

Confocal Raman Microscope

ATR8100

Features

- Ultra-high sensitivity, SNR >2000:1;
- HD capacitive touch screen;
- Windows operating system;
- Built-in lithium battery;
- Quick positioning and focus;
- Micron-level light spot;
- 5 million pixel cameras with clear image
- Excitation wavelength: 532, 633, 785, 830, 1064nm optional;
- Equipped with high-performance spectrometer

Application

- Nanoparticles And New Materials
- Universities And Research Institutes
- Biotechnology : Biological Sciences
- Biopharma : Forensic Medicine Identification
- Material Science
- Chemistry : Medical Immunoassay
- Agriculture And Food Identification : Food & Beverage
- Water Pollution Analysis
- Energy: Gem And Inorganic Mineral Identification
- Environment: Environmental Science

Description

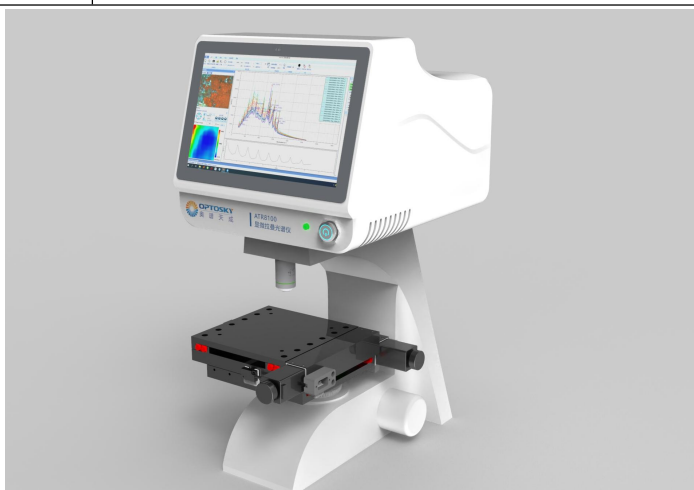
The ATR8100 Confocal Raman Microscope combines the advantages of microscopes and Raman spectrometers. The Raman microscope detection platform is a visual and precise positioning Raman detection platform, which allows the user to detect the Raman signals of different surface states on the sample, and can be displayed simultaneously on the computer, which is greatly Facilitates Raman micro-area detection.

ATR8100 raman instrument is equipped with an objective lens specially designed for the Raman system, which makes the laser spot close to the diffraction limit. The focus information is accurately and intuitively displayed on the computer through a 5-megapixel camera, which improves the quality of the Raman spectrum.

ATR8100 adopts a unique moving part without optical path switching (patented), which perfectly solves the loss of optical path for camera imaging, realizes the separation of camera imaging and Raman signal collection, and obtains the best signal strength.

At the same time, ATR8100 uses high-performance Raman specially optimized for micro-Raman systems. It is industry-leading in terms of sensitivity, SNR, stability, etc., providing a strong guarantee for Raman research.

Model	Feature
ATR8100BS	Base
ATR8100AF	Auto Focus
ATR8100MP	Mapping type (highest configuration, auto-focus, auto-scan)



1. Selection guide

Table 1 ATR8800 product selection table

Model	Excitation Wavelength	Laser Power/mW	Minimum starting wave number	Maximum wave number range	minimum resolution/cm ⁻¹
ATR8100-532	532 nm	100mW	100 cm ⁻¹	3200cm ⁻¹	5~9
ATR8100-638	638 nm	80mW	100 cm ⁻¹	3200cm ⁻¹	5~9
ATR8100-785-27	785 nm	350mW	100 cm ⁻¹	2500cm ⁻¹	3~6
ATR8100-785-35			100 cm ⁻¹	3300cm ⁻¹	5~8
ATR8100-785-40			100 cm ⁻¹	3800 cm ⁻¹	8~11
ATR8100-1064	1064 nm	600mW	100 cm ⁻¹	2300 cm ⁻¹	10~15
ATR8100DC	The detector is cooled to -70°C; SNR up to 11000:1; Integration time up to 1.2 hours; Adapt to excitation wavelengths 532, 638, 785, 830nm,etc				
ATR8100LT	The detector is cooled to -20°C; SNR up to 1500:1; Integration time up to 1.3h; Better dark current; Adapt to excitation wavelengths 532, 638, 785, 830nm,etc				

Ordering Guide:

Example:

ATR8100AF-Pro-532: autofocus, cooled type, excitation wavelength 532nm

ATR8800MP-Pro-1064: scanning imaging, long integration time detector, excitation wavelength 1064nm

