

RM-3830

Raman Micro (Mapping)



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

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ATL Raman Micro combines benefits of microscope and Raman spectrometer. It becomes possible to see macro or micro areas of samples on the computer screen with just a single mouse click. When accurate positioning is visualized, the observer can detect Raman signals under various surface conditions, and synchronized Mapping can be displayed intuitively on the screen at one click operation. As a result, it provides great convenience to detect micro or macro 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 spectra.

RMM-3830 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 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.

RMM-3830 works very stable with no moving components of optical path switch, hence it avoids loss off optical path while imaging formed, and it gains optimized signal for separating imaging formed from Raman signal collection.

►► **Features:**

- Full-automated Raman experiment, auto-focusing, auto-scan
- Ultra-high sensitivity, SNR>6000:1
- True confocal, accurate Raman mapping
- Ultra-high spatial resolution
- Unique software controlled to switch optical path
- Ultra-high stability
- Brand optical element, excellent performance
- Fast positioning, quick locate focal position
- High quality objective, micro spot
- 3-mega pixel camera, crisp clear images
- Excitation wavelength(Optional): 532, 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 safety
- Waste water analysis
- Gemstones and inorganic minerals identification
- Environmental science

RMM-3830 Raman Micro Mapping	
Excitation wavelength	785 nm (532,830,1064 nm options)
Spectral resolution	4 cm ⁻¹
Spectral range	250-2700, 200-3800 cm ⁻¹ (customer wavelengths available, 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	>5000:1
Detector	TE cooled, semiconductor laser, 2048*64 pixel, back-thinned, IR enhanced CCD
wavelength range detected	200nm-1100nm
Pixel size	4 μm * 14 μm
Dynamic range	13000:1
Laser center wavelength	785nm (+/-0.5nm)
Microscope camera	3-megapixel /5-megapixel camera
focusing	Conjugate focusing(True confocal)
Laser output	>550mW (software adjustable)
laser spot diameter	>1 μm
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 μm
positioning accuracy	1 μm
canning speed	
Z axis (automated focusing)	
focusing accuracy	0.2 μm
ocusing speed	≤ 10 s



