

High-Resolution Portable Raman Spectrometer

ATR2100

Features

- Low-stray light optical path design for improved signal-to-noise ratio
- Optional excitation wavelengths (638 nm, 785 nm, etc.)
- Detachable fiber optic probe for ease of use
- Powerful PC-based spectral analysis software
- Lightweight design, weight ≤ 2 kg
- Compact dimensions, $21 \times 21 \times 10$ cm³
- USB 2.0 interface, 5V DC power supply

Application

- Materials science research
- Pharmaceutical and drug quality control
- Geology and mineral exploration
- Security inspection and public safety
- Environmental pollutant monitoring
- Cultural relic and artwork identification
- Biomedical research
- Jewelry and precious metal identification
- Teaching and scientific research experiments

Description

The ATR2100 portable Raman spectrometer is a new generation of high-performance detection equipment developed by Optosky, integrating ultra-high resolution and portability. This instrument adopts a cooled high-sensitivity CCD detector and a low-stray light optical path design, achieving a spectral resolution better than 6 cm^{-1} and significantly improving the signal-to-noise ratio. It supports optional excitation wavelengths such as 638 nm and 785 nm, and is equipped with an easily detachable fiber optic probe. With its lightweight body (≤ 2 kg, $21 \times 21 \times 10$ cm³), USB 2.0 data interface, and 5V DC power supply design, it perfectly meets the needs of both laboratory and field testing.

The ATR2100 comes with professional PC-based intelligent analysis software, integrating data acquisition, processing, and analysis. It offers multiple measurement modes, including single acquisition and continuous acquisition, to meet the requirements of various application scenarios. The software features advanced functions such as automatic peak finding and baseline correction, and includes a rich built-in material database for rapid sample composition analysis. It supports exporting data in universal formats such as TXT and CSV and directly generates PDF reports.

With its innovative optical design and intelligent operation experience, the ATR2100 redefines the performance standards of portable Raman spectrometers. It delivers stable and reliable test results for both precise laboratory analysis and field testing, making it an ideal choice for researchers and industrial inspection personnel.

Model	Wavelength Range (cm ⁻¹)	Resolution (cm ⁻¹) *
ATR2100	200~2600	≤ 5
ATR2100H	200~2600	≤ 3



Product data information is current as of publication data. Products conform to specifications per the terms of Optosky Standard warranty.