2. Technical parameters

ATR8100-785	
Resolution	3-6 cm ⁻¹ (Customized slit & range)
Spectral range	250~2700, 200~3500, 200~4300 cm ⁻¹ (Customized from 50 cm ⁻¹ and above)
Spectral Stability	$\sigma/\mu < 0.5\%$ (COT 8 hours)
Temperature Stability	Spectral shift ≤ 1 cm ⁻¹ (10~40 °C)
SNR	>2000:1
Interface	USB2.0
Detector	2048 Pixel
Spectrometer Range	200nm~1100nm
Pixel Size	14 μm * 14 μm
Detector Dynamic Range	13000:1
Laser	785nm ($\pm 0.5\text{nm}$)
Microscope Camera	5-mega pixel Camera
Focus	conjugate focus
Laser Power	>350mW (Software Adjustable)
Laser Spot Diameter	>1 μm

Laser Stability	$\sigma/\mu < \pm 0.2\%$
Laser Linewidth	0.08 nm
X/Y Axis Stage	
Moving Range	50 X 50 mm
Moving Resolution	0.1 μ m
Movement Method	Manual or Automated
Z Axis Stage	
Focus Accuracy	$\leq \pm 0.2 \mu\text{m}$
Maximum Stroke	20 mm
focus Mode	Manual or Automated
Battery Life	Built-in Li-battery, > 4 hours, and customized.

