Electro Optical Components, Inc.
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Click to go to Product Selector

DATASHEET
EOC-SI-R8300MP
Mapping Raman Microscope

Description

EOC-SI-R88300MP is a 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 can scan Raman spectrum under various surface conditions, and synchronous Mapping can be displayed intuitively on the screen in a click. As a result, it offers great convenience to detect micro areas of samples. Combine unique patented conjugate focusing (true confocal) system with accurate image processing algorithm, and it enables 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.

EOC-SI-R8300MP 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.

EOC-SI-R8300MP is very stable with no moving components of optical path switch, hence it avoids loss off optical path while imaging is being formed, and it gains optimized signal for separating imaging formed from Raman signal collection.

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

Fig. 1 EOC-SI-R8300MP structure indication diagram

Models	Functions
EOC-SI-8300BS	Basic Configuration
EOC-SI-8300AF	Auto Focus
EOC-SI-8300MP	Mapping, (higher configuration, auto-focus, auto-scan)

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EOC-SI-R8300MP 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	σ/μ < 0.5% (COT 8 hours)
Thermal stability	Spectral shift ≤ 1 cm-1 (10-40 ℃)
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 μm * 14 μm
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	>1μm
Laser stability	σ/μ <±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	0.1μm
positioning accuracy	1μm
Scan speed	20mm/s
Z axis（automated focusing）	
focusing accuracy	≤ ±0.2μm
Max. range	20mm
focusing speed	Less than 10 s

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2. Optical performance

2.1 Spectrum

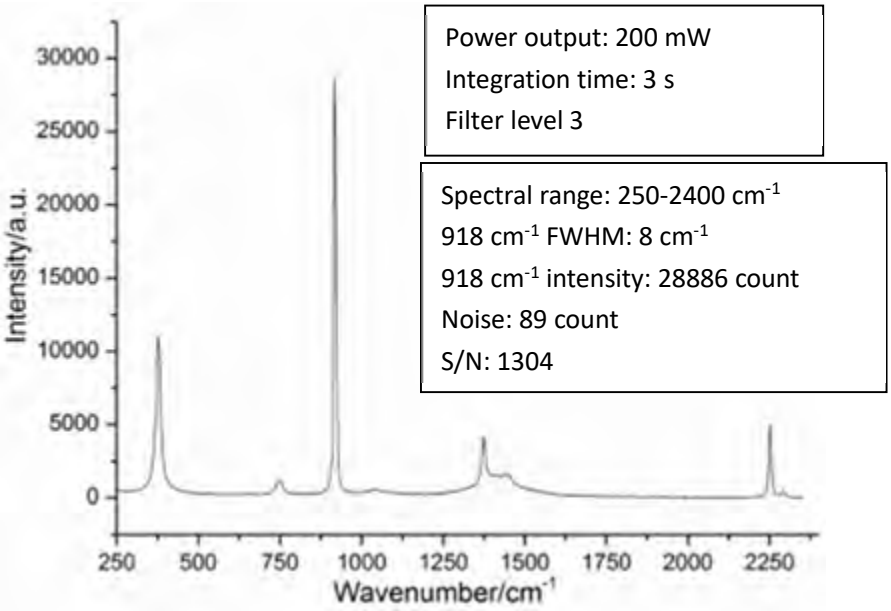
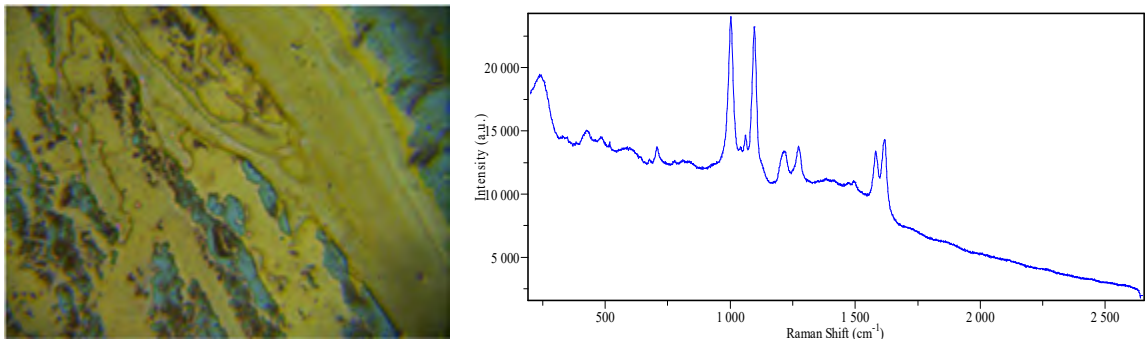


