

Types of Spectrometers



Article Overview

Spectrometers are instruments that measure the interaction of matter with energy, and they come in several types including optical, mass, atomic, and infrared spectrometers, each suited for specific analytical purposes.

Optical Spectrometers

Optical spectrometers, also called spectrophotometers, measure the intensity of light as a function of wavelength. They can operate in the ultraviolet (UV), visible (Vis), or near-infrared (NIR) regions of the electromagnetic spectrum. These instruments are used to analyze absorption, transmittance, or emission of light by a sample, providing information about chemical composition and concentration. Subtypes include UV-Vis spectrophotometers, which detect electronic transitions, and colorimeters, which measure absorbance at specific wavelengths to determine concentrations of colored solutions .

Atomic Spectrometers

Atomic spectrometers analyze individual elements in a sample. They are divided into atomic emission spectrometers (AES), which detect light emitted by excited atoms, and atomic absorption spectrometers (AAS), which measure light absorbed by atoms in a flame or plasma. These instruments are widely used in metal analysis and environmental testing .

Mass Spectrometers



Article Content

Spectrometer

There are two types: photon detectors and thermal detectors. Photon detectors work generally by either causing electrons to be

Optical spectrometer

A spectrometer is used in spectroscopy for producing spectral lines and measuring their wavelengths and intensities. Spectrometers

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Mass spectrometers are widely used in various fields, including biomolecule analysis, forensic science, and environmental

Spectrometer

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

Spectrometer Explained: Diagram, Types & Applications

Learn how a spectrometer works, explore its diagram, different types, and key applications in science, research, medicine, and industry.

Spectrometers

This article explains the fundamental principles and different types, covering spectrometers based on dispersive elements like

Spectrometer Basics

In compact UV to infrared spectrometers, there are two types of detectors differentiated by its material, silicon (Si) for short

How Do Spectrometers Work? Spectrometer vs. Spectrophotometer

Spectrometers can be designed and built using a number of different configurations. An alternative configuration is a standalone

Spectrometers | MEETOPTICS Academy

Types of spectrometer Mini Spectrometer : Mini-spectrometers are scaled-down variants of standard spectrometers, designed to

Flyriver: Types of Spectrometers: A Comprehensive Overview

Spectrometers are indispensable tools in various scientific disciplines, playing a crucial role in analyzing the interaction of

Spectrometer

Types of molecular and atomic transitions differ for each method. Analytical instruments known as spectrometers provide information

Spectrometers – Visual Encyclopedia of Chemical Engineering

Spectrometers use light wavelengths to investigate the chemical composition of a sample. Atomic spectrometers use an analytical

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This type of spectrometry is used to study and identify elements, chemical structures, and masses of sample material. Mass

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.yachtchartercapetown.co.za>

Email: info@yachtchartercapetown.co.za

Phone: +27 21 863 4927

Address: 1st Floor, The Towers, 1 St George's Mall, Cape Town, 8001, South Africa

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