

Mirror-type Spectrometer



Overview

Such concave mirrors—precisely formed glass surfaces coated with a reflective film of metal—are used in spectroscopic instruments to gather light from a sample onto a diffraction grating that then splits the light into its spectral components for analysis. The new scanning mirror micro spectrometer (SMMS) platform developed at Fraunhofer IPMS is based on a single-axis MEMS (micro electro-mechanical system) scanning mirror. It aims for applications in the near infrared (NIR) spectral range up to a wavelength of 1900 nm, 2200 nm or 2500 nm. A spectrometer can be designed and built with a variety of optical configurations. These include the Littrow configuration, the Ebert-Fastie configuration, the Czerny-Turner configuration, and the concave aberration-corrected holographic grating configuration. Many of these configurations are also. Compact and ultra-compact systems for nearinfrared (NIR) spectral analysis enabling the integration into portable devices or even mobile phones may contribute significantly to the development of future systems for sensing and testing applications. The angle of this mirror can be adjusted. This guide provides some simple and easy to use design guidelines and formulas for designing, evaluating and comparing various diode array, diffraction grating based spectrometers designs The input to the design process is the wavelength range you want to cover and the optical resolution by which. Why is a mirror used instead of a lens?

In instruments that use light, like an FTIR, it is necessary to process light in various ways, such as focusing it or forcing its rays to travel in parallel. You may think of lenses as objects used for these purposes.

Article Content

Spectrometer Design Guide

Basically, a spectrometer is an optical system consisting of two lenses/mirrors that produces an image of the input slit on the detector. In between the lenses/mirrors is placed a diffraction grating which

Scanning Mirror Micro Spectrometer

The incident radiation from the entrance slit passes the collimation mirror on the scanner mirror before it is diffracted by the fixed grating in the optical path.

Theoretical analysis and simulation of FTIR spectrometer based on ...

In this study, we propose a rotating spectrometer design based on a double-sided mirror. The moving part of the spectrometer is driven by a rotating motor to ensure stable rotational speed

Spectrometers Monochromators and Spectrographs

We make instruments from short focal length, high-throughput spectrographs to long focal length, high-resolution monochromators, with a variety of choices for many different applications.

Concave Spectrometer Mirror – University of Toronto Scientific ...

Such concave mirrors—precisely formed glass surfaces coated with a reflective film of metal—are used in spectroscopic instruments to gather light from a sample onto a diffraction grating that then splits

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

Advanced Spectrometer Optics and Design

The Czerny-Turner design, featuring toroidal mirrors and diffraction gratings, enables asymmetrical optimization for reduced aberrations. Performance specs

TITLE OF ABSTRACT A

The resulting astigmatism can be countered for a single wavelength by making the grating surface a toroid, by changing the mirror distance, or by splitting the large mirror. However, in a conventional

Mirrors Used with FTIR : Shimadzu Scientific Instruments

2. Types of Mirrors The following types of mirrors are used to fulfill the roles of lenses and prisms in the FTIR.

Instrumentation of a UV-Visible Spectrophotometer

Instrumentation of a UV-Visible Spectrophotometer The principle of measurement for UV-Visible Spectroscopy or UV-Visible spectrophotometer is relatively

Dual-Interference Channels Static Fourier Transform

The use of a dual-interference channels static Fourier transform imaging spectrometer based on stepped micro-mirror (D-SIFTS) for

4.3: Instrumentation

There are two types of instruments used to measure IR absorption: Fourier transform (FT) spectrometers and dispersive spectrometers. FTIR spectrometers

The Offner imaging spectrometer in quadrature

This spectrometer is based on the Offner imaging system comprising a concave primary and tertiary mirror and a convex secondary mirror. In the spectrometer design, the secondary mirror is replaced

DIY Scanning Spectrometer Is A Bright Idea

Specifically, has implemented a Czerny-Turner type spectrometer, which is a two-mirror design.

Scanning Mirror Micro Spectrometer

SCANNING MIRROR MICRO SPECTROMETER (SMMS) Motivation Compact and ultra-compact systems for nearinfrared (NIR) spectral analysis enabling the integration into portable devices or

Miniaturized spectrometer containing a simple planar grating and a ...

In this paper, we propose a novel double-pass spectrometer model, which consists of a single planar grating and a single freeform mirror. The freeform mirror performs both collimation and

Mirrors Used with FTIR : Shimadzu Scientific Instruments

Here we introduced and discussed the use of the mirror in FTIR. In the Shimadzu FTIR, the infrared light can be taken out as parallel light from the side of the instrument.

Bruker ALPHA II Fourier Transform Infrared (FTIR) Spectrometer

The Bruker ALPHA II Fourier Transform Infrared (FTIR) Spectrometer is a compact, high-performance benchtop instrument engineered for precision molecular identification and quantitative analysis

Spectrometer

This type of filter is not common in modern spectrometers now that there are more precise elements available for narrowing the radiation. There are also

Technical note / FTIR engine

The two light beams are reflected by the fixed mirror and movable mirror and return to the beam splitter, where they are recombined, causing optical interference. The photodetector acquires light intensity

Different types of IR spectrometers. (A) Basic concept of

Different types of IR spectrometers. (A) Basic concept of a typical Fourier-transform infrared spectrometer showing light source (Globar), beam splitter, fixed and

Optical Spectrometers introduction

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

A High-Resolution MIR Echelle Grating Spectrometer

Such spectrometers cannot meet high-resolution spectroscopy requirements. To address this problem, this paper proposes an immersion

Spectrometer Optics and Spectrometer Design

This spectrometer design is not symmetric, and the two mirrors do not have to be the same size, have the same radii of curvature or be located at the same

Design of optical system of crossed astigmatism Czerny-Turner spectrometer

The principles and correction methods of various aberrations of the cross-type spectrometer are analyzed, the cylindrical mirror is used to correct the astigmatism of the system,

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