

高灵敏度、高分辨率
1064nm 科学级便携式制冷拉曼光谱仪

ATR3100-1064

特征

- 透过不透明塑料桶直接检测；
- 高稳定性 1064nm 半导体激光器；
- 超低荧光背景；
- 超高灵敏度的线性 InGaAs 探测器
- 二级 TEC 制冷；
- 超低噪声电路；
- 强大的嵌入式软件；
- 峰值搜索和显示；
- USB 2.0；
- 触摸操作；
- 友好的人机界面；
- 支持 LAN 远程控制；

应用领域

- 生物科学
- 制药工程
- 法医分析
- 农业与食品安全
- 宝石鉴定

综合描述

ATR3100-1064型便携式拉曼光谱仪，采用超窄线宽的制冷型半导体激光器，二级制冷的超高灵敏度 InGaAs线阵CCD，使其具备超高性能、超高灵敏度，特别适合科研、医疗器械等领域。显著的可靠性使检测结果准确可靠。优良的低杂散光条件使光谱仪具有广泛的应用，特别是在公共安全、食品安全、制药工程、珠宝检测、结石成分分析等。该多功能软件促进了应用中的光谱分析过程。

ATR3100-1064可以直接透过厚达3mm的不透明塑料桶，直接检测内部样品的成分，保证了工作人员安全，也使得操作过程更为简便。



1 Specifications

ATR3100-1064 系统	
接口	USB 2.0
操作系统	电脑操作
电池供电时间	内部无电池
积分时间	4ms - 120s
电源电压	DC 19V(+/-5%)
工作温度	-25~50 °C
工作湿度	< 95%
尺寸 (L*W*H)	30×22.5×13.2 cm ³
重量	3.5 Kg
可靠性	
光谱稳定性	$\sigma/\mu < 0.5\%$ (COT 8 hours)
温度稳定性	谱移 $\leq 1 \text{ cm}^{-1}$ (10-40 °C)
光谱强度变化 (in 5 ~ 40 °C)	$\leq \pm 5\%$
光学参数	
光谱范围	250-2400 cm^{-1}
光学分辨率	10 cm^{-1} @1450nm
信噪比	>8000:1 ★
入射狭缝	50 μm
光学系统	f/4 C-T 交叉对称光路
焦距	98 mm for incidence and output
探测器	
型号	超高灵敏、快速制冷、线性 InGaAs CCD
光谱范围	900-1700 nm
有效像素	512 像素
动态范围	15000: 1
像元尺寸	500 μm ×50 μm
满阱容量	187 Me^-
灵敏度	16 nV/e-
激发光	
中心波长	1064 nm ($\pm 0.5\text{nm}$)
半峰宽	0.1 nm
输出功率	$\geq 500 \text{ mW}$
功率稳定性	$\sigma/\mu \leq \pm 0.2\%$
拉曼探针	