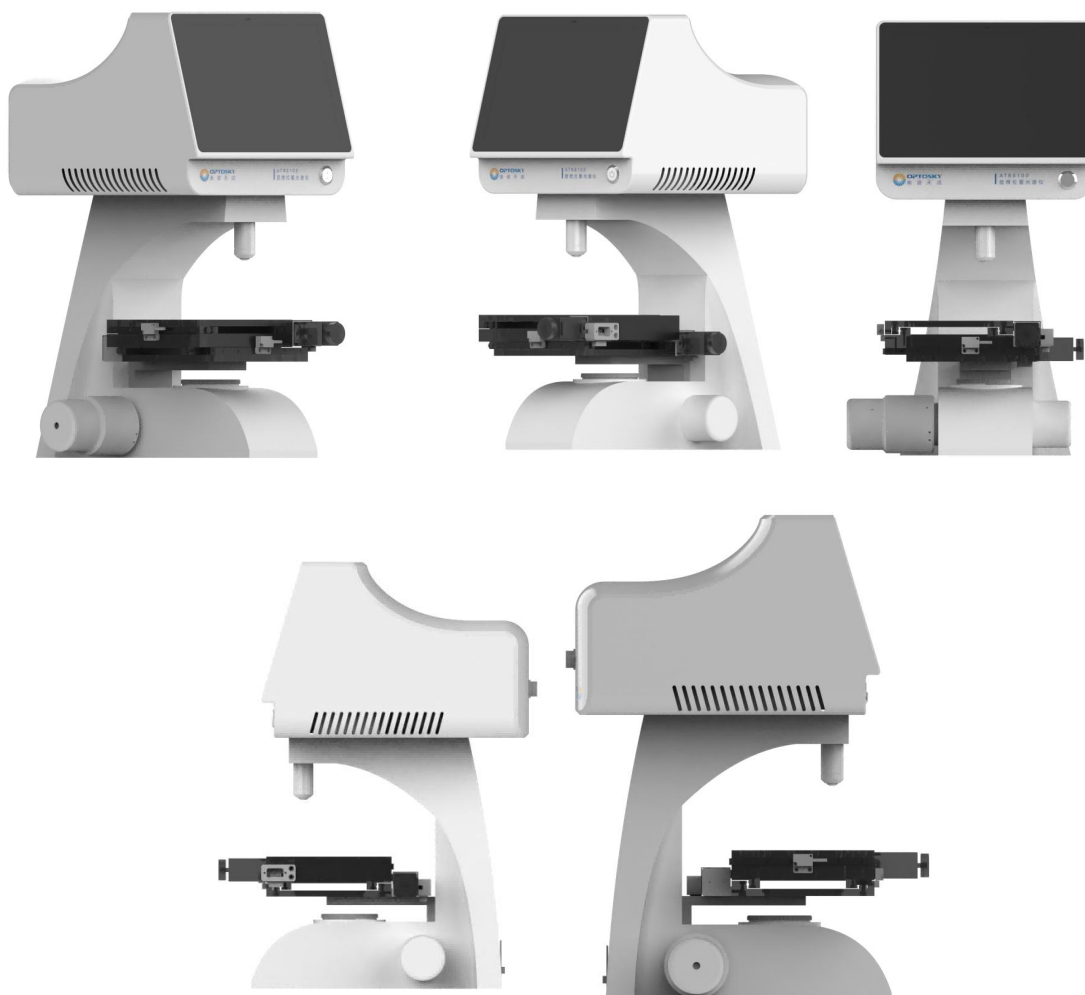


Figure 1 ATR8100 Microscope Raman functional structure indication diagram

3. Operating software interface

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

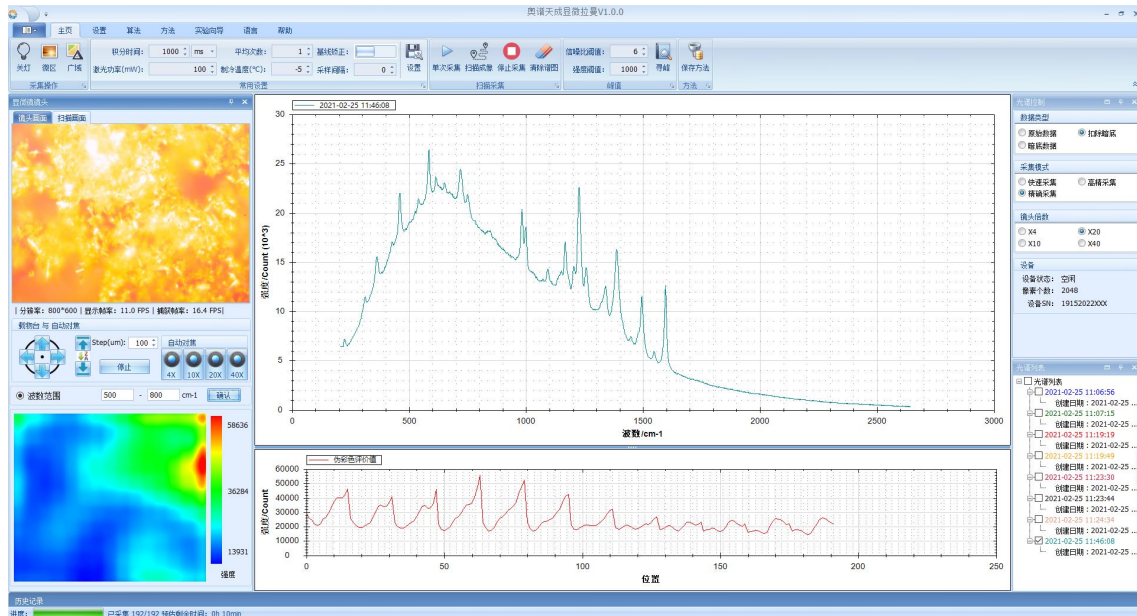


Figure 2 ATR8100 software interface

4. Optical properties

The optical path of ATR8100 has been extremely optimized. The optimized optical path efficiency has been increased by 8 times, and the signal-to-noise ratio has been increased by 8 times.

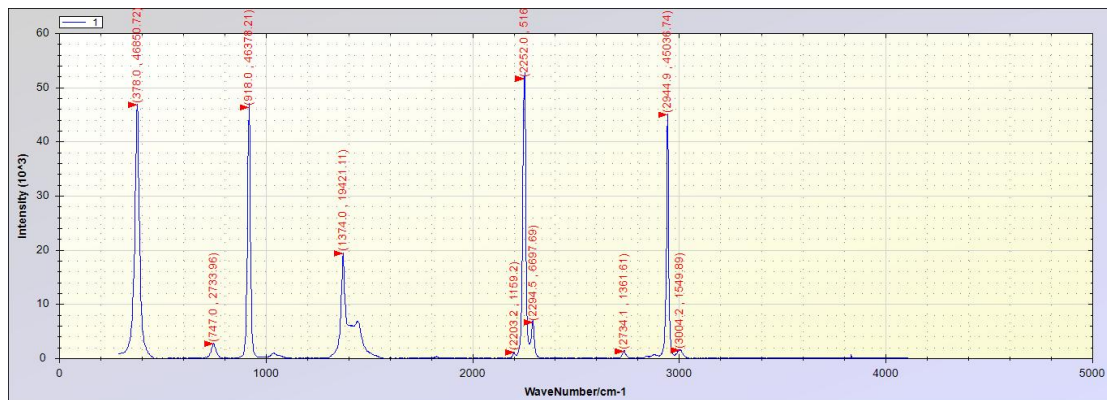


Figure 3 Raman spectrum curve test results; sample: acetonitrile, laser power: 130mW, measurement integration time: 4000ms.