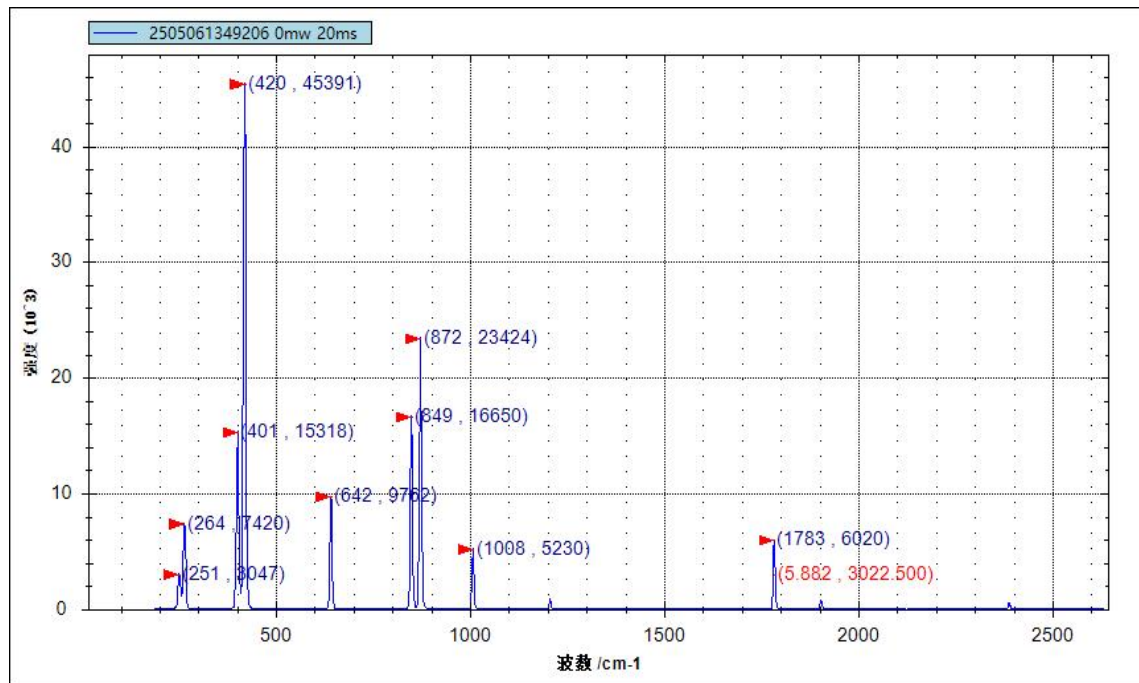
1. Parameter

Detector		
Model	ATR2100	ATR2100H
Type	UV-Enhanced Linear CMOS	
Dynamic Range	3000:1	
Sensitivity	1300V/(lx·s)	
Optical Parameters		
Spectral Resolution	5~17cm-1	3~14cm-1
SNR	>1000:1（918 cm-1 of Acetonitrile, 8s accumulation, 200mW）	
Entrance Slit	50 μm	
Optical System	M-Type Symmetrical C-T Optical Path	
Integration Time	1ms~65s	
Focal Length	98 mm for incidence and output	
Laser Linewidth	0.08 nm	
Raman Probe		
Working Distance	6 mm	
Cut-Off Rate	OD>8	
Numerical Aperture	0.3	
Aperture	7mm	
Reliability		
Laser Power Stability	σ/μ <±0.2%	
Spectral Stability	σ/μ < 0.5% （COT 8 hours）	
Temperature Stability	Spectral Shift ≤ 1 cm ⁻¹ （10~40℃）	
Spectral Intensity Variation（in 5 ~ 40 ℃）	<±5%	
Electrical Parameters		
Data Interface	USB 2.0	
Power Supply Voltage	DC 5V±5%	
Operating Current	70 mA@Typ.	
ADC Bit Depth	16bit	
Physical Parameters		
Operating Temperature	-10~45 ℃	
Operating Humidity	< 95%	
Dimensions (L×W×H)	21×21×10 cm3	
Weight	2 Kg	

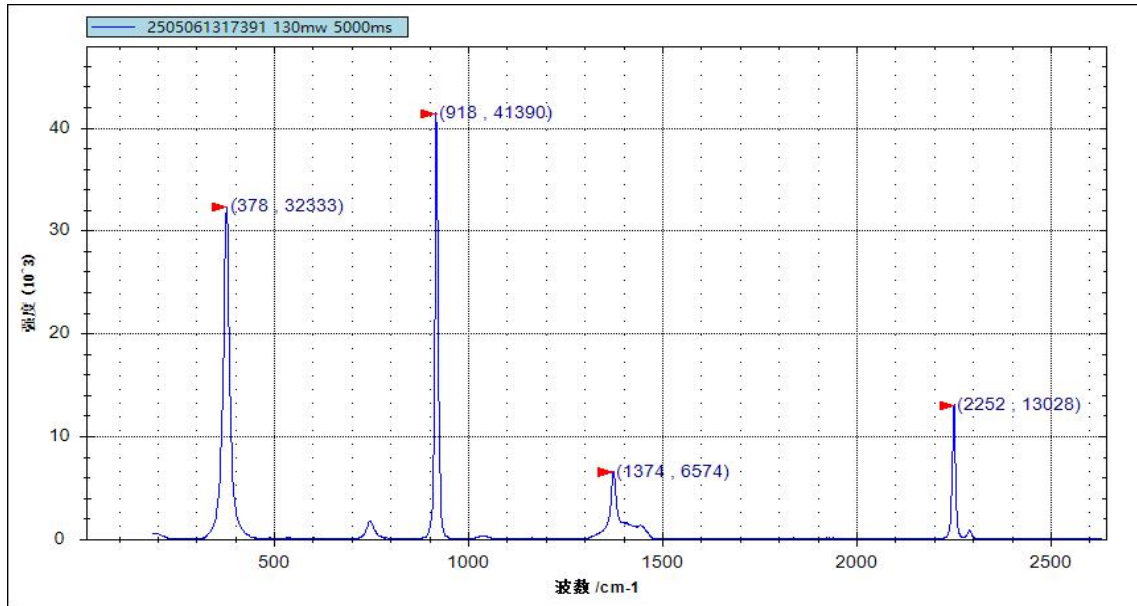
2. Slection Guide

Model	Excitation Wavelength (nm)	Maximum Laser Power (mW)	Wavelength Range (cm-1)	Resolution (cm-1) *
ATR2100-638-35	638±1	100	200~3500	10~13
ATR2100-638-43			200~4300	14~17
ATR2100-785-26	785±1	500	200~2600	3~5
ATR2100-785-35			200~3500	6~8
ATR2100-785-43			200~4300	9~12