工作距离	6 mm
阻透率	OD>8
数值孔径	0.3
孔径	7mm

2 Optical Performance

2.1 General spectral performance

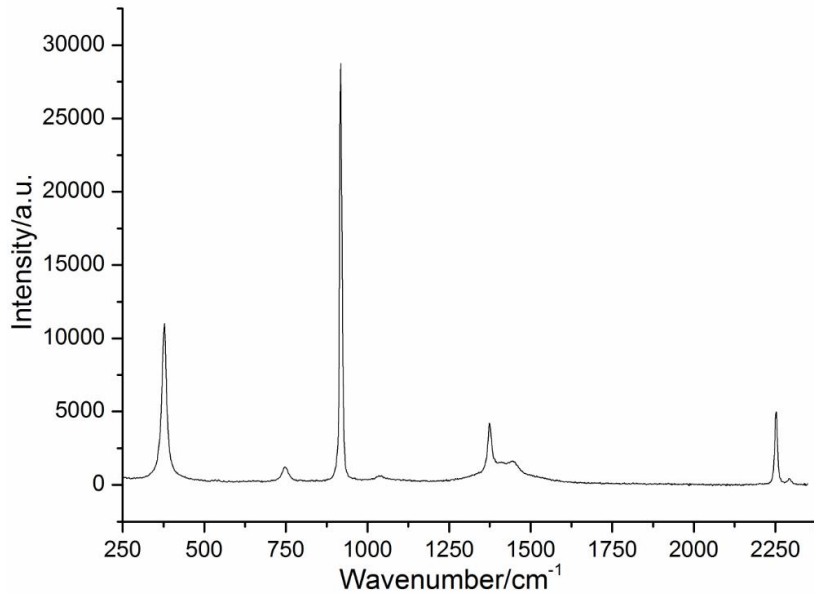


Figure 1 Raman spectra of acetonitrile

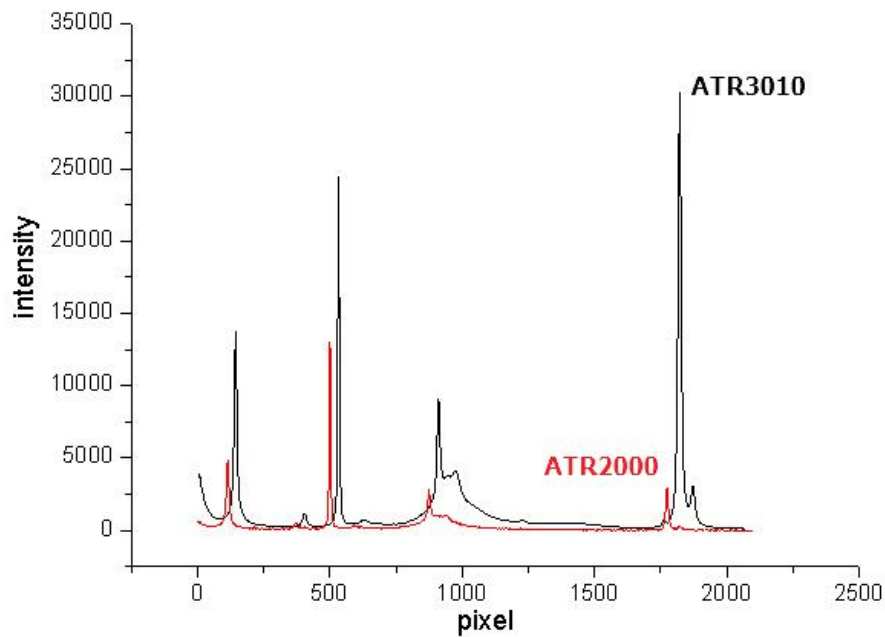


Figure 2 Sensitive of ATR3100 vs ATR2100

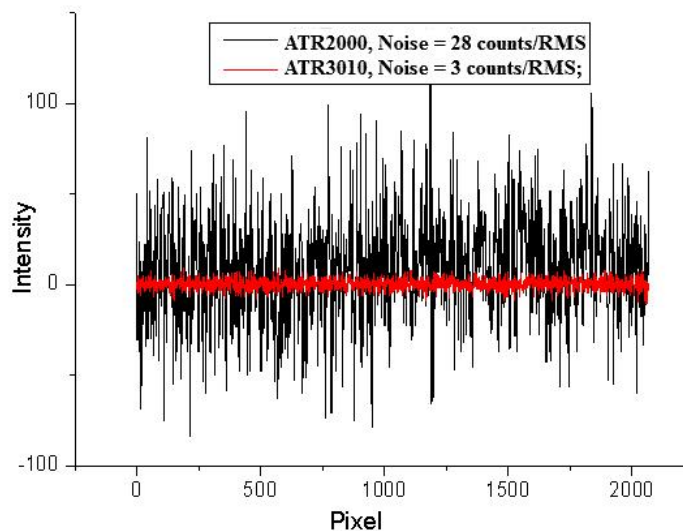


Figure 3 Noise of ATR3100 vs ATR2100

2.2 Spectral Resolution

2.2.1 Raman spectral of Tylenol

Excited laser intensity: 200 mW
Integrate time: 10 s
Boxes car: 1 time

Raman spectra of Tylenol showed the resolution condition in the long wavelength region. That is better than 6 cm^{-1} .

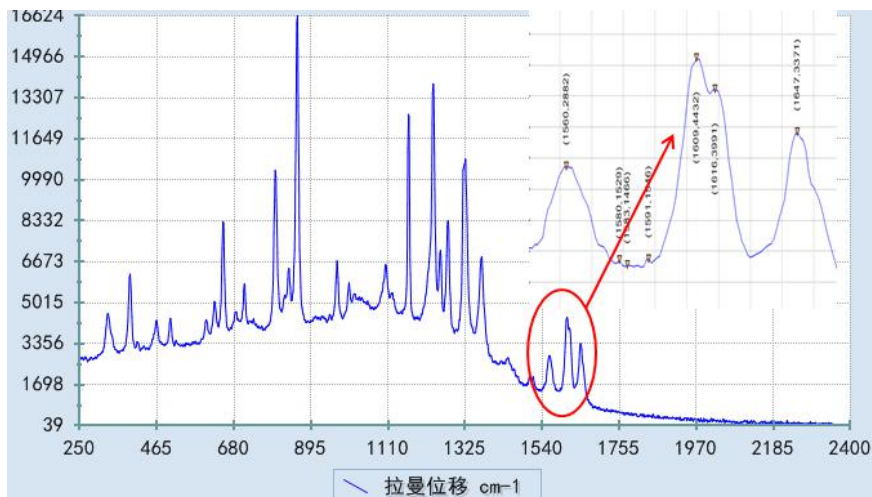


Fig.2.2 Raman spectrum of Tylenol, the vibration mode 1610/1615 cm^{-1} can be resolved.

