

Raman Microscope (Mapping)

ATR8300MP

Feature:

- Full-automated, auto-focusing, auto-scan
- Ultra-high sensitivity
- True confocal, accurate Raman mapping
- Ultra-high spatial resolution
- Unique software controlled to switch optical path
- Ultra-high stability
- Excellent performance
- Fast positioning, quick locate focal position
- High quality objective, micro spot
- 3-mega/5-mega pixel camera, crisp clear images
- Excitation wavelength(Optional): 532,633, 785,830,1064
- High-performance spectrometer configured
- USB2.0 in direct connect with PC

Application:

- Nano particles and new materials
- Science research Institutions
- Bioscience
- Forensic identification
- Material science
- Medical immunology analysis
- Agriculture and food accreditation
- Gemstones & minerals identification

Description:

Optosky provides miniature Raman microscope integrating benefits of microscope and Raman spectrometer into one instrument. It becomes possible to see micro areas of samples on the computer screen with just a single mouse click. When the sample is visualized in accurate position, the observer scan Raman spectrum under various surface conditions, and synchronous Mapping can be displayed intuitively on the screen in a click. As a result, it takes great convenience to detect micro areas of samples. Combine unique patented conjugate focusing(true confocal) system with accurate image processing algorithm, and it enables a very small sample areas to be analyzed, as well as it requires minimal operator training and maintenance, yet resulting in uniform result not just spectrum.

ATR8300MP is equipped with tailor-made objective, and laser spot on the sample becomes very close to diffraction limit, then focal information can be displayed in accurate and intuitive on the screen with 3-megapixel/5-megapixel camera. This configuration improves Raman spectral quality for overcoming the limitations of Raman systems where the focal plane for Raman signal collection is slightly above or below the imaging plane.

ATR8300MP works very stable with no moving components of optical path switch, hence it avoids loss off optical path while imaging being formed, and it gains optimized signal for separating imaging formed from Raman signal collection.



Fig. 1 ATR8300 Structure indication diagram



Models	Functions
ATR8300BS	Basic Configuration
ATR8300AF	Auto Focus
ATR8300MP	Mapping, (higher configuration, auto-focus, auto-scan)

ATR8300MP Raman Microscope Mapping	
Excitation wavelength	785 nm (532,633,830,1064 nm options)
Spectral resolution	4-9 cm ⁻¹
Spectral range	250-2700, 200-3500, 200-4300 cm ⁻¹ (available in customer wavelengths range down to 50 cm ⁻¹)
Maximum laser output	500mW (Max. 100mW for 532nm)
Spectral Stability	$\sigma/\mu < 0.5\%$ (COT 8 hours)
Thermal stability	Spectral shift ≤ 1 cm ⁻¹ (10-40 °C)
SN ratio	>6000:1
Detector	TE cooled, semiconductor laser, 2048*64 pixel, back-thinned, IR enhanced CCD InGaAS cooled for 1064nm
wavelength range detected	200nm-1100nm
Pixel size	14 μ m * 14 μ m
Dynamic range	13000:1
Laser center wavelength	785nm (+/-0.5nm)
Microscope camera	3-megapixel /5-megapixel camera
focusing	True confocal
Laser output	>550mW (software adjustable)
laser spot diameter	>1 μ m
Laser stability	$\sigma/\mu < \pm 0.2\%$
Laser linewidth	0.08 nm
Connectivity	USB2.0
Electrical controlled X,Y axis 2D platform	
moving range	5 X 5 cm
moving resolution	0.1 μ m
positioning accuracy	1 μ m
Scan speed	20mm/s
Z axis (automated focusing)	
focusing accuracy	$\leq \pm 0.2\mu$ m
Max. range	20mm
focusing speed	Less than 10 s