Fig. 2 EOC-SI-R8300MP collect acetonitrile spectra



EOC-SI-R8300MP Sers experiment 1: Left picture is sample, and right picture is Sers Raman spectra

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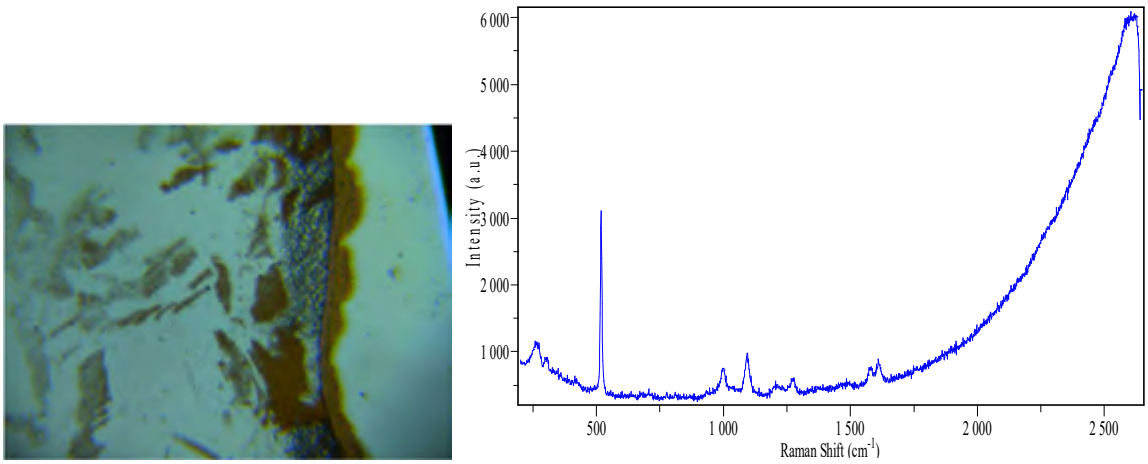
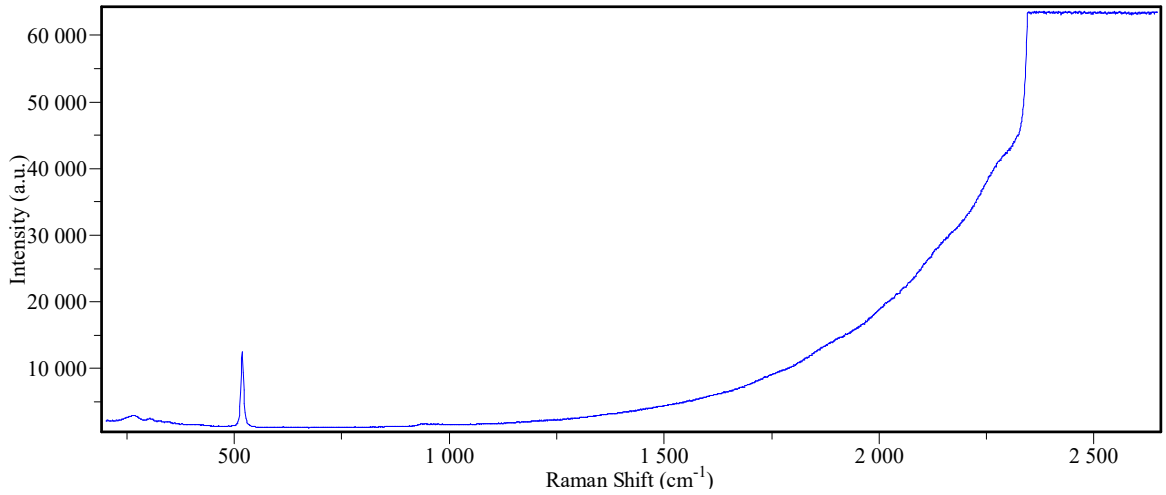
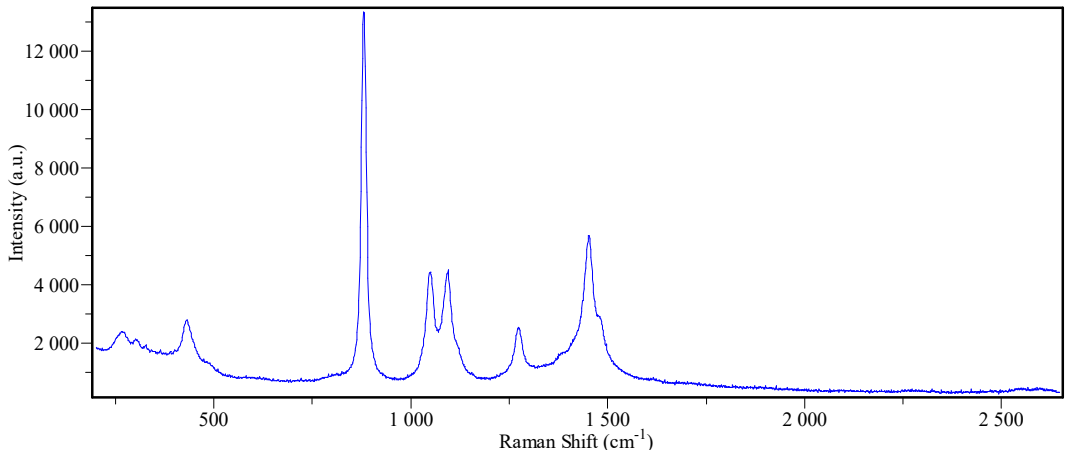