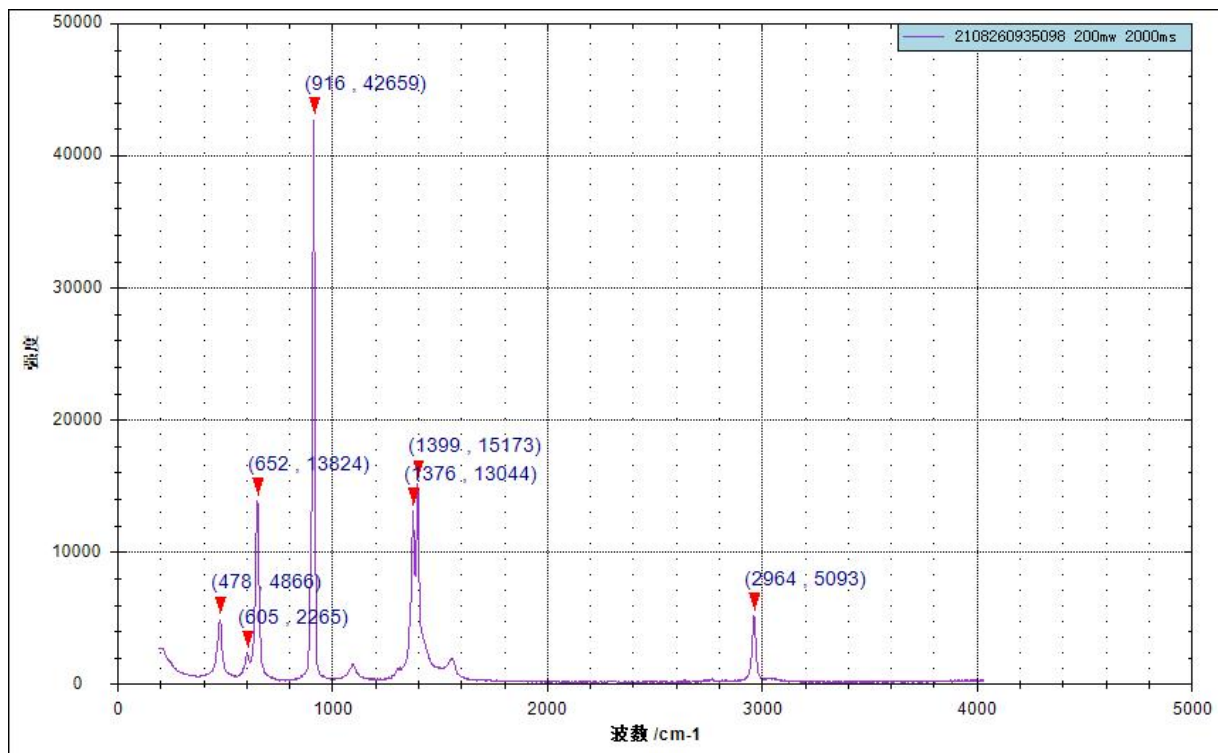


Figure 4 Raman spectrum of methane measured by ATR8100

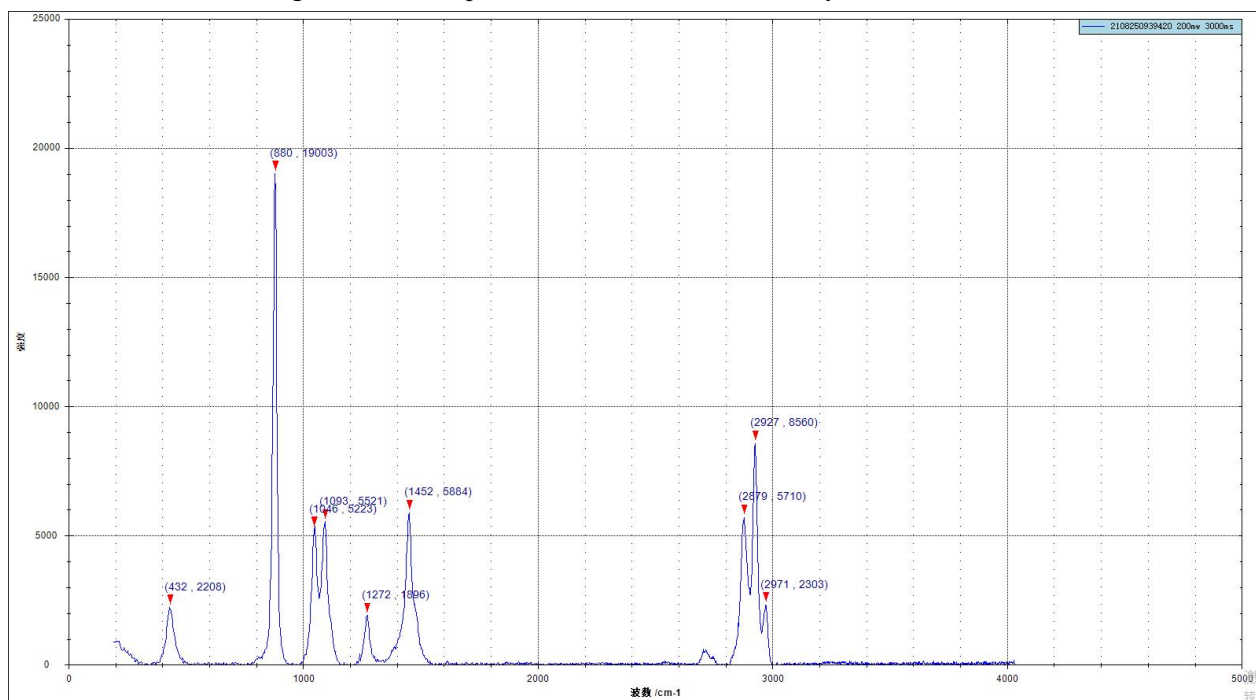


Figure 5 Raman spectrum of celecoxib measured by ATR8100

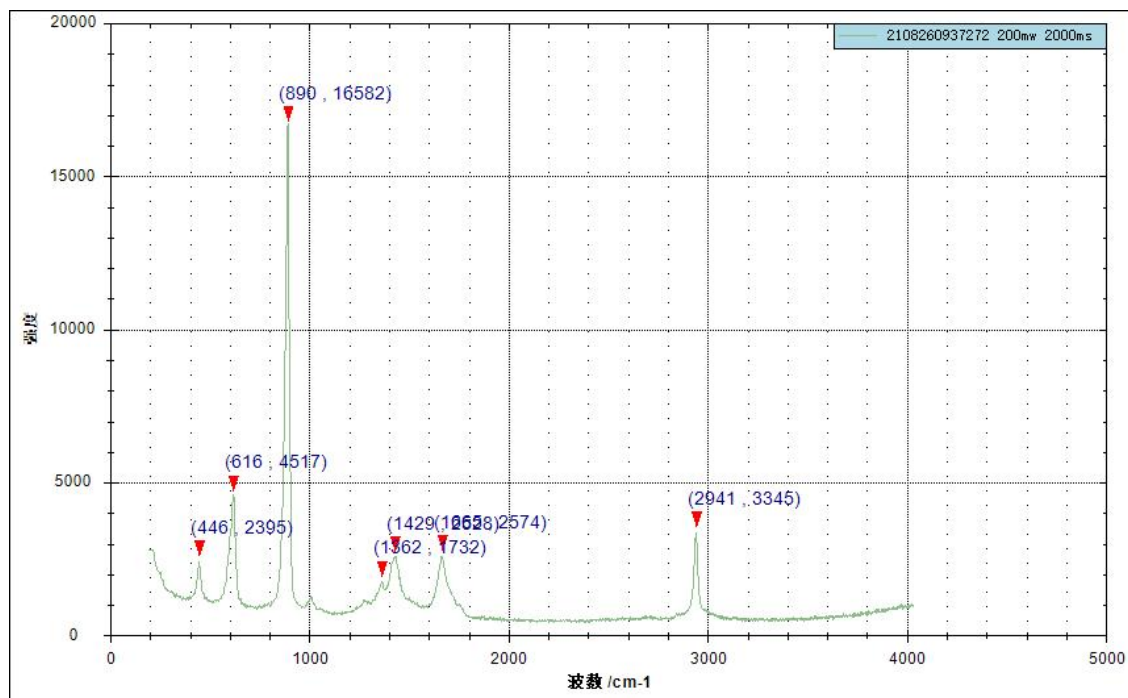


Figure 6 Raman spectrum of acetic acid measured by ATR8100

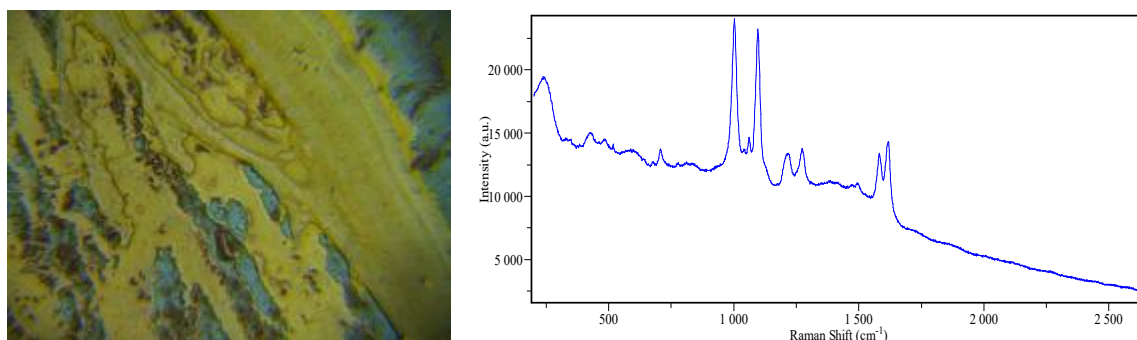


