to electroplating. Agilent's AA instruments are sensitive, rugged, and reliable.
- **MP-AES:** Agilent's unique microwave plasma-atomic emission system runs on air—no expensive or flammable gases required—making it exceptionally cost effective and safe.
- **ICP-OES:** Agilent's inductively coupled plasma-optical emission system provides dual-view measurement (axial for highest sensitivity and radial for maximum robustness) using the same instrument configuration and in a single time-saving measurement. The instrument is ideal for routine food, environmental, and pharmaceutical testing as well as mining and industrial applications.
- **ICP-MS:** Inductively coupled plasma-mass spectrometry is used for high-sensitivity trace element analysis in environmental, clinical, pharmaceutical, and semiconductor labs, as well as in forensics, toxicology, industrial monitoring, and other applications. Agilent's ICP-MS system delivers interference-free analysis over a concentration range covering up to 11 orders of magnitude dynamic range.
- **ICP-QQQ:** Agilent's groundbreaking triple-quadrupole ICP-MS system—the first instrument of its kind—provides unmatched accuracy for difficult elements and problematic matrices. Extending the scope of ICP-MS to low level analysis of non-metals such as S, P and Cl, it also allows controlled reaction chemistry to remove direct overlaps, which cannot be separated by high-resolution ICP-MS. ICP-QQQ

delivers effective and consistent interference removal and unprecedented accuracy in the most challenging applications.

Molecular spectroscopy

Molecular spectroscopy is used to determine the molecular composition of a sample. This is done by directing ultraviolet, visible, or infrared light onto a sample and then measuring the amount and type (i.e. wavelength/frequency) of light absorbed, transmitted, reflected, or emitted. Molecular spectroscopy is used to discover, characterize, and quantify a variety of organic and inorganic materials, whether solid, liquid, or gas. Examples include nucleic acids and proteins, biological tissues, biofuels, fine chemicals, optical filters, composites, and thin film coatings.

Agilent offers a full range of molecular spectroscopy products, including both in-lab and mobile instruments.

- **UV-Vis:** Agilent offers ultraviolet-visible spectroscopy systems that are able to capture the complete UV-Vis spectrum in less than one second. The company's portfolio includes systems ideal for determining the quality of pharmaceuticals, the character of fine chemicals, or the purity of nucleic acids and proteins.
- **UV-Vis-NIR:** Ultraviolet-visible-near infrared systems from Agilent set the standard for photometric noise, range, and linearity. They measure thin film coatings such as those used on glass or solar panels in minutes.
- **FTIR:** Fourier transform infrared systems from Agilent run the gamut from compact bench-top models to handheld analyzers that deliver immediate, on-the-spot results. These systems provide quantitative and qualitative analyses of solids, liquids, and gases.
- **FTIR microscopes and imaging systems:** Agilent's imaging and microscopy instruments provide solutions for analyzing polymer laminates, finding defects in electronic components, and investigating diseases. Providing answers in minutes, these systems deliver resolution comparable to what is seen on a synchrotron.
- **Fluorescence:** Agilent offers the only fluorescence instrument that has room-light immunity and lets customers take full advantage of fibre optics to analyze solid and liquid samples. The company's fluorescence instruments are used to investigate biological pathways, drug-binding kinetics, and the properties of chemical raw materials. They employ a wide range of measurement techniques, including fluorescence polarization, steady-state fluorescence, phosphorescence, or luminescence.

To learn more, visit Agilent's [atomic spectroscopy](#) and [molecular spectroscopy](#) websites.