Fig. 1 RMM-3830 Structure indication diagram

►► 2. Optical performance

►► 2.1 Spectral exhibition

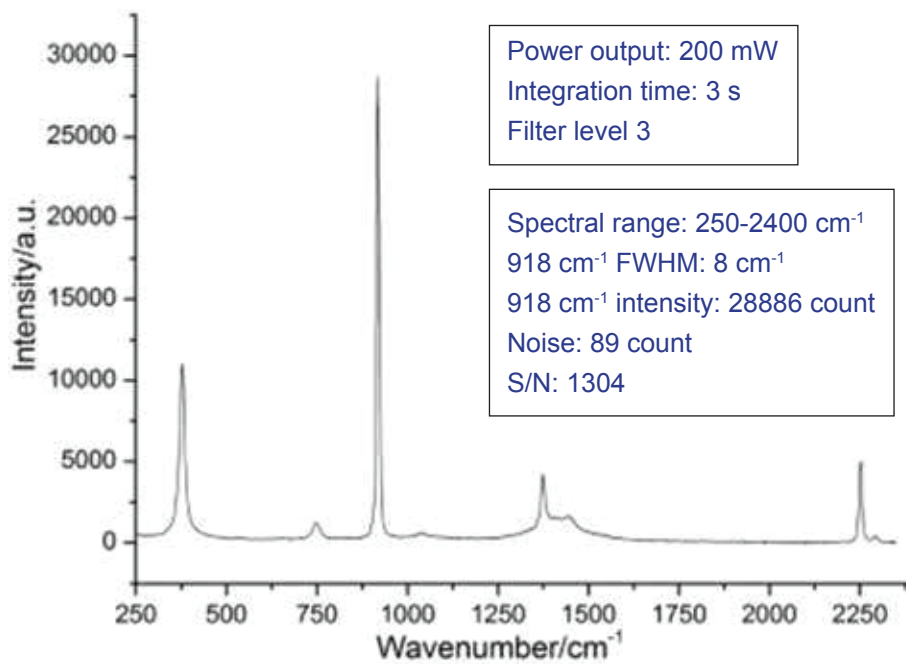


Fig. 2 RMM-3830 collect acetonitrile spectra

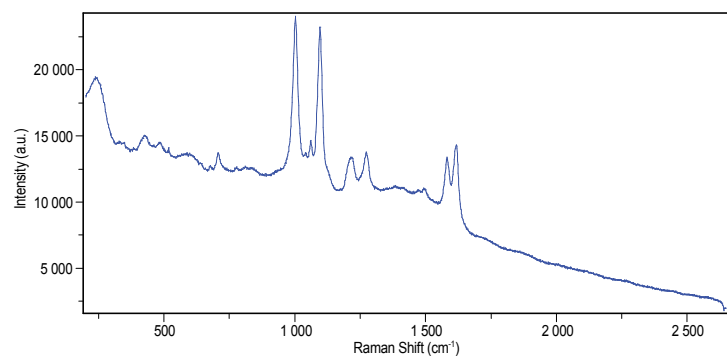
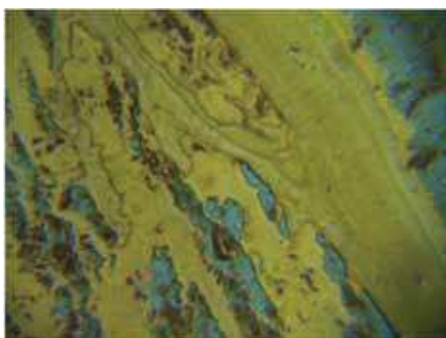
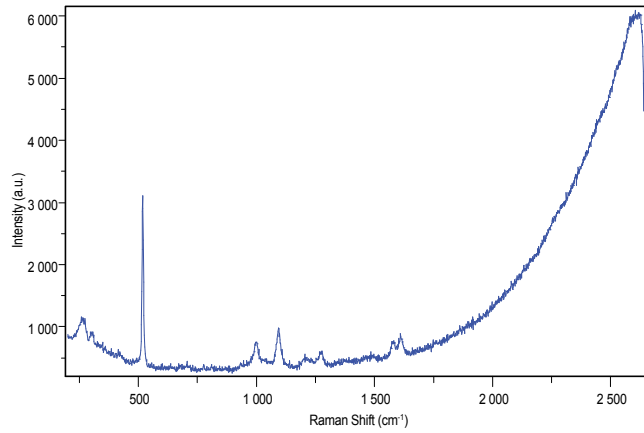
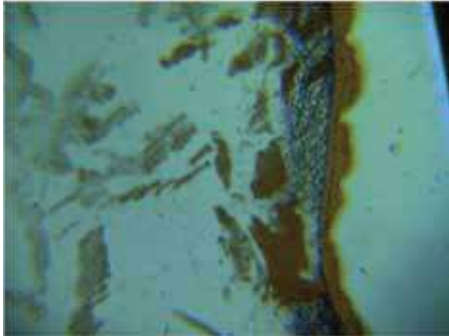


Fig.2 RMM-3830 Sers experiment 1 (Left picture is sample, and right picture is Sers Raman spectra)



RMM-3830 Sers experiment 2 (left picture is sample, right picture is Sers Raman spectra)

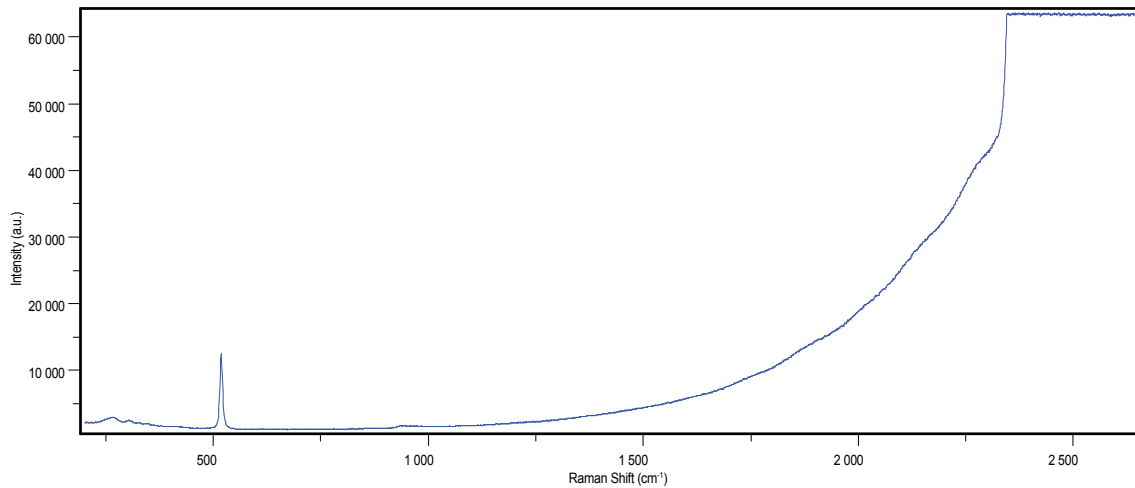


Fig 3 RMM-3830 Measure Si Raman spectra (500mW, integration time: 1S)