EOC-SI-R8300MP Sers experiment 2: left picture is sample, right picture is Sers Raman spectra



EOC-SI-R8300MP Measure Si Raman spectra 500mW, integration time: 1S



EOC-SI-R8300MP Measure alcohol spectra 500mW, integration time:1S

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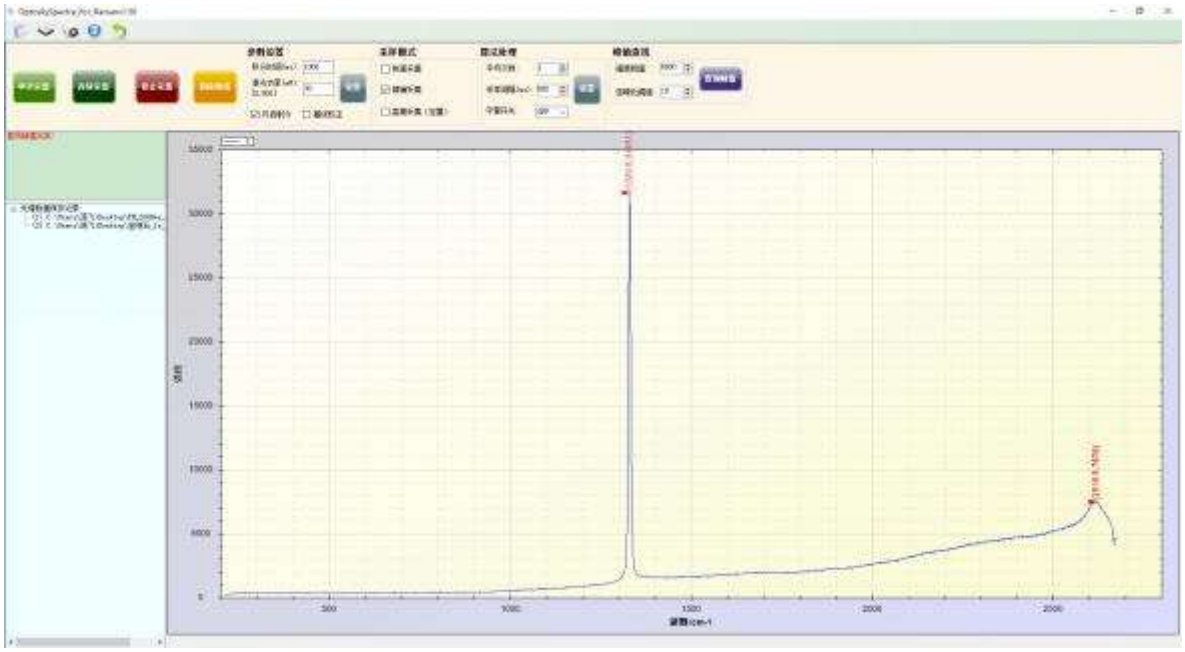
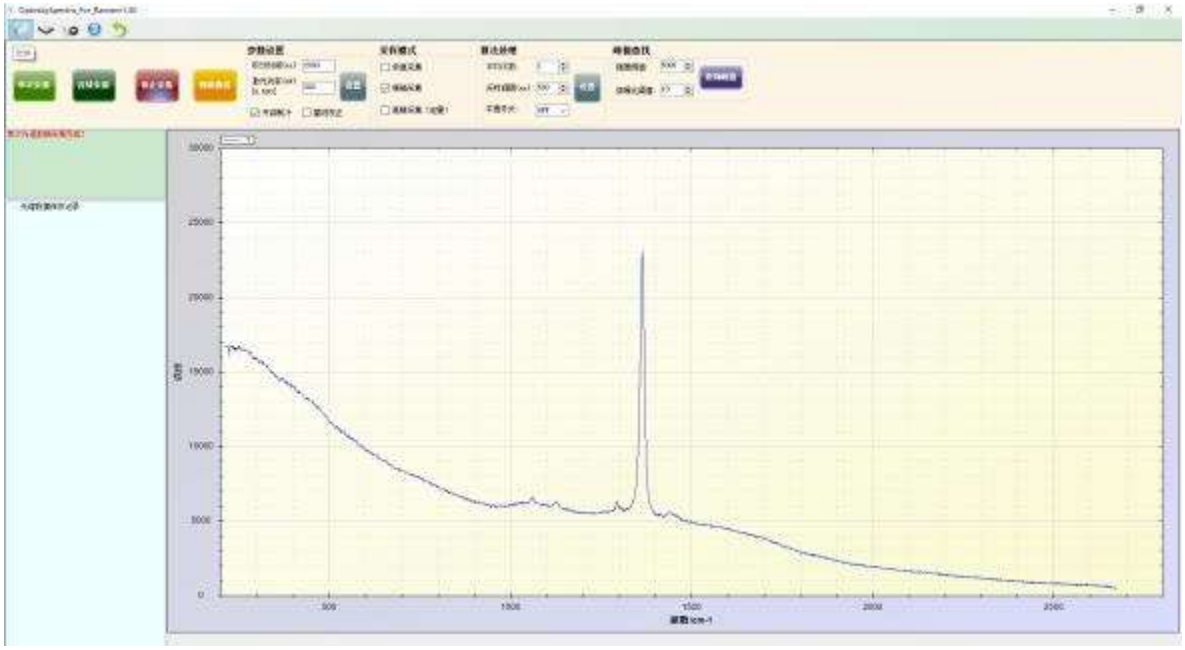


EOC-SI-R8300MP Measure diamond Raman spectra 30mW, integration time: 1S



EOC-SI-R8300MP measure boron carbide (PN) spectra (200mW, integration time: 2S)

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2.2 Raman resolution

2.2.1Tylenol Raman spectra

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

Raman spectra of Tylenol showed the resolution condition in the long wavelength region.