2. Optical performance

2.1 Spectrum

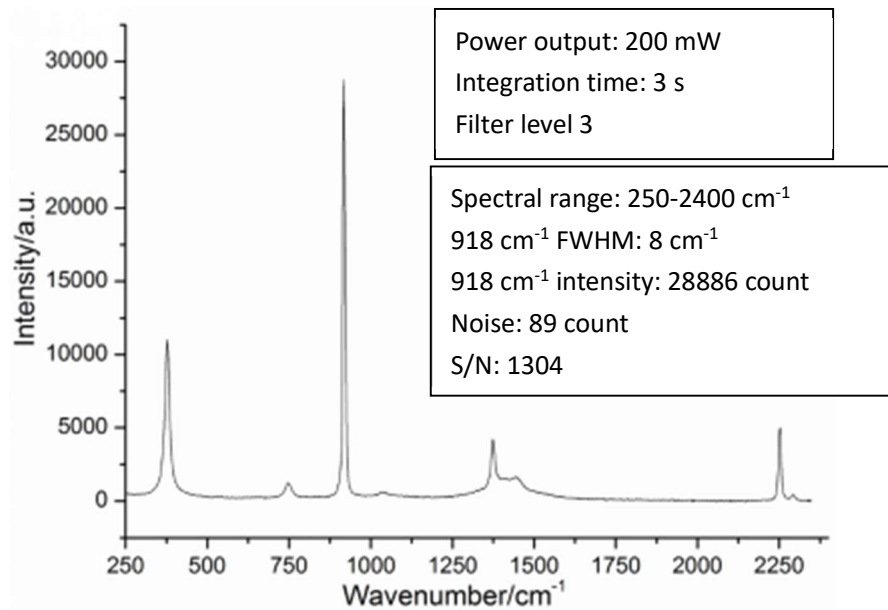


Fig. 2 ATR8300 collect acetonitrile spectra

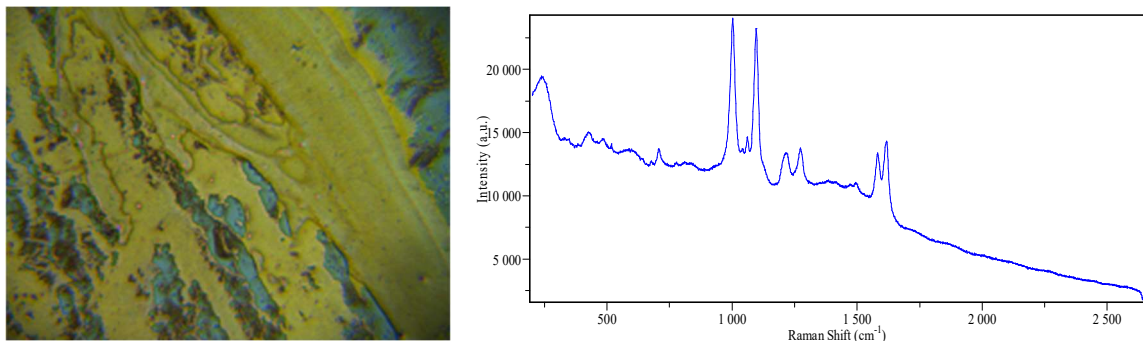
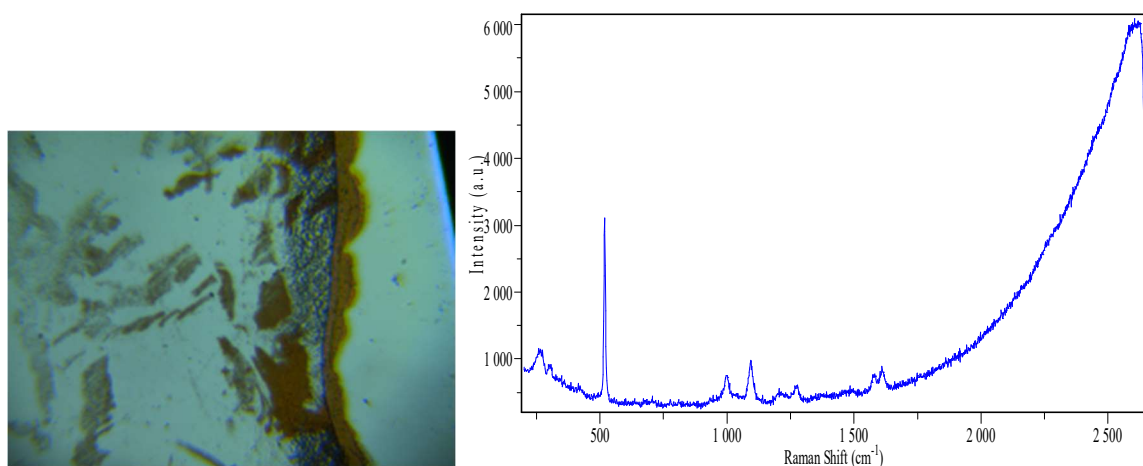


