

Attenuation plate of spectrometer



Article Overview

An attenuation plate in a spectrometer is an optical component used to reduce the intensity of light reaching the detector, preventing saturation and enabling accurate measurements across a wide dynamic range.

Function and Purpose

An attenuation plate, sometimes referred to as a neutral density filter or optical attenuator, is placed in the optical path of a spectrometer to control the intensity of light entering the detector. This is particularly important when analyzing highly absorbing or highly concentrated samples, where the transmitted light could otherwise exceed the detector's linear range, leading to inaccurate readings or detector saturation. By reducing light intensity uniformly across the relevant wavelength range, the attenuation plate ensures that the detector operates within its optimal sensitivity range.

Applications

- **UV-Vis Spectrophotometry:** In UV-Vis spectrometers, attenuation plates allow measurement of samples with very high absorbance without overloading the photodetector. They are often used in combination with the Beer-Lambert law to maintain linearity in absorbance measurements.
- **FTIR Spectroscopy:** While FTIR primarily uses techniques like Attenuated Total Reflectance (ATR) for sample analysis, attenuation plates can be used in the light path to reduce the intensity of the infrared beam, especially when analyzing highly absorbing materials such as carbon black-filled rubbers.
- **Diode-Array and Grating-Based Spectrometers:** In systems where a broad spectrum...

Article Content

FTIR Accessories: Attenuated Total Reflectance (ATR)

ATR method involves pressing the sample against a high-refractive-index prism and measuring the infrared

9.4: Terminations and Attenuators

9.4.1 Terminations Terminations are used to completely absorb a forward-traveling wave and the reflection coefficient

ATTENUATOR SELECTION GUIDE HIGH FREQUENCY

Note: This guide is a product overview, not exact electrical specification. Please refer to product series specification for electrical

Schematic diagram of the experimental setup. A: attenuation piece; V ...

Download scientific diagram | Schematic diagram of the experimental setup. A: attenuation piece; V: Vortex plate; BS: 5:5 beam

Reduction of Polarization Sensitivity of Grating-Based Spectrometer ...

Reduction of Polarization Sensitivity of Grating-Based Spectrometer Using Achromatic Quarter-Wave Plate Significance Statement

Neutral Density Filters – optical attenuators, reflective, ND filter ...

Neutral density filters are optical attenuators with an approximately constant attenuation in a substantial wavelength range.

Waveplate

Waveplates are constructed out of a birefringent material (such as quartz or mica, or even plastic), for which the index of refraction is

Attenuated Total Reflection

Attenuated total reflection Fourier transform infrared spectroscopy (ATR FT-IR) experiments were performed using an FT-IR

Reduction of the polarization sensitivity of grating-based spectrometer ...

When the measured light passes through the achromatic quarter-wave plate twice, its polarization state rotates

Waveplate

Linearly polarized light entering a half-wave plate can be resolved into two waves, parallel and perpendicular to the optic axis of the

Tutorial: Attenuation of X-Rays By Matter

Conclusion The attenuation of X-rays by matter is a specific example of the more general phenomenon of the

Cell Density Measurement by OD600 Method

In this spectrophotometric measurement, the attenuation of the light intensity caused by the cells present in the culture medium is

Attenuation Plate, Neutral density filters factory stock

Borisun provides excellent neutral density filters, with optional absorption/reflection, uniform/step/continuous, uncoated/anti-reflection,

Attenuation

Frequency-dependent attenuation of electromagnetic radiation in standard atmosphere In many cases, attenuation is an exponential

FTIR Spectroscopy: Attenuated Total Reflectance (ATR)

Infrared Beam ATR Crystal Introduction Mid-Infrared (IR) spectroscopy is an extremely reliable and well recognized fingerprinting

8ATT20EN

Noise attenuation is achieved by the specific hole geometry of the attenuator plate, which is the result of intensive computational and

Influence of Plate Material on the Attenuation Effect of Plate ...

To investigate the influence of the plate material on the attenuation effect of plate resonator silencers, parameter studies are

Accessories for Agilent Cary UV-Vis-NIR Spectrophotometers

The UMA is included as part of the Cary 7000 Universal Measurement Spectrophotometer (UMS). For the 4/5/6000i series, the

A Comprehensive Report on Ultrasonic Attenuation of Engineering

In this paper, ultrasonic attenuation of engineering materials is evaluated comprehensively, covering metals,

Attenuators

Fixed attenuators There are many commercially available fixed attenuators, including chip, coaxial, and waveguide implementations.

Thorlabs · Laser Beam Attenuators

Thorlabs' Beam Attenuators use a twofold reflection on two stacked prisms for attenuation of high-power

Neutral Density Attenuators/Filters

The attenuators described before can provide a high degree of attenuation however, these neutral density attenuators cannot

Reduction of the polarization sensitivity of grating-based spectrometer ...

In this work, we developed a method to reduce the polarization sensitivity of grating-based spectrometer by using an

Attenuated Total Reflectance (ATR)

Attenuated Total Reflection (ATR) is a measurement technique used in IR spectroscopy, the most common

Imaging plate scanners calibration and the attenuation behavior of ...

The Global Spectrometer for Positron and Electron Characterization (GSPEC) is capable of detecting electrons and

Fluorescence plate reader, absorbance-, Luminescence plate reader

The NanoQuant Plate allows analysis and quantification of as little as 2 µl of up to 16 nucleic acid and protein samples in parallel.

Laser Power Attenuators

Compact Variable Attenuators designed to continuously attenuate linearly polarized laser beams. Clear aperture ø17 mm or ø22 mm.

10.2: Spectroscopy Based on Absorption

10.2.1 Absorbance Spectra There are two general requirements for an analyte's absorption of electromagnetic radiation. First, there

Schematic diagram of the experimental setup. A: attenuation piece; V ...

In order to study the signal stability of reheated double pulse laser-induced breakdown spectroscopy (LIBS). Utilizing single Gaussian

Experimental and numerical investigation on vibration attenuation ...

To meet the low-frequency broadband vibration attenuation requirements, a series of SSRM plates is designed. Based on output

Contact Us

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

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

Email: sales@watermanfinance.co.za

Phone: +49-176-8294713

Address: Neue Mainzer Str. 66-68, 60311 Frankfurt am Main, Germany

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