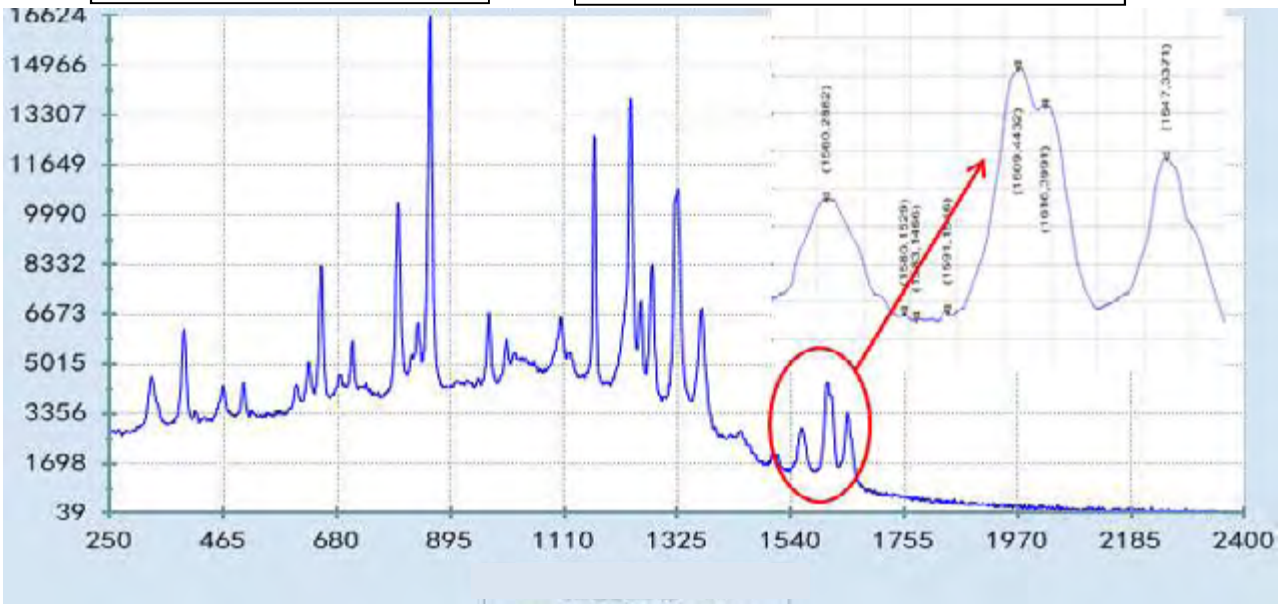

Fig 7 Tylenol spectra shows clear 1610/1615 cm^{-1}vibration peak

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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.

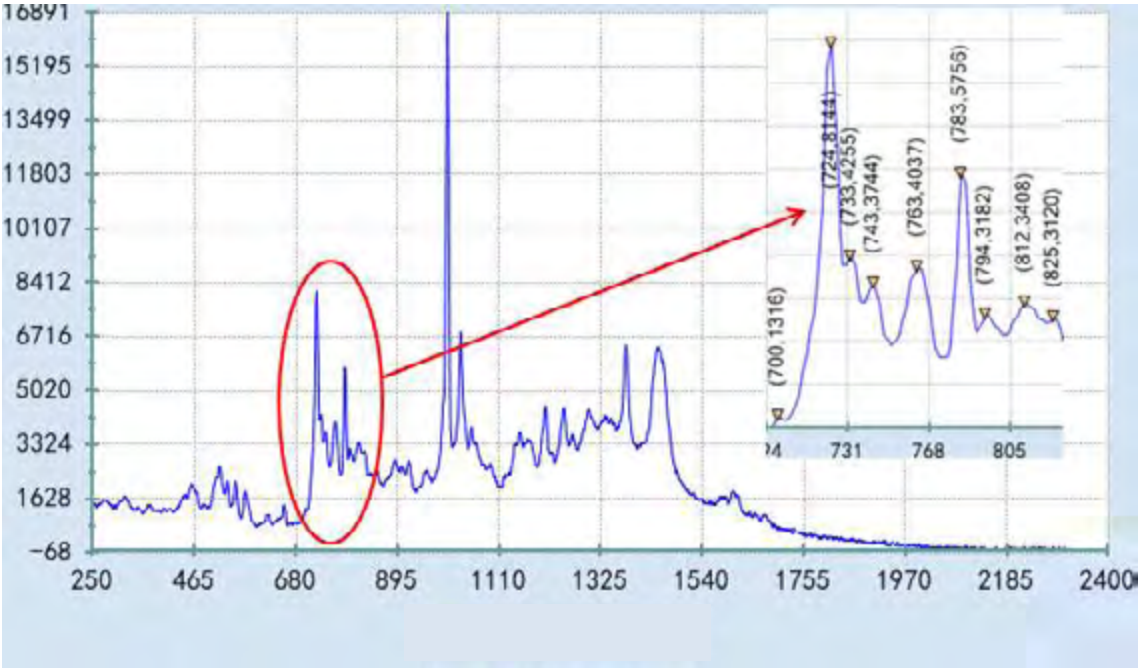

Fig 8 93# petrol Raman spectra, 723/732/742cm^{-1} spectral shift is clearly recognized

3Reliability

Fig3.1, Fig3.2 Temperature stability is measured by EOC-SI-R8300MP, kept stable above an hour for each temperature node ranging between 5-40°. Sample measured is acetonitrile, wavenumbers shift ≤1cm^{-1} (Fig 3.1), peak top intensity change < 10% (Fig 3.2).