Fig.2 ATR8300 Sers experiment 1 (Left picture is sample, and right picture is Sers Raman spectra)



ATR8300 Sers experiment 2 (left picture is sample, right picture is Sers Raman spectra)

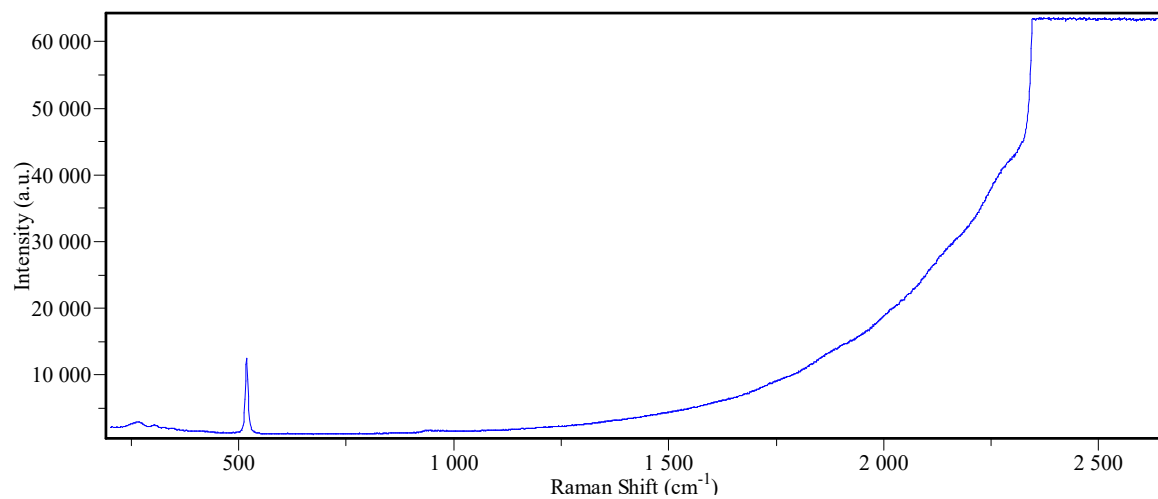


Fig 3 ATR8300 Measure Si Raman spectra (500mW, integration time: 1S)