Figure 7 Sers experiment 1 performed by ATR8100 (the left picture is the sample picture, the right picture is the Sers Raman spectrum)

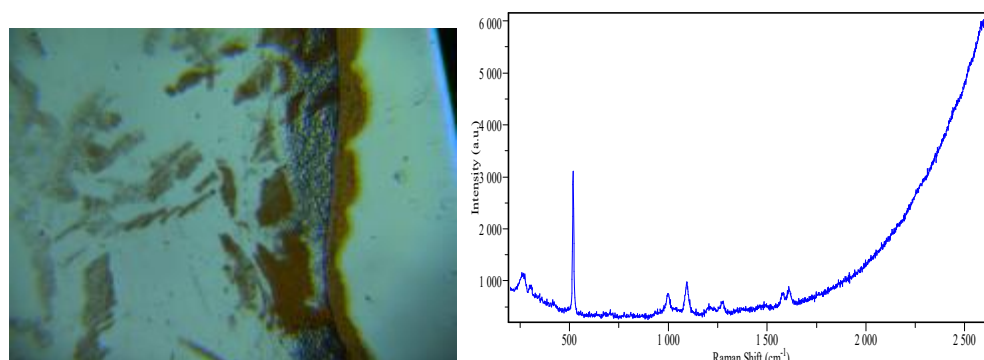


Figure 8 Sers experiment 2 performed by ATR8100 (the left picture is the sample picture, the right picture is the Sers Raman spectrum)