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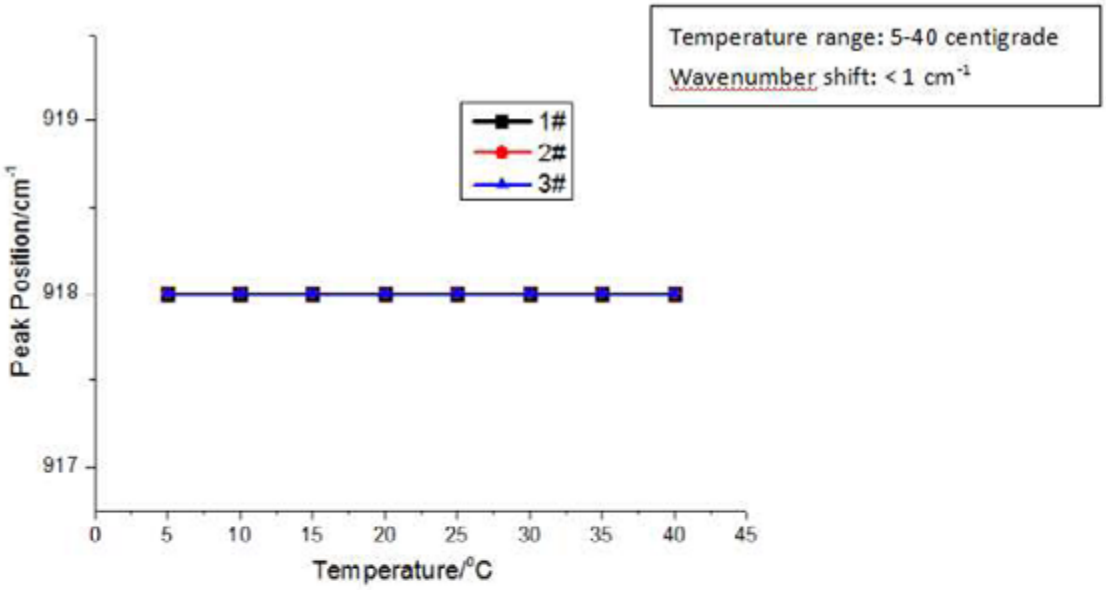


Fig. 3.1 Wavenumber shift results testing from 5 °C to 40 °C of fives ATR2000 portable Raman spectrometers

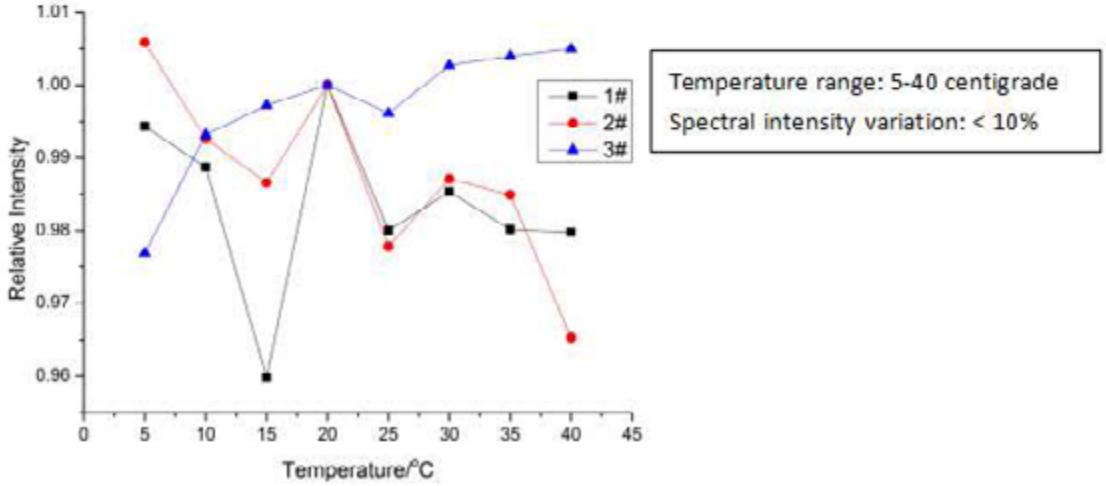
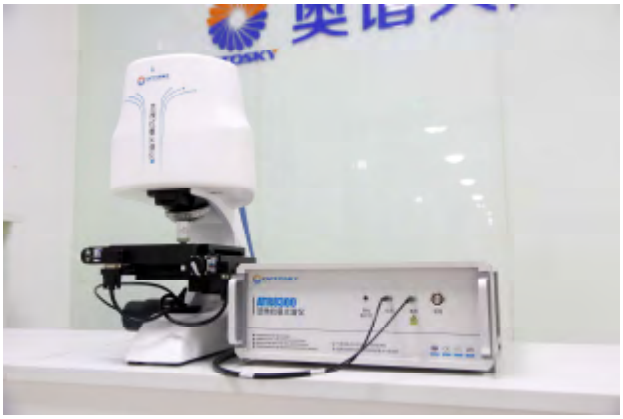