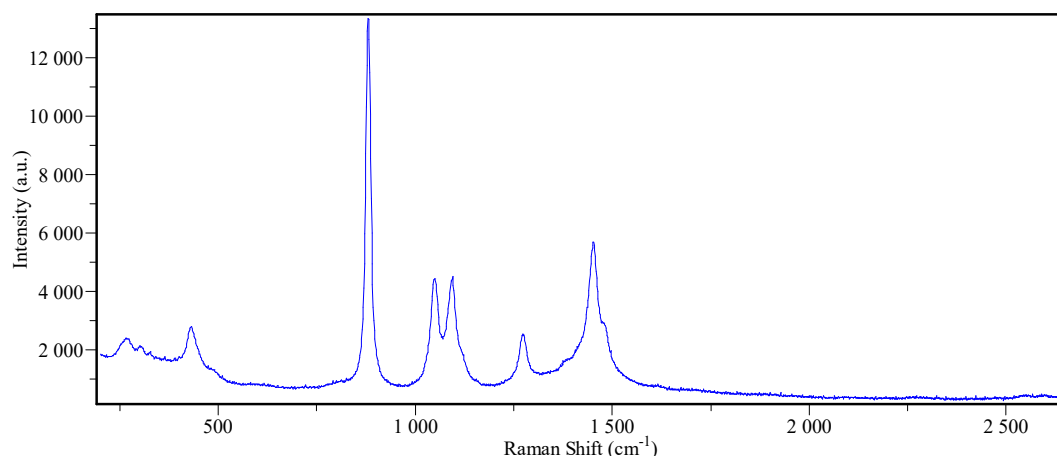


Fig 4 ATR8300 measure alcohol spectra (500mW, integration time:1S)

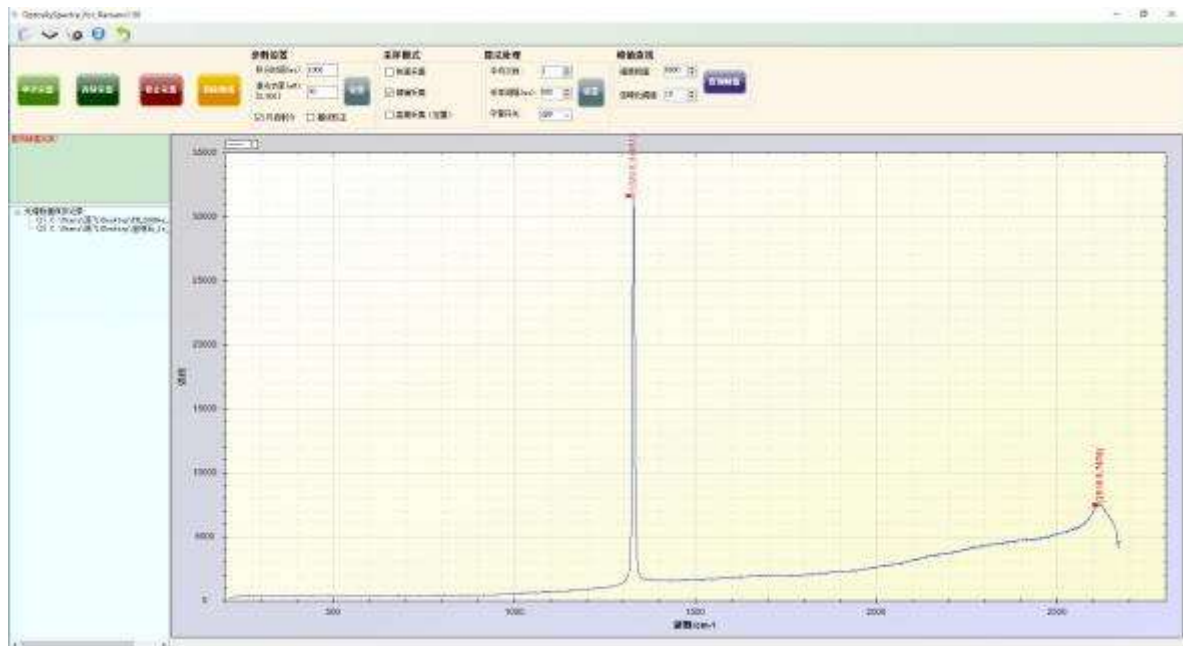


Fig 5 ATR8300 measure diamond Raman spectra (30mW, integration time: 1S)