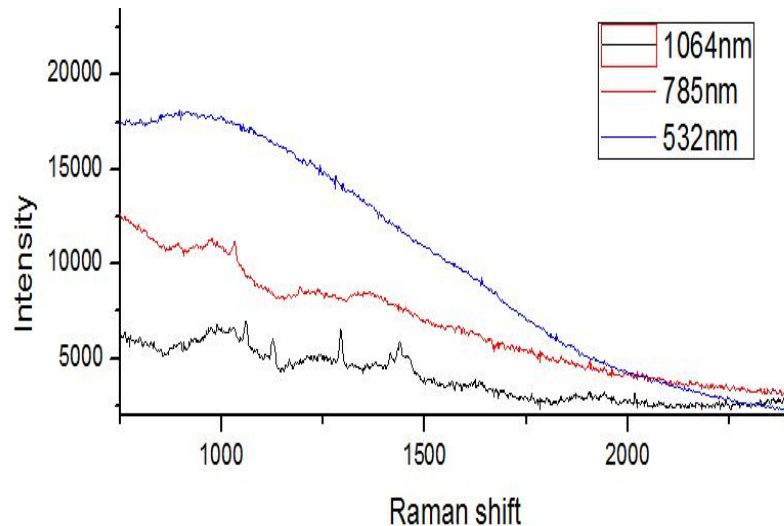
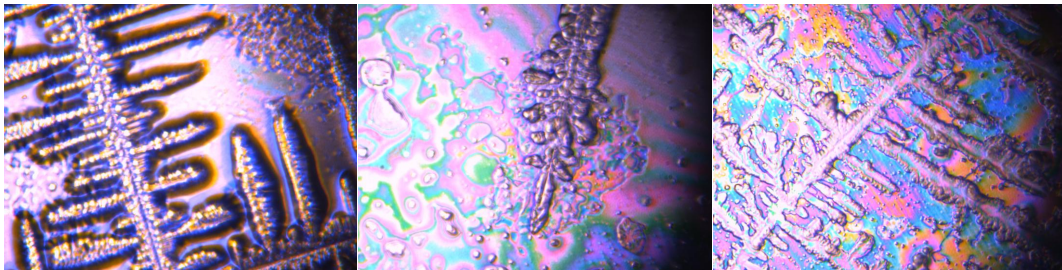


Figure 9 ATR8100 experiment to test cell metabolites. The top three pictures are surface morphology pictures, and the bottom picture is its Raman spectrum. They were tested with ATR8100-1064, ATR8100-785, and ATR8100-532 respectively.

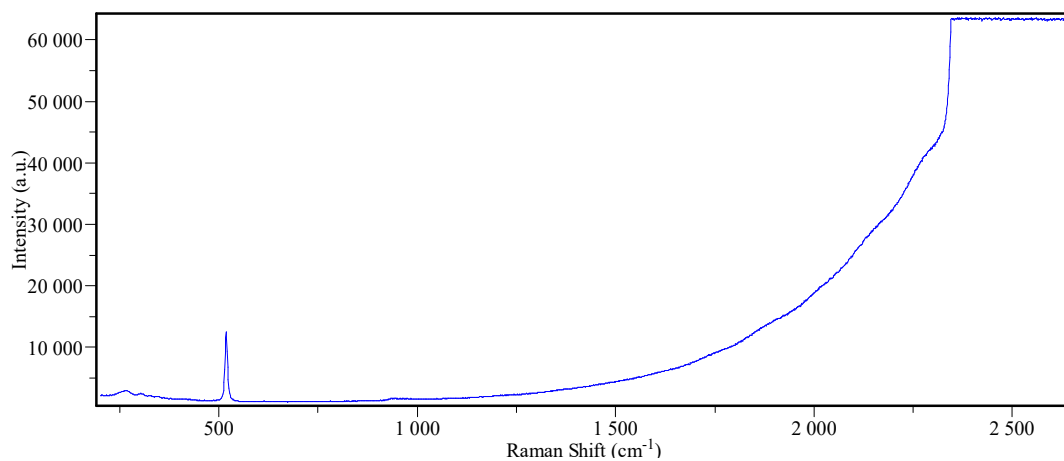


Figure 10 Raman spectrum of Si tested by ATR8100 (500mW, 1S integration time)