Fig. 3.2 Intensity variation testing from 5 °C to 40 °C of fives ATR2000 portable Raman spectrometers

4Order guide

PN	Wavelength /nm	Power /mW	Wavenumber range/cm^{-1}	Resolution/cm^{-1}
EOC-SI-8300MP-473	473	100	150-4000	7
EOC-SI-8300MP-532	532	100	200-4000	7
EOC-SI-8300MP-633	633	50	200-3500	4
EOC-SI-8300MP-785-27	785	600	200-2700	4
EOC-SI-8300MP-785-35			200-3500	6
EOC-SI-8300MP-785-43			200-4300	8
EOC-SI-8300MP-830	830	600	150-4000	7
EOC-SI-8300MP-1064	1064	600	200-2600	10-12
Available in custom wavelength				

5. Details



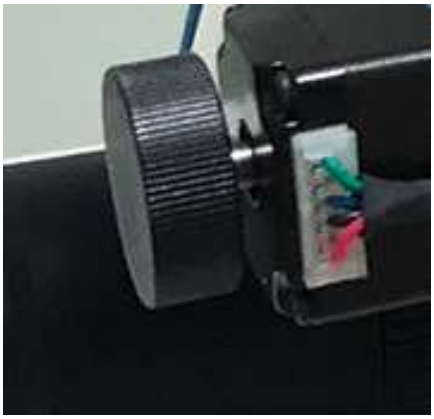


Fig 9 branded high stable microscope platform; X、Y、Z-axis precision adjustable; Adjustable knob work smooth, weight up to 5.6 Kg, very stable.

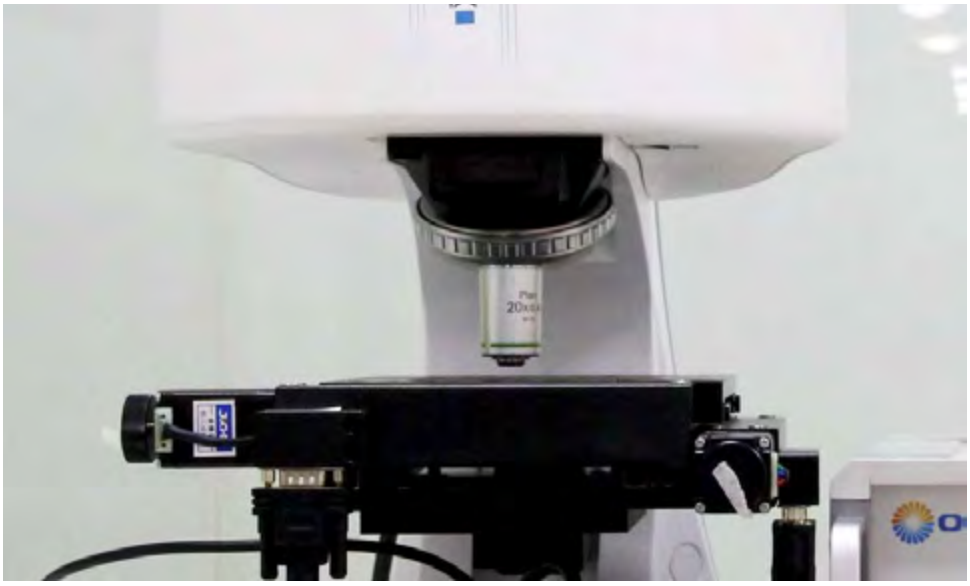


Fig 10 Raman signal high transmission objective, objective focal length up to 8mm

Fig 11 Power button, button on/off as many as1,000,000 times, high strength laser cable, signal cable is very strong, and laser indicator can intuitively display operating status.

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