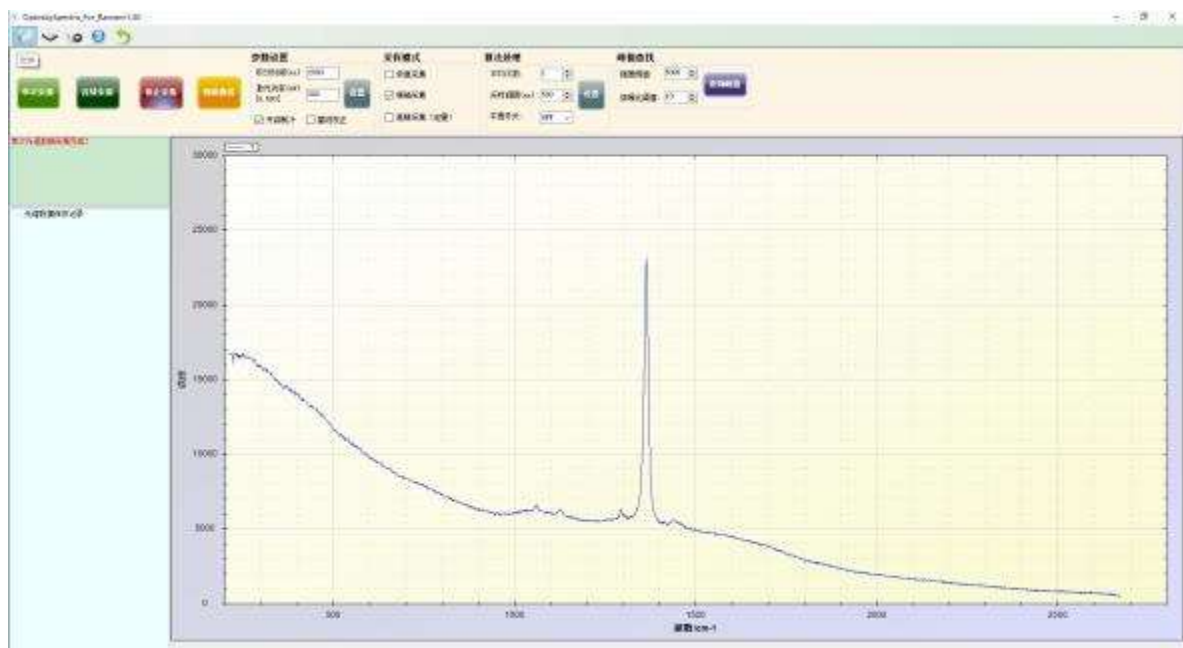


Fig 6 ATR8300 measure boron carbide (PN) spectra (200mW, integration time: 2S)

