What is the function of a spectrophotometer

Overview

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

Key Takeaways

A spectrophotometer measures the amount of light absorbed or transmitted by a substance at specific wavelengths, allowing determination of concentration, purity, and chemical identity.Core Function

A spectrophotometer works by shining a controlled beam of light through a sample and measuring how much light passes through or is absorbed. The difference between the incident light and transmitted light reveals the sample's absorbance, which is directly related to its concentration according to the Beer-Lambert Law. This principle allows scientists to quantify the amount of a substance in a solution accurately .

Key Components
• Light Source: Produces a broad spectrum of light, such as visible or ultraviolet light .

• Monochromator: Filters the light to a specific wavelength using a prism or diffraction grating .

• Sample Holder (Cuvette): Contains the solution being analyzed .

© 2026 ALFA PRO COMMUNICATION SYSTEMS (Pty) Ltd - All rights reserved

• Photodetector: Measures the intensity of light that passes through the sample .
Applications
• Quantitative Analysis: Determining concentrations of solutes in solutions, such as glucose, urea, or calcium in clinical labs .

• Qualitative Analysis: Identifying substances based on their unique absorption spectra, including organic compounds and gases .

• Industrial and Production Use: Ensuring color consistency in products, monitoring LED light emission, and evaluating pigments or inks .

• Research and Environmental Testing: Measuring enzyme activity, toxicology screening, and analyzing chemical reactions .
Types
• UV-Visible Spectrophotometers: Measure light in the ultraviolet (185–400 nm) and visible (400–700 nm) ranges .

• Infrared (IR) Spectrophotometers: Detect vibrations of chemical bonds in molecules, useful for identifying functional groups . In summary, a spectrophotometer is a versatile analytical tool that provides critical information about a substance's concentration, purity, and identity by measuring how it interacts with light at specific wavelengths .

Article Content

BYJU''S Online learning Programs For K3, K10, K12, NEET, JEE,

A spectrophotometer is an analytical instrument used for the objective calculation of visible light, UV light, or infrared light emission or

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

© 2026 ALFA PRO COMMUNICATION SYSTEMS (Pty) Ltd - All rights reserved

Contact Us

Continue your research online:

Website: https://alfa-pro.co.za
Technical inquiry: https://alfa-pro.co.za/contact.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 ALFA PRO COMMUNICATION SYSTEMS (Pty) Ltd - All rights reserved