

Article Overview

The Huijue 750b Spectrometer operates on the principle of spectrophotometry, measuring light absorption by a sample to determine its concentration using the Beer-Lambert law.

Core Principle

The Huijue 750b Spectrometer functions by analyzing how a sample absorbs or transmits light at specific wavelengths. When light passes through a solution, molecules in the sample absorb certain wavelengths while allowing others to pass through. The spectrometer measures the intensity of light before and after it passes through the sample, enabling the calculation of absorbance, which is directly related to the concentration of the substance in the solution according to the Beer-Lambert law (absorbance is proportional to concentration and path length) .

Key Components and Their Roles

- o Light Source: Provides a broad spectrum of light, which may include ultraviolet (UV), visible, or near-infrared (NIR) regions. Common sources include tungsten lamps for visible light and deuterium or hydrogen lamps for UV light .
- o Monochromator or Spectrometer: Disperses the light into individual wavelengths and selects the desired wavelength for analysis. This can be achieved using prisms or diffraction gratings .
- o Sample Holder (Cuvette): Holds the sample in a transparent container of uniform thickness, ensuring a consistent optical path length for accurate measurements .
- o Detector: Measures the intensity of transmitted light and converts it into an electrical signal, which is then processed to display absorbance or transmittance values .

Operational Principle

- o The light source emits a beam that passes through the monochromator to isolate a specific wavelength.
- o The selected wavelength passes through the sample in the cuvette.
- o The detector measures the transmitted light, and the spectrometer calculates the absorbance.
- o Using the Beer-Lambert law, the instrument determines the concentration of the analyte in the sample .

Applications

The Huijue 750b Spectrometer can be used for quantitative analysis in chemistry, biology, and clinical laboratories, including measuring enzyme activity, protein concentration, and nucleic acid quantification, as well as monitoring chemical reactions . In summary, the Huijue 750b Spectrometer relies on light absorption measurement, precise wavelength selection, and the Beer-Lambert law to provide accurate quantitative analysis of samples.

Spectrophotometer is an analytical instrument which is used to measure the light absorbed, transmitted or reflected by

Explore atomic absorption spectrophotometry (AAS) principles, instrumentation and applications, with comparisons to

Atomic absorption spectroscopy is an analytical technique used for trace metals analysis. What is atomic absorption spectroscopy

Mass spectrometry, analytic technique by which chemical substances are identified by the sorting of gaseous ions in

Raman spectroscopy is commonly used in chemistry to provide a structural fingerprint by which molecules

UV-Vis Spectroscopy or Ultraviolet-visible spectroscopy or Ultraviolet-visible spectrophotometer (UV-Vis) is also

This review article focuses on the principles and applications of miniaturized near-infrared (NIR) spectrometers. This

PubMed® comprises more than 40 million citations for biomedical literature from MEDLINE, life science journals, and online books.

The use of wavenumber for infrared spectroscopy also allows for easier visualization of spectral differences as the wavelength gets

OE750 from Hitachi High-Tech. This brand-new spark spectrometer allows you to analyse all main alloying

Unpack the science of NMR spectroscopy: from fundamental physics and hardware components to the precise methods of molecular

Spectrometer An XPS spectrometer A spectrometer (/ spek'tr?mIt?r /) is a scientific instrument used to separate and measure

The principle of measurement for UV-Visible Spectroscopy or UV-Visible spectrophotometer is relatively straightforward and consists

Electron paramagnetic resonance (EPR) spectroscopy detects unpaired electrons and provides detailed

information on

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

Spectroscopy deals with the production, measurement, and interpretation of spectra arising from the interaction of

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