2.2 Raman resolution

2.2.1 Tylenol Raman spectra

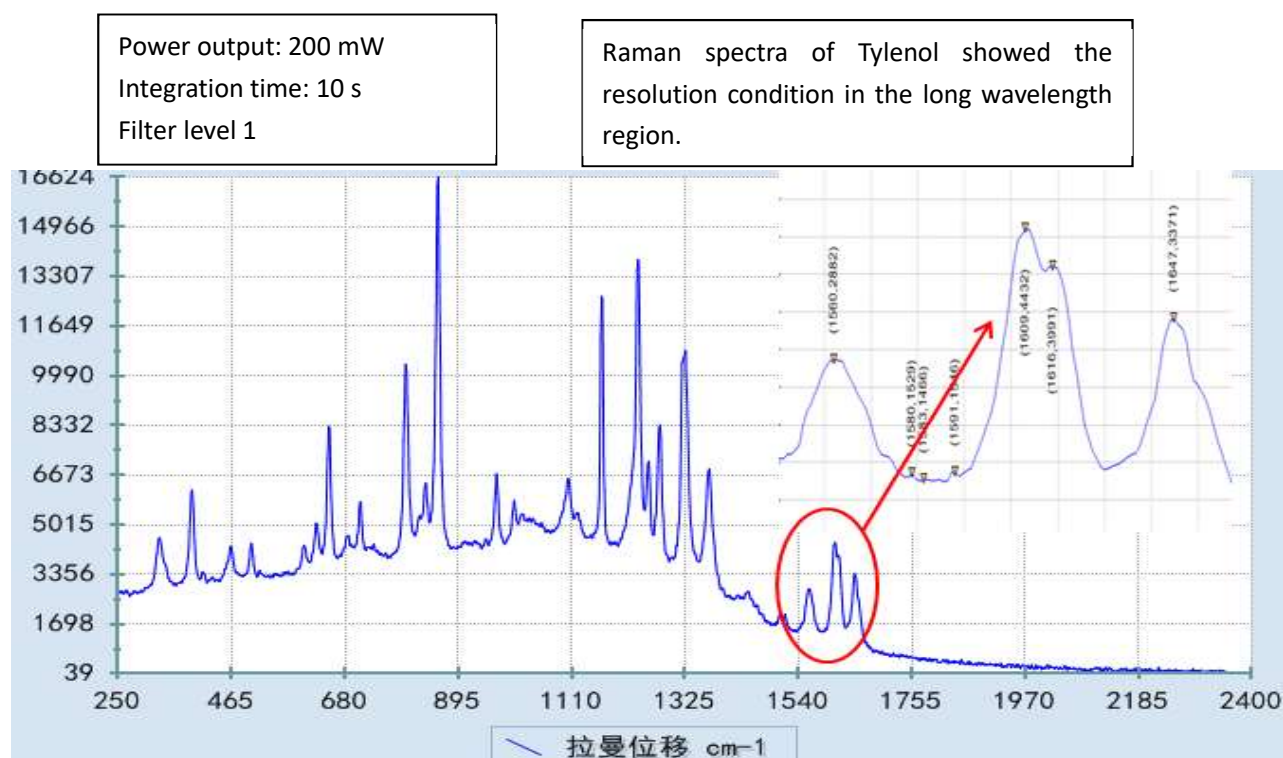


Fig 7 Tylenol spectra shows clear 1610/1615 cm^{-1} vibration peak

2.2.2 Petrol Raman spectra

Power output: 200 mW
Integration time: 10 s
Filter level 1

Raman spectra of 93# petrol showed the resolution condition in the long wavelength region.