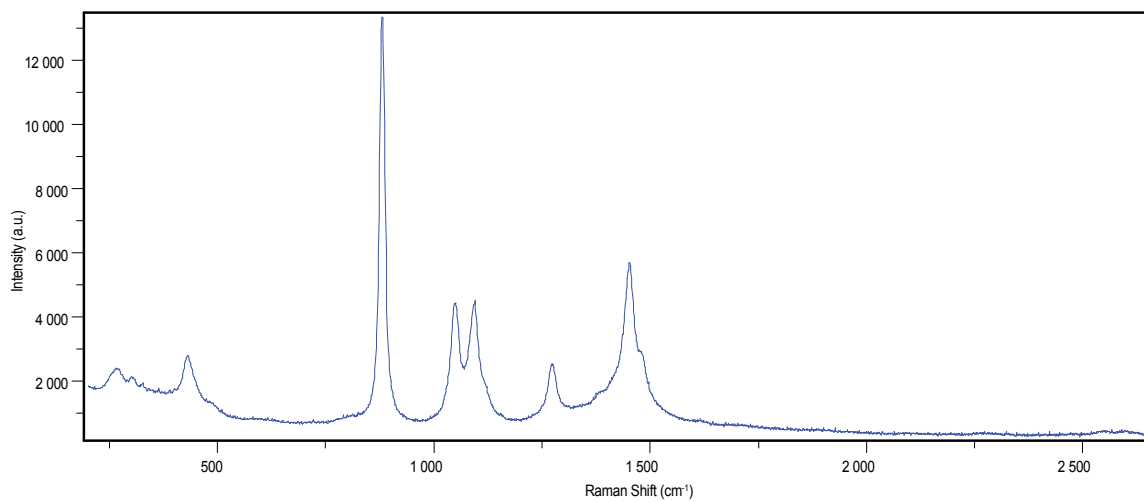


Fig 4 RMM-3830 measure alcohol spectra (500mW, integration time:1S)

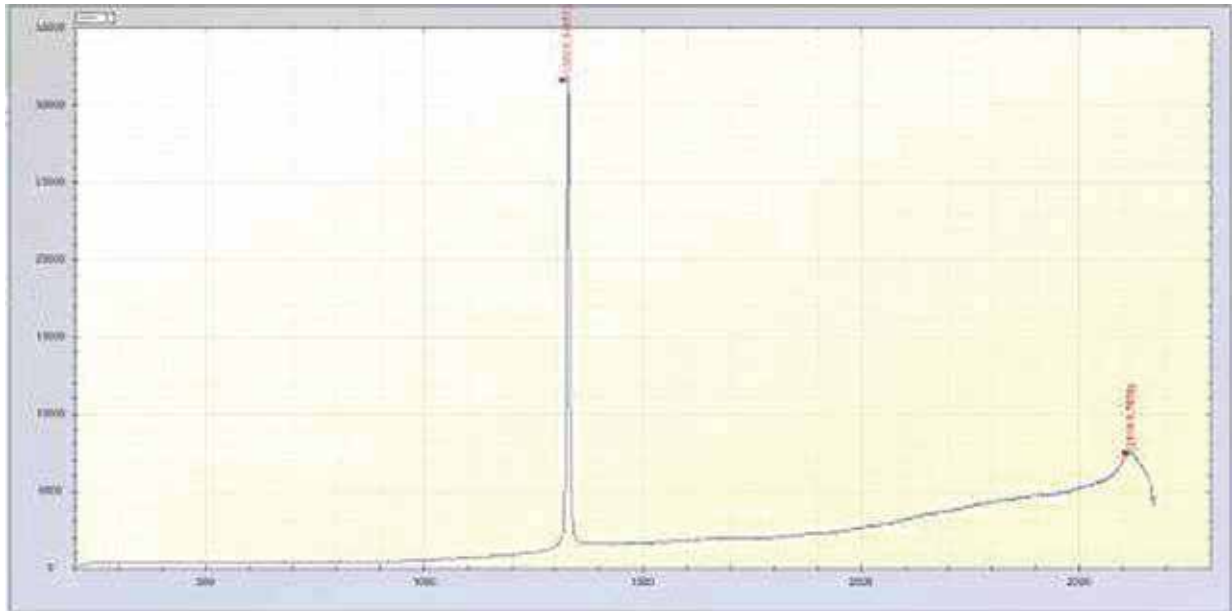


Fig 5 RMM-3830 measure diamond Raman spectra (30mW, integration time: 1S)