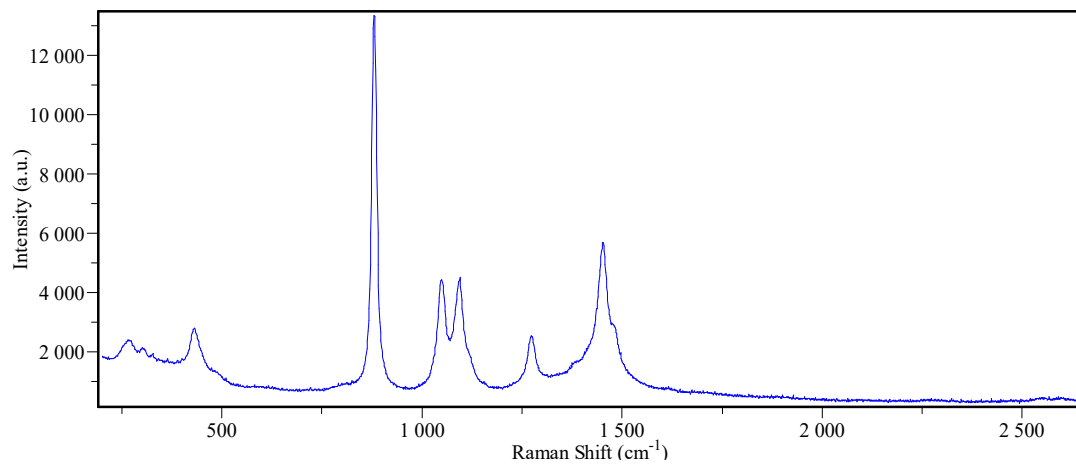


Figure 11 Raman spectrum of alcohol tested by ATR8100 (500mW, 1S integration time)

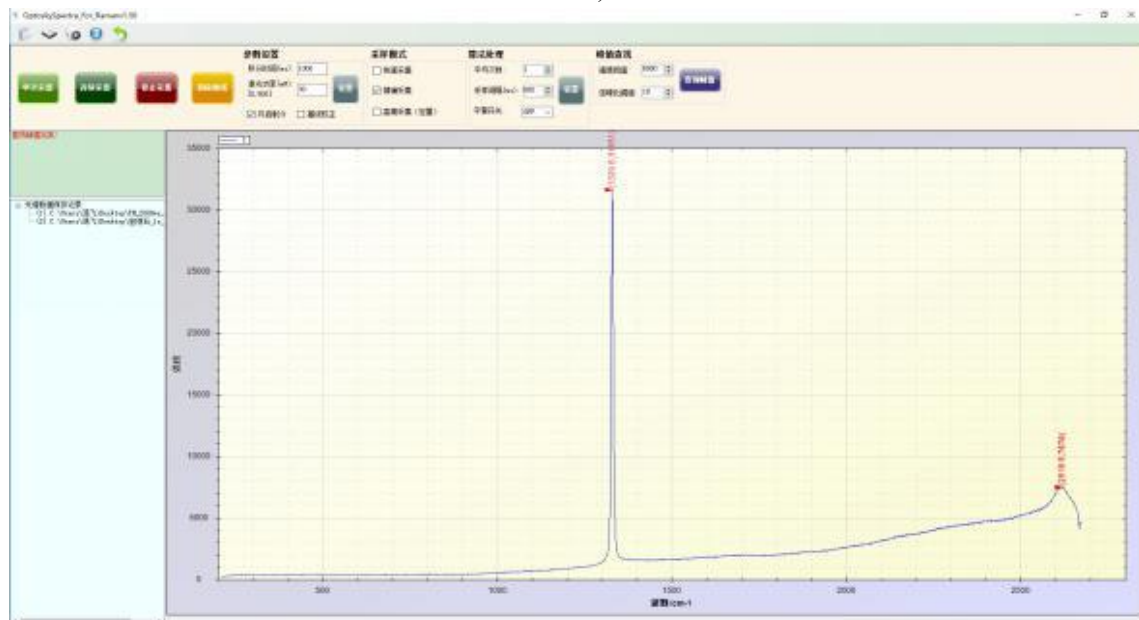


Figure 12 Raman spectrum of ATR8100 test diamond (30mW, 1S integration time)