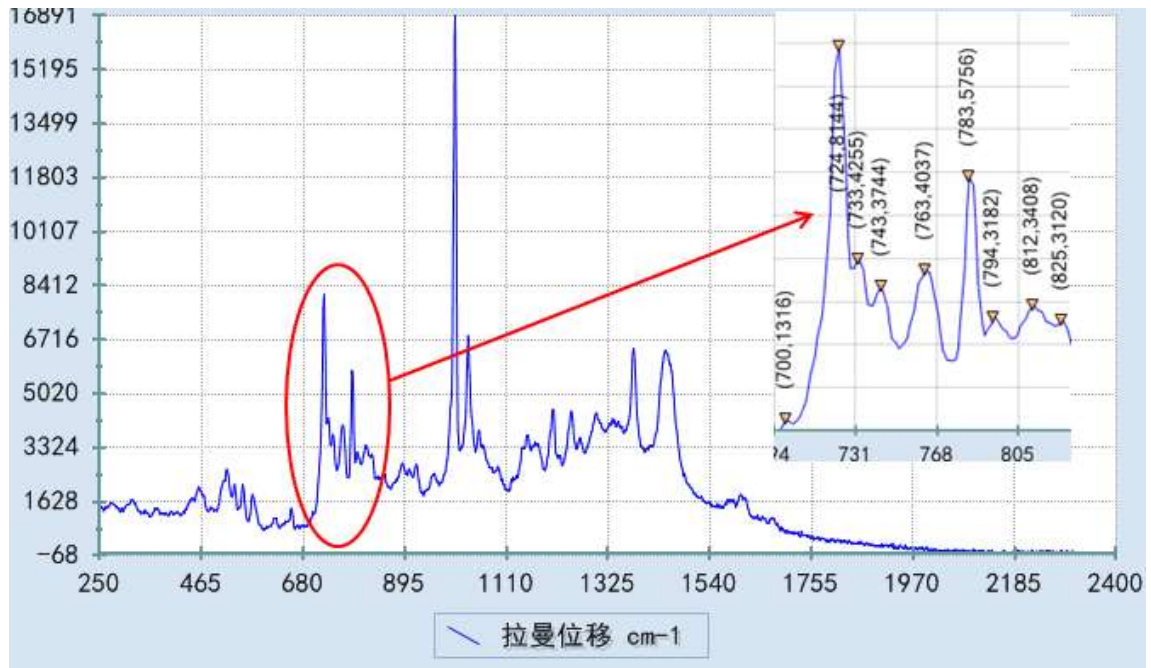


Fig 8 93# petrol Raman spectra, 723/732/742 cm^{-1} spectral shift is clearly recognized

3Reliability

Fig3.1, Fig3.2 temperature stability is measured by ATR8300, keep stable above an hour for each temperature node ranging between 5-40°C. Sample measured is acetonitrile, wavenumbers shift $\leq 1\text{cm}^{-1}$ (Fig 3.1) , peak top intensity change < 10% (Fig 3.2)

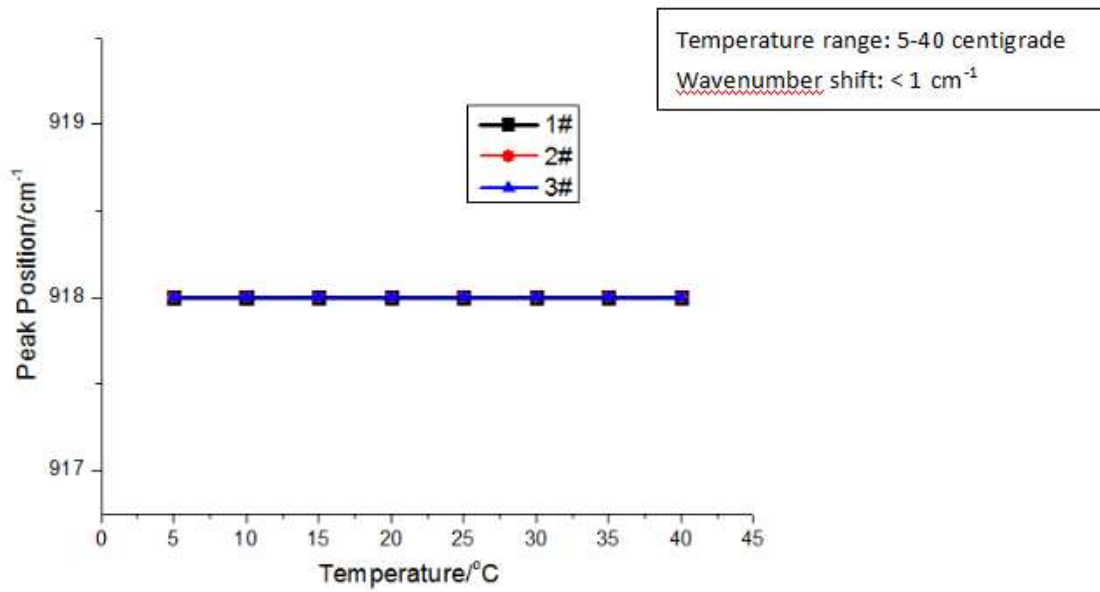


Fig. 3.1 Wavenumber shift results testing from 5 °C to 40 °C of five ATR2000 portable Raman spectrometers