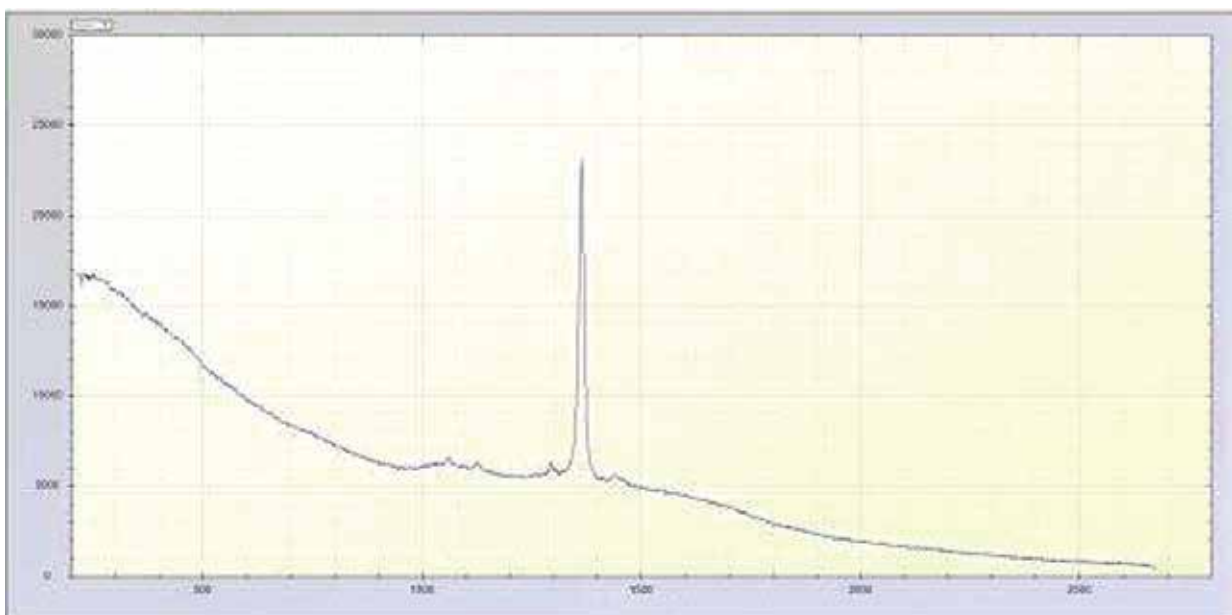


Fig 6 RMM-3830 measure boron carbide (PN) spectra (200mW, integration time: 2S)

►► 2.2 Raman resolution

►► 2.2.1 Tylenol 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.

