

Materials for Spectrometers



AI Overview

Spectrometers require materials that are optically transparent, chemically stable, and compatible with the wavelength range of interest, including specialized plastics, epoxies, metals, and certified reference materials.

Optical Components
Plastics and Epoxies: Modern spectrometer designs increasingly use transparent plastics and shape memory epoxies for optical elements. For example, bisphenol A epoxy is highly transparent across the visible to SWIR range and can be stress-engineered to create birefringence for spectral encoding. These materials are lightweight, low-cost, and suitable for compact, mass-producible spectrometers.

Glass and Crystals: Traditional spectrometers often use optical glass, quartz, or other crystalline materials for lenses, prisms, and diffraction gratings due to their high transparency and minimal optical distortion across UV, visible, and IR ranges.

Substrates and Sample Holders
Cuvettes and Thin Films: Spectrometers require substrates that do not interfere with measurements. Quartz or optical-grade plastics are commonly used for cuvettes and thin-film holders, ensuring minimal absorption or scattering in the measurement wavelength range.

Metal Components: Structural and reflective parts of spectrometers may use aluminum, stainless steel, or other alloys for durability and thermal stability. Metal databases can help select alloys with appropriate mechanical and thermal properties for spectrometer construction.

Reference and Calibration Materials
Certified Reference Materials (CRMs): For accurate calibration and instrument tuning, analytical standards and CRMs are essential. These materials are homogenous, have fixed concentrations, and are manufactured under ISO-certified conditions to ensure reproducibility in environmental, food safety, and elemental analysis applications.

Light Sources: The choice of light source also depends on material compatibility. Halogen, deuterium, xenon, or mercury lamps are used depending on the spectral range, and the filament or lamp housing materials must...

Article Content

Time-of-flight Secondary Ion Mass Spectrometer – Precision

Time-of-flight secondary ion mass spectrometer for helium ion microscopes. Enables nanoscale elemental analysis, depth profiling, and high-resolution imaging.

ESI EDX8800M MAX Energy Dispersive X-Ray Fluorescence

The ESI EDX8800M MAX is a high-performance, floor-standing energy dispersive X-ray fluorescence (EDXRF) spectrometer engineered for precise, non-destructive elemental analysis of inorganic solid

Products & Solutions

We are a developer, manufacturer and distributor of high-performance scientific instruments and analytical and diagnostic solutions that enable our customers to explore life and materials at

Spectrometers for Chemical Analysis

A chemical analysis spectrometer is an analytical device that uses light absorption to determine the purity and chemical characteristics of substances. It also

Handheld Mass Spec for Chemical Identification

MX908 is a handheld mass spectrometer used by first responders for rapid trace-level chemical identification of narcotics, hazardous materials, and explosives.

Fangyuan Scientific Instruments FYFS-2002E Fully Automated Low ...

The Fangyuan Scientific Instruments FYFS-2002E is a fully automated, low-background gamma-ray spectrometer engineered specifically for quantitative radionuclide analysis in inorganic non-metallic

Certified Reference Materials (CRMs) for Spectrometer | IFS

Certified reference material Supplier. Reference materials are important for analytical chemistry & clinical analysis for accurate calibration of spectrometers.

Spectrometer

Optical spectrometers (often simply called "spectrometers"), in particular, show the intensity of light as a function of wavelength or of frequency. The different

Spectrometers – Visual Encyclopedia of Chemical

Mass spectrometers are widely used in laboratories for educational purposes and in the field to study the emission of molecules. They are also used to help trace

Material Innovation Keys Scalable Spectrometer Design

The use of large-scale stretched epoxy films as filters significantly enhances the yield of the spectrometer. The team realized miniaturized

ICP-OES Spectrometers

ICP-OES spectrometers measure the concentration of elements from ppb to % using de-excitation of atoms and ions in a plasma. Discover our solutions [here](#).

Near Infrared Spectrometers | Ocean Optics

NIR spectrometers are used for rapid, non-destructive analysis of chemical and physical properties such as moisture content, fat and protein levels, polymer

Checking the quality of materials just got easier with a

SpectroGen, a new AI tool, serves as a virtual spectrometer for assessing a new material's quality, offering a faster and cheaper option for

Certified Reference Materials Manufacturers & Suppliers

Certified Reference Materials (CRMs) are the most reliable way to assess an instrument's performance, both in accuracy and precision. CRMs are particularly essential for all forms of spectrometers, be

Spectrometer Technology and Applications

These spectra can be used to investigate elements, masses, isotopes and chemical structures of the sample materials. Mass spectrometers are

Spectrometer

Spectrometers are used in astronomy to analyze the chemical composition of stars and planets, and spectrometers gather data on the origin of the universe.

Alpha Resources, home to quality spectroscopy supplies

Consumables and Certified Reference Materials for use in analyzers and spectrometers

Elemental Analysis Solutions & Analytical Instruments | SPECTRO

SPECTRO is a global leading supplier of advanced analytical instruments like ICP, Arc Spark OES, and XRF spectrometers for precise elemental analysis of materials.

In-Depth Understanding of Desktop Raman Spectrometers Market

Desktop Raman Spectrometers Market Size and Share Analysis - Growth Trends and Forecasts The Desktop Raman Spectrometers market is poised for significant growth, projected to expand at a

Spectrometers & Spectroscopy Equipment | Edmund

Our selection includes gas cells, reflectance standards, phantom samples, fiber optics, and light sources—along with optical elements such as filters, lenses, and

Mobile Mass Spectrometers Market Size, Share & Growth, 2026-2035

The Mobile Mass Spectrometers Market was valued at USD 3.53 billion in 2025 and is projected to reach USD 12.36 billion by 2035, expanding at a CAGR of 13.38% during the forecast

Essential Laboratory Equipment for Metals, Mining and Metallurgy ...

Essential Laboratory Equipment for Metals, Mining and Metallurgy Quality Control Overview In the metals, mining, and metallurgy sectors, quality control is not just a final checkpoint –

Spectrometers – Real-World Applications – pmac

A spectrometer is an indispensable scientific instrument in chemistry, biology, and materials research. It helps scientists identify sample composition,

Interbattery 2026

What you can expect to see Our systems for EDS, EBSD and Micro-XRF on SEM offer comprehensive compositional and structural analysis of

Mass spectrometry

Mass spectrometry is used in many different fields and is applied to pure samples as well as complex mixtures. In a typical MS procedure, a sample, which may be

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