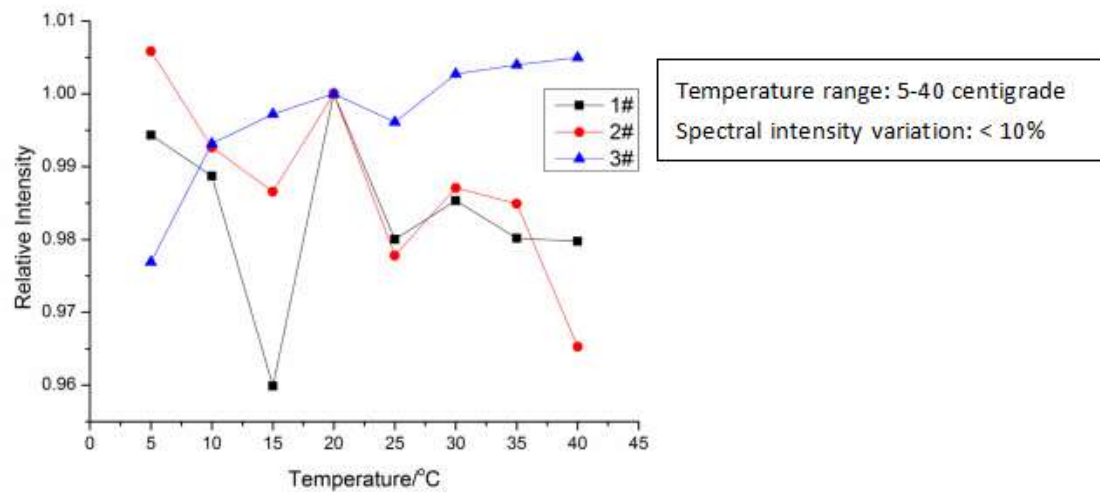


Fig. 3.2 Intensity variation testing from 5 °C to 40 °C of five ATR2000 portable Raman spectrometers

4 Order guide

Model	Excitation wavelength*1/nm	Power /mW	Wavenumber range/cm ⁻¹	Resolution*2/cm ⁻¹
ATR8300-532	532	100	200~3700	9-12
ATR8300-633	633	50	200~3500	9-12
ATR8300-785-27	785	600	250~2700	5
ATR8300-785-35			200~3500	6-8
ATR8300-785-43	785	600	200~4300	8-11
ATR8300-1064	1064	600	200~2600	12-15
ATR8300-1064-35	1064	600	200~3500	15-20

Note:

*1 Other wavelengths can be customized

*2 The spectrometer uses a narrow slit, which can effectively improve the resolution of the Raman spectrum, but it will reduce the sensitivity of the instrument. Therefore, if you need a high-resolution instrument, please specify when placing an order; Optosky's spectrometer is independently developed and produced, so Customized production is available to provide Raman spectrometers with various wavenumber ranges and resolutions. Due to limited space, we will not list them one by one. If necessary, please consult our sales engineers.

*3 The parameters in the table only represent the standard product parameters of Optosky; for other parameters, Optosky can provide comprehensive and sufficient customized services.

Example: The actual final model code is: ATR8300MF-785-35

5. Details

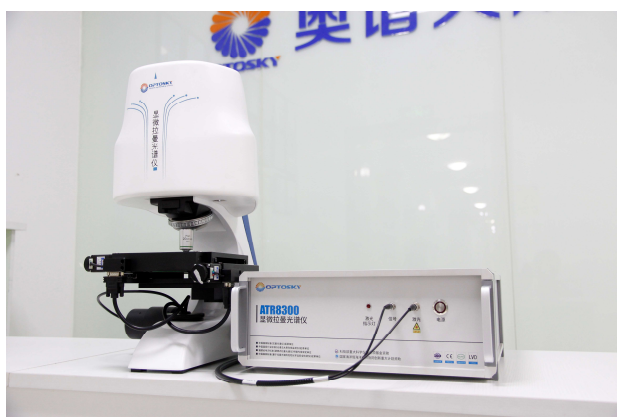


Fig 9 branded high stable microscope platform; X、Y、Z-axis precision adjustable; Adjustable knob work smooth, weight up to 5.6 Kg, very stable.



Fig 10 Raman signal high transmission objective, objective focal length up to 8mm



Fig 11 Power button, button on/off as many as 1,000,000 times, high strength laser cable, signal cable is very strong, and laser indicator can intuitively display operating status.



Fig 12 Simple interface: Raman spectrometer: power socket +USB2.0 connector

6. Successful customers

