

ATR Spectrometer



Article Overview

An ATR spectrometer is an infrared spectrometer that uses attenuated total reflectance (ATR) to analyze solid, liquid, or paste samples directly with minimal preparation.

How ATR Works

ATR is a sampling technique used with infrared (IR) spectroscopy, most commonly FTIR, that allows direct examination of samples without extensive preparation. In ATR, infrared light passes through a crystal with a high refractive index and reflects internally at the crystal-sample interface. Each reflection generates an evanescent wave that penetrates a few micrometers into the sample, allowing the IR light to interact with the material and produce a spectrum representing its molecular composition. The penetration depth depends on the wavelength of light, the angle of incidence, and the refractive indices of both the crystal and the sample. This makes ATR particularly useful for highly absorbing or optically dense samples, where traditional transmission IR spectroscopy would be challenging.

ATR Crystal Materials

Common ATR crystals include diamond, germanium, and zinc selenide (ZnSe). Diamond is highly durable, chemically inert, and suitable for high-pressure applications, making it ideal for most sample types. Germanium and ZnSe are used for samples with higher refractive indices or specific spectral requirements. The choice of crystal affects sensitivity, spectral range, and compatibility with different sample types....

Article Content

Jan 25, 2026

Attenuated total reflectance (ATR)

Attenuated total reflectance or ATR is, along with transmission, one of the most common sampling techniques in Fourier transform

Mar 01, 2026

Principles of ATR

Principles of ATR An attenuated total reflection accessory operates by measuring the changes that occur in a totally internally

Aug 23, 2025

FTIR Spectroscopy: Attenuated Total Reflectance (ATR)

The technique of Attenuated Total Reflectance (ATR) has in recent years revolutionized solid and liquid sample analyses because it

Dec 13, 2025

Atr-Ftir Spectroscopy

ATR-FTIR spectroscopy is defined as a technique that utilizes attenuated total reflectance geometry to measure infrared absorption

Jan 17, 2026

ATR spectroscopy

ATR spectroscopy (attenuated total reflection) ATR measurement technology for the analysis of process liquids - suitable for

Sep 15, 2025

ATR-Spektroskopie

ATR-Spektroskopie (von engl. attenuated total reflection, dt. abgeschwächte oder auch verhinderte Totalreflexion) ist eine infrarot

Sep 06, 2025

Everything You Need to Know About ATR-FTIR Spectroscopy

Everything you need to know about ATR-FTIR spectroscopy: its applications, penetration depth, choose the right crystal for optimal

May 16, 2026

Flexible Benchtop FTIR Spectrometer, Cary 630 FTIR

The Agilent Cary 630 FTIR spectrometer is an ultra-compact, flexible benchtop FTIR spectrometer with

Aug 05, 2025

Flexible Benchtop FTIR Spectrometer, Cary 630 FTIR

Attenuated total reflectance (ATR) is the most widely used sampling methodology for Fourier transform

Jul 21, 2026

Attenuated total reflectance

Attenuated total reflection (ATR) is a sampling technique used in conjunction with infrared spectroscopy which enables samples to be

Jul 25, 2025

ATR-Infrarotspektroskopie – Wikipedia

Für die Aufnahme von IR-Spektren von Werkstücken und Materialproben gehört ATR heute zu den am

May 30, 2026

Attenuated Total Reflectance-Infrared Spectroscopy

ATR-FTIR is defined as a spectroscopy technique that utilizes attenuated total reflectance to detect the absorption of infrared light by

Dec 05, 2025

The differences between FTIR, IR, and ATR-FTIR

What's the difference between ATR and FTIR? Or between IR and FTIR? ATR is a way to record FTIR

Nov 23, 2025

Abgeschwächte Totalreflexion (ATR) | Jetzt informieren

Die abgeschwächte Totalreflexion (ATR) ist eine Probennahmemethode, bei der Licht auf eine Probe geworfen wird, um

Oct 29, 2025

FTIR Accessories: Attenuated Total Reflectance (ATR)

Attenuated total reflection (ATR) is a method that allows the direct measurement of samples for FTIR. ATR

May 04, 2026

ATR-FT-IR-Spektrometer : Fachbereich Chemie : Universität Hamburg

Das in abgeschwächter Totalreflexion (ATR, attenuated total reflection) messende FT-IR-Spektrometer, erlaubt mittels eines flexiblen

Jul 27, 2025

ATR-FTIR

Vibrational Spectroscopy at the Solid/Liquid Interface This module will go over attenuated total reflectance Fourier transform infrared

Feb 04, 2026

ATR spectroscopy

For more than 20 years, Fraunhofer IPM has been developing sensors and measuring systems for process

Jun 28, 2026

Attenuated Total Reflection

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

Sep 23, 2025

The Attenuated Total Reflection (ATR) Technique for Analyzing Plastics

Attenuated Total Reflectance (ATR) is a powerful sampling technique that virtually eliminates sample preparation.

Oct 19, 2025

Fourier Transform Infrared Spectroscopy (FT-IR) Diamond Attenuated ...

Fourier transform infrared spectroscopy (FT-IR) measurements using a diamond attenuated total reflection (ATR)

Apr 27, 2026

Attenuated Total Reflectance (ATR)

ATR is an extremely versatile measurement technique for FT-IR spectroscopy. It's easy to use, easy to maintain, and has plenty of

Aug 21, 2025

ATR-FTIR Spectroscopy, FTIR Sampling Techniques | Agilent

Attenuated total reflectance (ATR) is the most widely used sampling methodology for Fourier transform infrared (FTIR) spectroscopy.

Dec 13, 2025

ATR-FTIR Spectroscopy Basics

Attenuated total reflectance (ATR) is a sampling methodology that enables the direct examination of solid

May 18, 2026

Neues zur Attenuated Total Reflection (ATR)-Spektroskopie

Die Abgeschwächte Totalreflexionsspektroskopie (Attenuated Total Reflection, ATR) ist eine bedeutende Technik in

Jan 06, 2026

ATR-FTIR spectroscopy and spectroscopic imaging for the analysis of ...

For example in-line ATR-FTIR and NIR spectroscopy can be incorporated into a feedback loop to reduce the presence

Oct 04, 2025

Attenuated Total Reflectance-Fourier Transform Infrared Spectroscopy

ATR-FTIR (attenuated total reflectance – Fourier transform infrared spectroscopy) is a technique used to analyze the surface

Contact Us

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