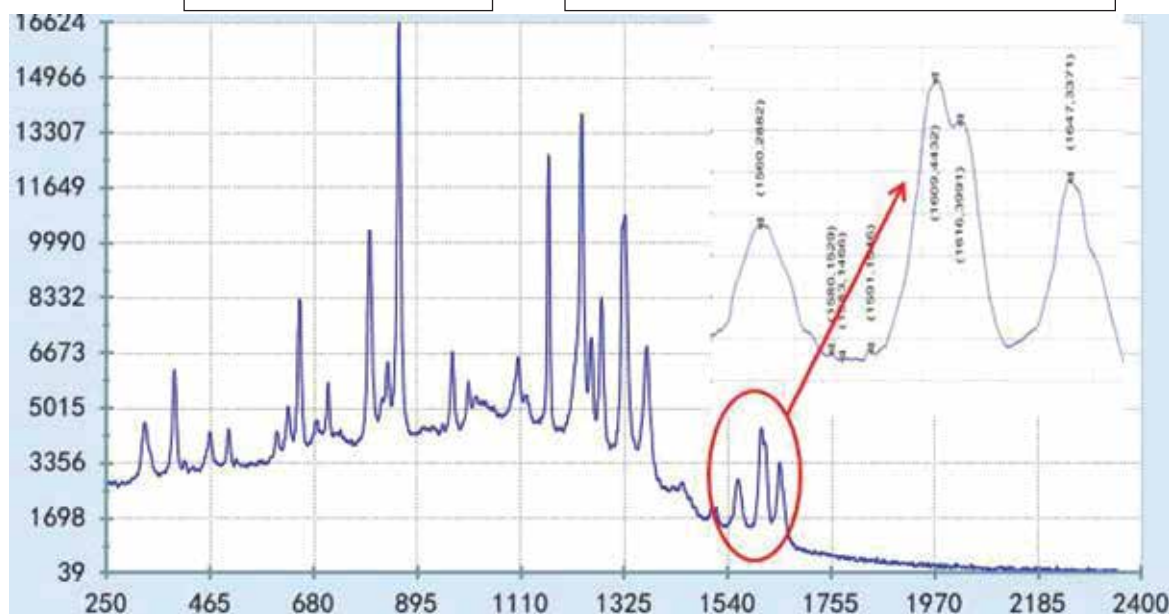


Fig 7 Tylenol spectra shows clear 1610/1615 cm^{-1} vibration peak

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

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

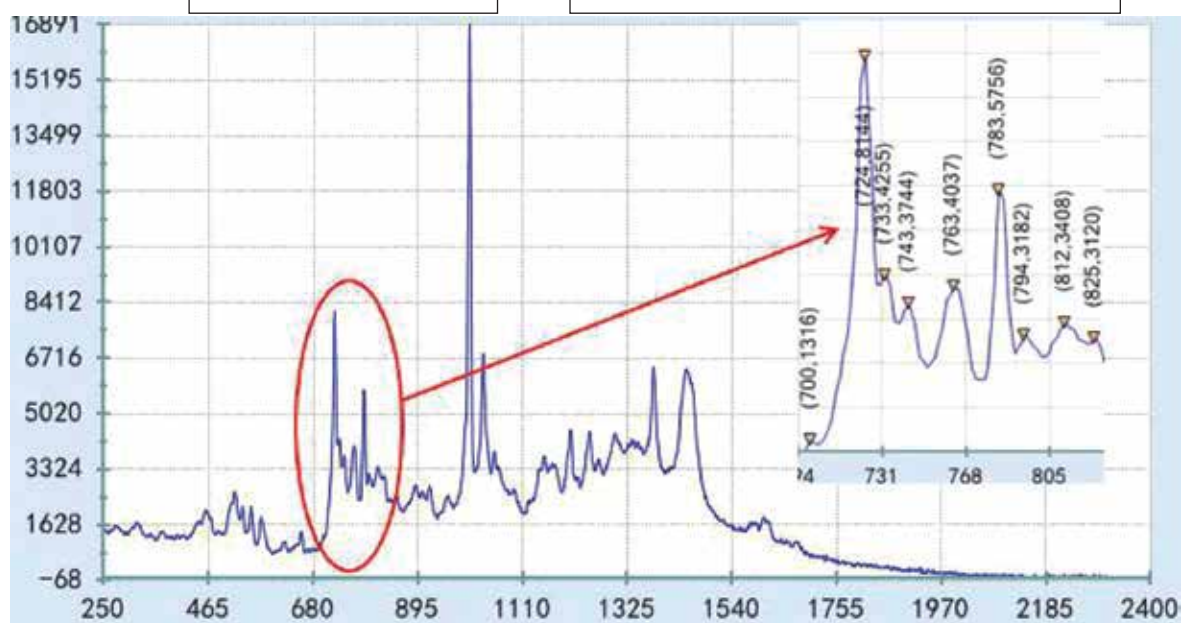


Fig 8 93# petrol Raman spectra, 723/732/742 cm^{-1} spectral shift is clearly recognized

►► 3Reliability

Fig3.1, Fig3.2 temperature stability is measured by RMM-3830, 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)

