

Structure and Function of a Spectrometer



Overview

(often simply called "spectrometers"), in particular, show the intensity of as a function of wavelength or of frequency. The different wavelengths of light are separated by in a or by by a. is an example. These spectrometers utilize the phenomenon of. The light from a s. An optical spectrometer (spectrophotometer, spectrograph or spectroscope) is an instrument used to measure properties of over a specific portion of the, typically used in to identify materials. The variable measured is most often the of the light but could also, for instance, be the state. The independent variable is usually the of.

Article Overview

A spectrometer consists of a light source, sample holder, monochromator or dispersive element, detector, and readout system, all arranged to separate and measure light across different wavelengths.

Main Components and Their Functions

Light Source: The spectrometer begins with a light source that emits radiation across a broad spectrum, such as ultraviolet (UV), visible, or infrared (IR) light. This provides the energy necessary for analysis and determines the spectral range of the instrument . **Entrance Slit:** Light from the source passes through an entrance slit, which controls the amount of light entering the system. The slit width affects both spectral resolution and intensity, balancing clarity with signal strength . **Collimator:** The collimator converts scattered light into parallel rays, ensuring that the light entering the dispersive element is uniform and well-directed . **Monochromator / Dispersive Element:** A prism or diffraction grating separates the incoming light into...

Article Content

Jun 20, 2026

How Does a Spectrometer Work: Complete Guide

Material Science Spectrometry helps in studying the structural and chemical properties of

Jan 26, 2026

Spectroscopy | Definition, Types, & Facts | Britannica

Spectroscopy, study of the absorption and emission of light and other radiation by matter, as

Feb 04, 2026

Spectrophotometer: Principle, Instrumentation, Applications

The spectrophotometer technique is to measure light intensity as a function of wavelength. It does this by diffracting

Jun 20, 2026

The Structure of a Spectrophotometer

The monochromatic light that leaves the spectrometer is split into two beams before it enters the sample compartment. A

Aug 27, 2025

Spectrometer

Optical spectrometers (often simply called "spectrometers"), in particular, show the intensity of light as a function of wavelength or of frequency. The different wavelengths of light are separated by refraction in a prism or by diffraction by a diffraction grating. Ultraviolet-visible spectroscopy is an example. These spectrometers utilize the phenomenon of optical dispersion. The light from a s

Dec 14, 2025

What Is a Spectrometer in Physics? | Complete Guide

In physics, a spectrometer is a vital instrument used to measure and analyze the properties of light across the

Jul 02, 2026

Spectrophotometer: Principle, Parts, Types, and Uses

The word "spectrophotometer" combines two devices: a spectrometer (which produces light

Dec 01, 2025

Spectroscope | Definition, Diagram & Parts

Learn the spectroscope definition, what spectroscopes do, and how spectroscopes work. Explore spectroscopes parts and functions

Apr 26, 2026

Optical spectrometer

OverviewSpectroscopesSpectrographsSee alsoBibliographyExternal links

An optical spectrometer (spectrophotometer, spectrograph or spectroscope) is an instrument used to measure properties of light over a specific portion of the electromagnetic spectrum, typically used in spectroscopic analysis to identify materials. The variable measured is most often the irradiance of the light but could also, for instance, be the polarization state. The independent variable is usually the wavelength of

Jun 30, 2026

What is a Spectrometer and How Does it Work?

Spectrometers can analyze gases, liquids, and solids, providing crucial information on their

Jul 23, 2026

What is a Spectrometer and How Does it Work?

Mass Spectrometer: Although mass spectrometers do not operate on light, they are often

Mar 27, 2026

Spectrometer

Mass spectrometry is useful to characterize atoms or molecules in a sample, as well as determining chemical and structural

Dec 16, 2025

Spectrometers - Visual Encyclopedia of Chemical Engineering

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

May 03, 2026

What is a Spectrometer? UV, VIS and IR Spectrometer Explained

Spectrometer is an umbrella term which describes an instrument that separates and measures spectral components

Feb 21, 2026

Spectrometer Diagram and Its Components

Explore the components and structure of a spectrometer in this detailed diagram. Understand the parts and their functions for

Oct 08, 2025

What is a Spectrometer?

Raman Spectrometer Raman spectrometers are used to measure the Raman scattering of light from a sample. The

Apr 12, 2026

Spectrometer

A spectrometer measures this change over a range of incident wavelengths (or at a specific wavelength). There are three main

Apr 09, 2026

Module 1: Fundamentals of Spectroscopy

Next, you will use FTIR spectroscopy to look at the structures of limonene and carvone, which differ only in one functional group but

Sep 08, 2025

How Does a Spectrometer Work?

How Does a Spectrometer Work? A spectrometer is a scientific instrument used to analyze the light

May 29, 2026

Optical Spectrometers introduction

Learn everything about optical spectroscopy and how to configure the right settings for optimal use for your

Dec 25, 2025

10: Introduction to Spectroscopy

INTRODUCTION Spectroscopy is the study of the interaction between matter and electromagnetic radiation. The types of

Jun 15, 2026

UV Spectroscopy

UV spectroscopy is a type of absorption spectroscopy in which light of the ultra-violet region (200-400 nm) is absorbed

Jun 09, 2026

The Structure of a Spectrophotometer : Shimadzu (Europe)

The basic measurement principle used by a spectrophotometer is relatively simple and easy to understand. I will explain the principle

Aug 26, 2025

What is a Spectrometer and How Does it Work?

In this article, we will explore what a spectrometer is, how it works, and the different types of

Contact Us

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

Website: <https://iiss.co.za>

Email: sales@iiss.co.za

Phone: +27 63 174 2895

Address: Unit 8, Innovation Park, 15 Rivonia Road, Sandton, Johannesburg, 2196, South Africa

This document is for informational purposes only. Specifications subject to change without notice.