3. Key Performance Reports

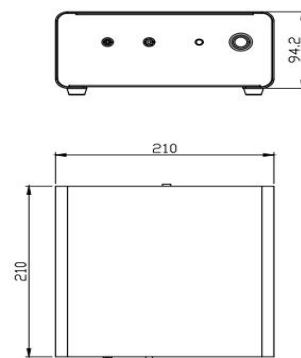


ATR2100 Spectral Resolution (Mercury Lamp 5.882 nm @912.297 nm)



ATR2100 Acetonitrile Spectrum Test (Integration Time: 5 s / Laser Power: 130 mW)

4. Physical Images



ATR2100 Physical Image and Structural Dimensions Diagram

5. Measurement Accessories



Liquid Sample Measurement Cell (Thermo Vial)



Liquid Sample Measurement Cell (HPLC Vial, Micro) (Optional)



ATR20107 Gun-Type Raman Probe (Optional)



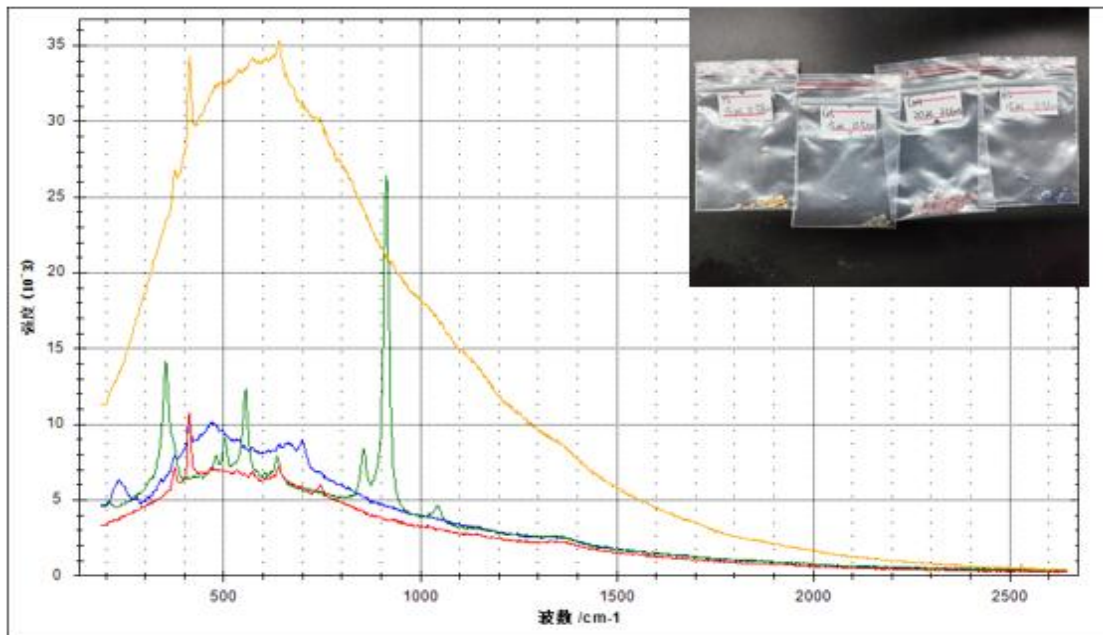
Precision Adjustment Stand (for Solid and Powder Measurements)



NMR Tube Sample Measurement Cell (for Liquid and Powder Measurements)