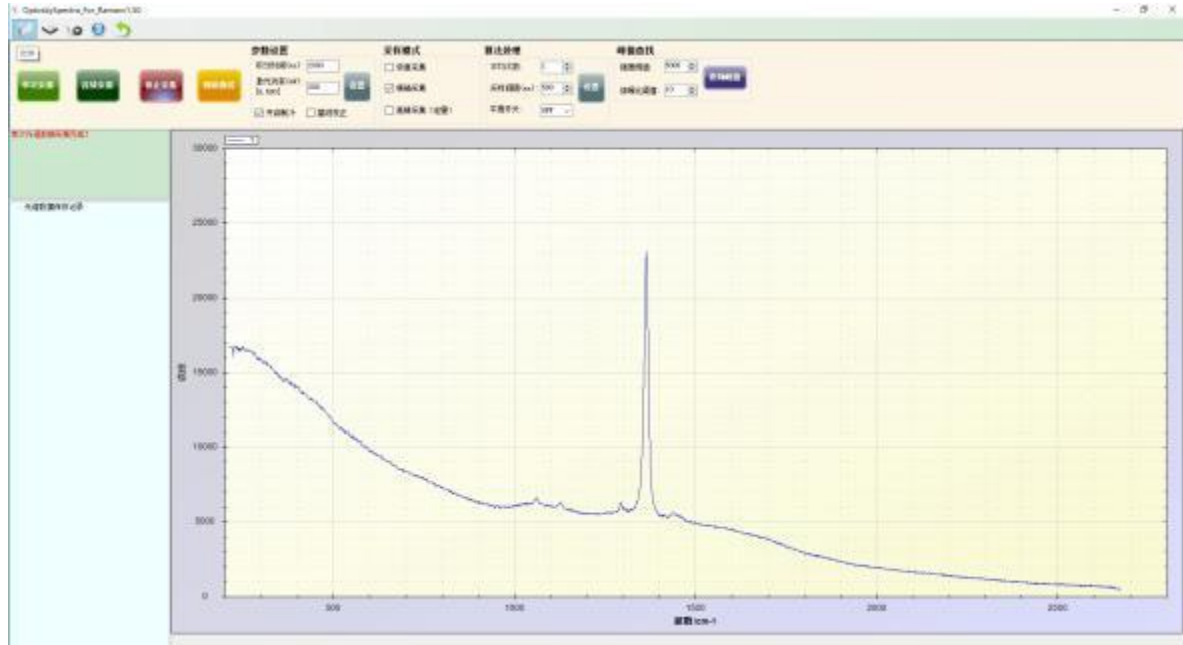


Figure 13 Raman spectrum of boron carbide (PN) tested by ATR8100 (200mW, 2S integration time)

5. Stability

The picture below is the temperature stability test of ATR8100, which is stable from 5-40°C. At each temperature node, the spectrometer remains in a stable state for more than 1 hour. The test sample is acetonitrile. The wave number drift is less than or equal to 1cm⁻¹, and the peak intensity change is less than 10%.

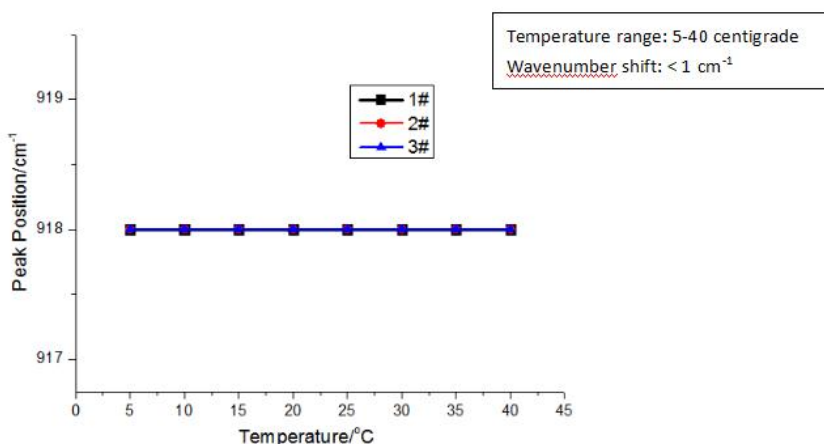


Fig. 3.1 Wavenumber shift results testing from 5 °C to 40 °C of five ATR2000 portable Raman spectrometers

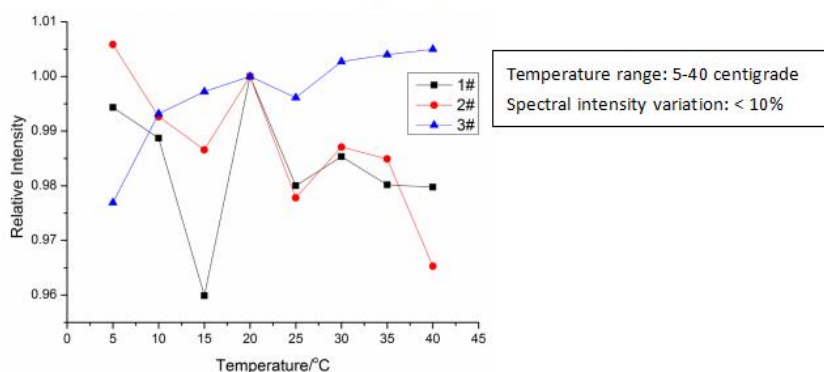


Fig. 3.2 Intensity variation testing from 5 °C to 40 °C of five ATR2000 portable Raman spectrometers

6. Ordering Information

Model	Excitation wavelength/nm	Maximum power /mW	Wave number range/cm ⁻¹	Resolution/cm ⁻¹
ATR8100-532	532	100	200~3700	5~7
ATR8100-638	638	80	200~3500	4~6
ATR8100-785	785	350	200~4000	6~10
ATR8100-1064	1064	600	200~2600	8~12
Other wavelengths can be customized				