

Spherical Spectrometer



AI Overview

A spherical spectrometer is a type of spectrophotometer that uses a spherical geometry to measure the color or spectral properties of a sample by capturing light reflected diffusely from all directions. Definition and Principle A spherical spectrometer, also known as an integrating sphere spectrophotometer, is designed with a spherical interior coated with a highly reflective matte white surface. Light from a source enters the sphere and is scattered uniformly in all directions, effectively making the interior act as a diffuse light source. The detector then measures the light reflected from the sample at an 8-degree angle, allowing accurate capture of the sample's color or spectral characteristics regardless of surface gloss or texture. Measurement Modes Spherical spectrometers can operate in two main modes: Specular Included (SCI): Measures only the color of the sample, excluding the effect of surface gloss or reflection. This ensures that glossy and matte samples of the same color yield similar readings. Specular Excluded (SCE): Includes the effect of surface appearance, capturing both color and gloss, which can differentiate between matte and shiny surfaces. Applications Spherical spectrometers are widely used in industries where accurate color measurement is critical, such as: Automotive coatings, including metallic and pearlescent finishes Cosmetics and personal care products Quality control in manufacturing and shipping Laboratory research for color consistency and spectral analysis Advantages Uniform light distribution ensures consistent measurements across different surface types. Ability to separate color from surface effects allows precise color matching. Versatility for both laboratory and production line applications, including small or irregularly shaped samples. In summary, a spherical spectrometer provides a reliable method for measuring the true color of a sample by using a spherical, diffuse light environment, making it superior for applications where surface gloss or texture could otherwise distort color.

Article Content

Spherical grating spectrometers, Proceedings of SPIE | DeepDyve

Read "Spherical grating spectrometers, Proceedings of SPIE" on DeepDyve, the largest online rental service for scholarly research with thousands of academic publications available at your

Photoneutron spectrometry by novel multi-directional

In this context, a passive multi-directional multi-detector neutron spherical spectrometry system was hypothesized, designed, and developed in

Spectrophotometry

Spectrophotometry is a branch of electromagnetic spectroscopy concerned with the quantitative measurement of the reflection or transmission properties of a

Infrared Spectroscopy of Symmetric and Spherical Top Molecules for ...

This book, Volume 4 in the series, is dedicated to the relationship between laboratory spectroscopy, recording ever-more-complex spectra using increasingly powerful instruments

Spectrophotometry

Spectrophotometry is a tool that hinges on the quantitative analysis of molecules depending on how much light is absorbed by colored compounds.

Integrating Spheres

Thorlabs offers Ø100 mm modular spheres with user-configurable ports, Ø2" spheres with three or four ports, and calibrated spheres of various sizes with a

Spectrometers, monochrometers and spectrographs

Spectrometers, Monochromators and Spectrographs What is a spectrometer? A spectrometer separates an incoming light source into its spectral components,

Sphere Spectrophotometers and Specular Component | proof

To measure the true colour of an object without the influence of surface texture, the Specular Component Included (SCI)

Ci6x Series Sphere Handheld Spectrophotometers

A Color Management Advantage That Fits in The Palm of Your Hand
A Versatile Device For A Range of Color Applications
Available in A Variety of Configurations and Price Points
Learn More About X-Rite's Handheld Sphere Spectrophotometers
From painted surfaces to molded plastic parts, packaging, and apparel textiles, the Ci60 series portable sphere spectrophotometer offers superior measurement performance to ensure color quality in receiving, field operation, and around the manufacturing plant. It is the ultimate solution to measure gloss, opacity, and color strength and compare color. See more on xrite Wikipedia

Integrating sphere - Wikipedia

Integrating spheres are used for a variety of optical, photometric or radiometric measurements. They are used to measure the total light radiated in all directions

Choosing the right measurement geometry

Before you buy a spectrophotometer, the correct measurement geometry must be selected. Please free to contact the ColorLite-Team to get more information.

Color Measurement Instrument Geometries

Konica Minolta Sensing discusses color measurement geometries 45/0, 0/45, and d/8 and how to decide which type best fits your application needs.

Portable Spectrophotometer CM-23d with sphere geometry

Portable sphere type spectrophotometers with horizontal alignment, which is most convenient to measure the colour of flat or large samples.

Standard-Vorlage

Abstract Operation of an X-ray spectrometer based on a spherical variable-line-spacing grating is analyzed using dedicated ray-tracing software allowing fast optimization of the grating parameters

A broadband spherical prism imaging spectrometer based on a single ...

This paper introduces a spherical prism imaging spectrometer of broadband integration in the VNIR-SWIR region and the prototype is fabricated and assembled out on the basis of the system

Tetra-Ball: design of a new type of extended energy range ...

Tetra-Ball (T-Ball) is a new type of extended energy range single-sphere neutron spectrometer. Compared to its predecessor, the SP2, it reduces the number of sensors from 31 to

Imaging x-ray crystal spectrometers for the National Spherical Torus ...

A new type of high-resolution x-ray imaging crystal spectrometers is described for implementation on the National Spherical Torus Experiment (NSTX) to provide spatially and

Integrating Spheres

When combined with a photodetector or spectrometer, an integrating sphere acts as a wide-angle, directionally-insensitive collector of light and is ideal for measuring large, divergent, high power or

Ray-tracing simulations of spherical Johann diffraction spectrometer ...

For these reasons the ray-tracing simulations of the properties of the spherical Johann type X-ray spectrometer are discussed in the present paper in detail. In order to perform the ray

Spectrometer Configurations: Littrow, Czerny-Turner and More

Although it is not commonly found in spectrometers today, it is still used to characterize diffraction gratings. This configuration consists simply of a spherical mirror and a plane grating. The light enters

Spherical spectrophotometer NS810

NS810 spectrophotometer is designed to control the color tone and color difference between the model and the test sample. Suitable for use in the apparel industry, plastics industry, printing industry, in the

Optical system design of aberration-corrected Czerny–Turner imaging ...

Czerny–Turner spectrometers have large and difficult to correct aberrations resulted from off-axis spherical mirrors, which affects the quality of spectrometer imaging and limits its further

High-sensitivity, portable, tunable imaging X-ray spectrometer based

The FSSR-1, 2D spectrometers, based on spherically bent crystals, utilize both the focusing aspects of the spherical mirror configuration as well as the Bragg crystal X-ray diffraction.

Understanding Optical Geometries and Choosing the

Diffuse/8° spectrophotometers, also known as spherical instruments, illuminate the sample equally from all angles while the reflected light is measured

Contact Us

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

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

Email: info@araziyahsafety.co.za

Phone: +27 72 418 3692

Address: 123 Rivonia Road, Sandton, Johannesburg, 2196, South Africa

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