6. Application Cases

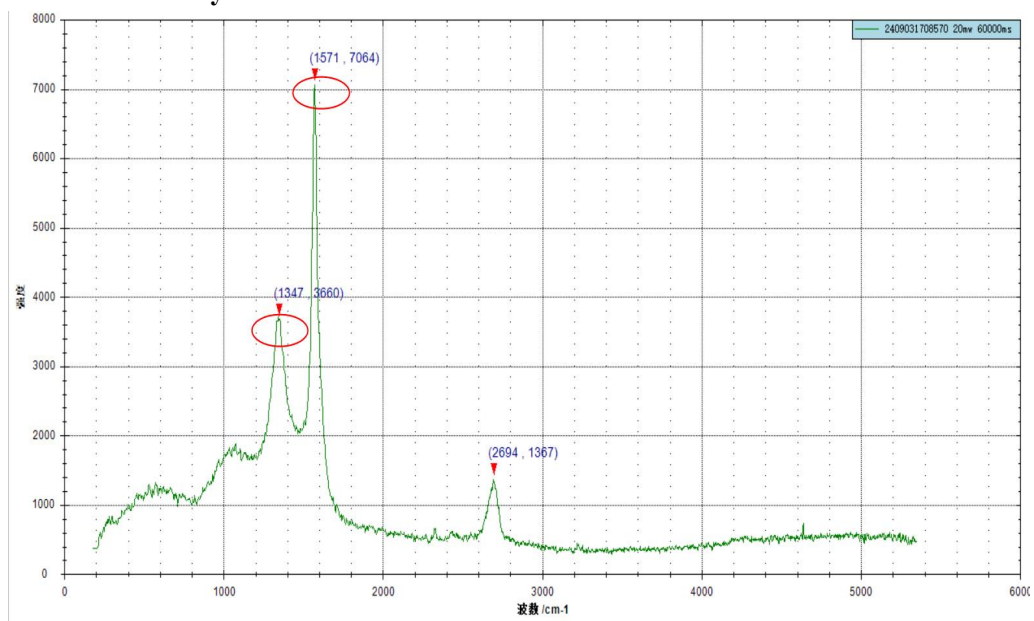
Jewelry Testing



Spectra of Different Gemstones

Testing various gemstones, spectral analysis reveals differences in chemical composition or crystal characteristics in different color regions of the gemstones. The ATR2100 portable Raman spectrometer is suitable for rapid, high-precision analysis of jewelry samples. Raman spectroscopy is an important non-destructive testing method in the jewelry industry, applicable for composition identification, quality assessment, and authenticity verification.

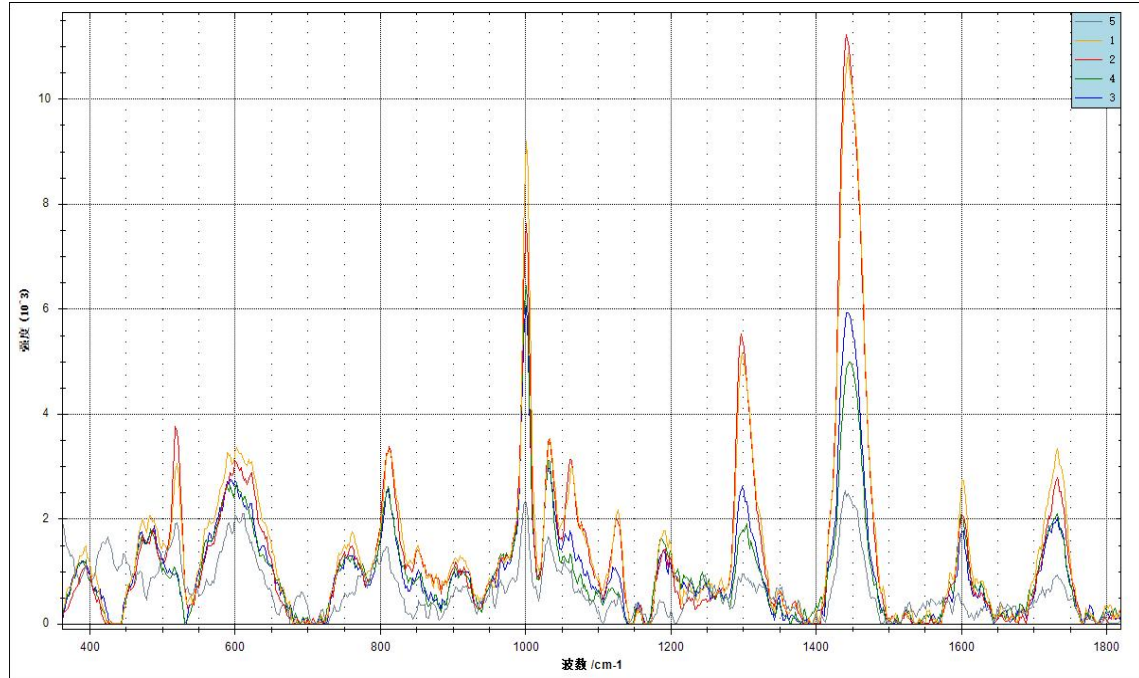
Carbon Material Analysis



Graphite Powder Test Spectrum

The ATR2100 tested graphite powder, and spectral analysis clearly shows the typical D peak ($\sim 1350\text{ cm}^{-1}$), G peak ($\sim 1580\text{ cm}^{-1}$), and 2D peak ($\sim 2700\text{ cm}^{-1}$) of graphite powder. The defect level of graphite powder can be analyzed based on the D/G peak intensity ratio.

Plastic Polymer Analysis



Plastic Polymer Test Spectrum

The ATR2100 tested five different positions of a plastic polymer sample. Spectral analysis reveals that all five positions exhibit the Raman characteristic peak of the benzene ring at 1605 cm^{-1} , with significant differences in intensity.