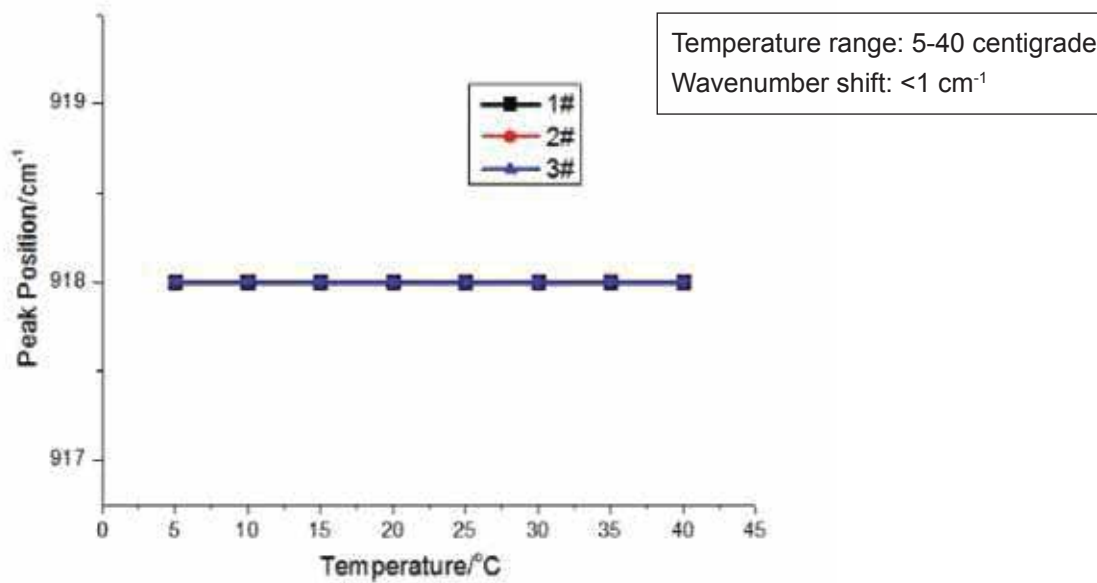


Fig. 3.1 Wavenumber shift results testing from 5°C to 40°C of fives RMM3200 portable Raman spectrometers

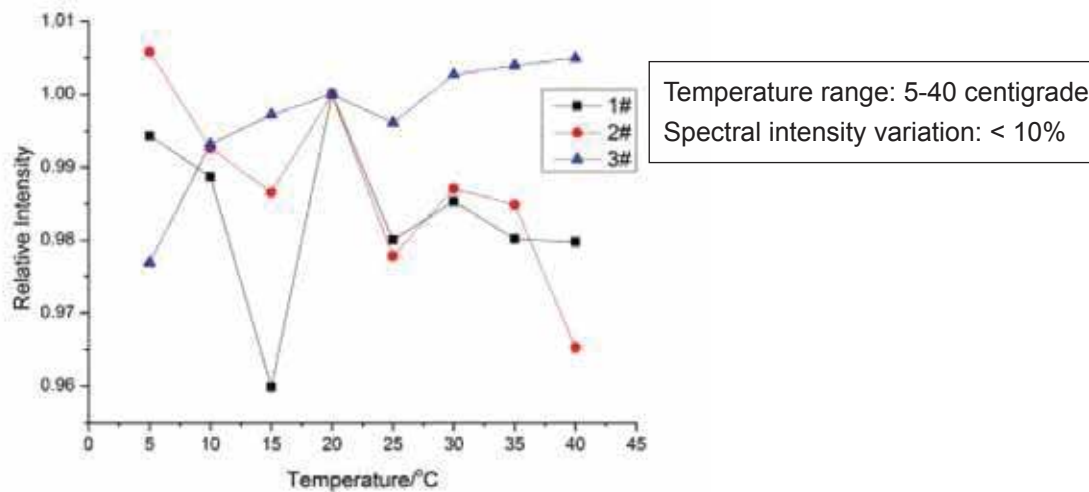


Fig. 3.2 Intensity Variation testing from 5°C to 40°C of fives RMM3200 portable Raman spectrometers

►► Order guide

PN	Wavelength /nm	Power /mW	Wavenumber range/cm ⁻¹	Resolution/cm ⁻¹
RMM-3830-473	473	100	150-4000	7
RMM-3830-532	532	100	150-4000	7
RMM-3830-785-27	785	600	250-2700	5
RMM-3830-785-40			150-4000	6
RMM-3830-830	830	600	150-4000	7
RMM-3830-1064	1064	600	150-4000	10
Available in custom wavelength				

►► 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, confocal distance length up to 8nm



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 Micro: power socket +USB2.0 connector

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Spectrophotometer



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