2.2.2 Raman spectral of petrol

Excited laser intensity: 200 mW
Integrate time: 10 s
Boxes car: 1 time

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

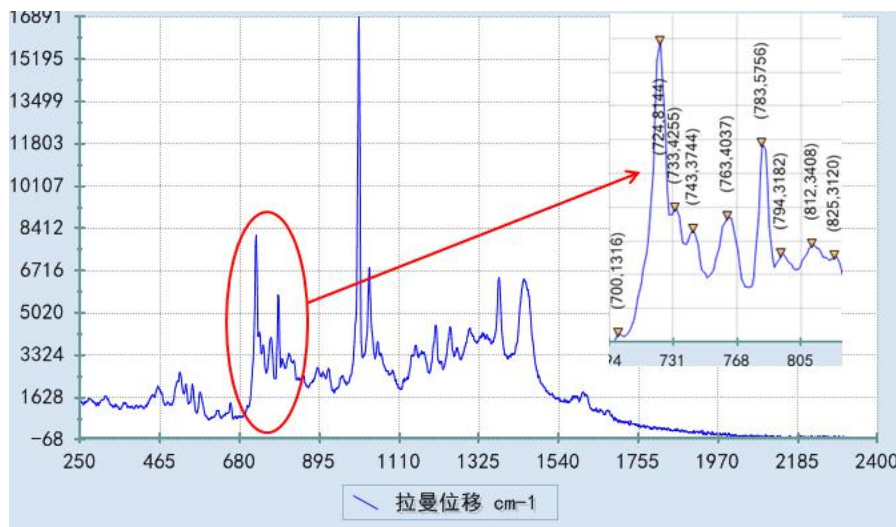


Fig.2.3 Raman spectrum of petrol 93#, the vibration mode 723/732/742 cm^{-1} can be resolved.

3 Reliability

Figure 3.1 and Figure 3.2 showed the temperature reliability testing results of five ATR3010 portable Raman spectrometers. The testing temperature range was from 5 °C to 40 °C. The spectrometer was kept more than 1 hour at every temperature spots. Acetonitrile was used as the standard sample in the testing. The testing results were calculated using 918 cm^{-1} of acetonitrile. The

wavenumber shift was 1 cm^{-1} or less(as show in Fig. 3.1). The peak intensity variation was less than 10% (as show in Fig. 4).

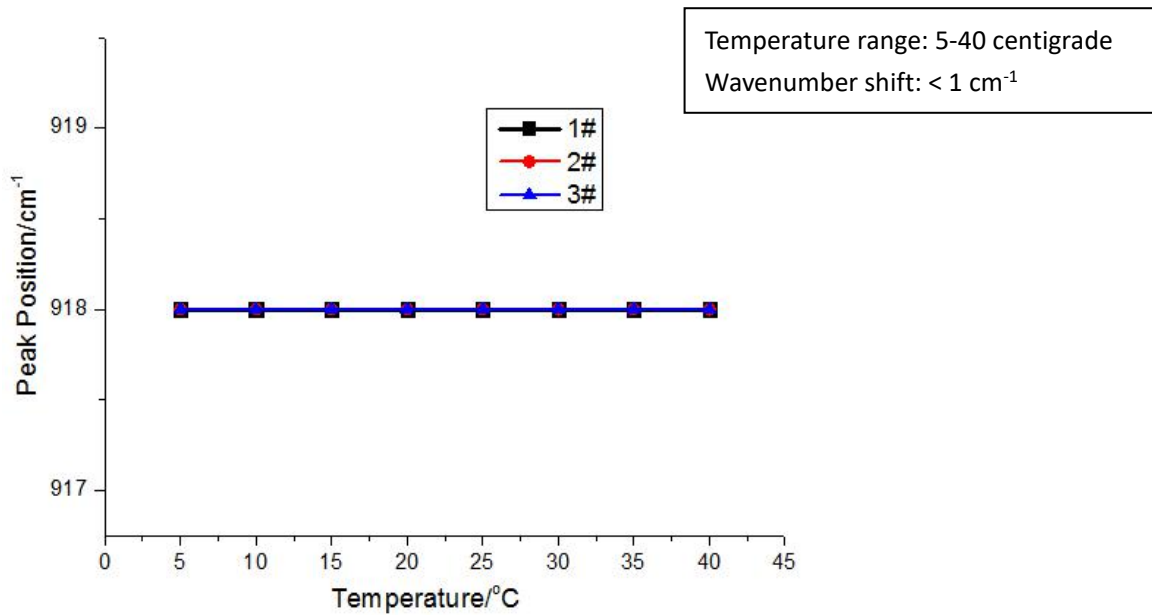


Fig. 3.1 Wavenumber shift results testing from 5 °C to 40 °C of fives ATR3010 portable Raman spectrometers

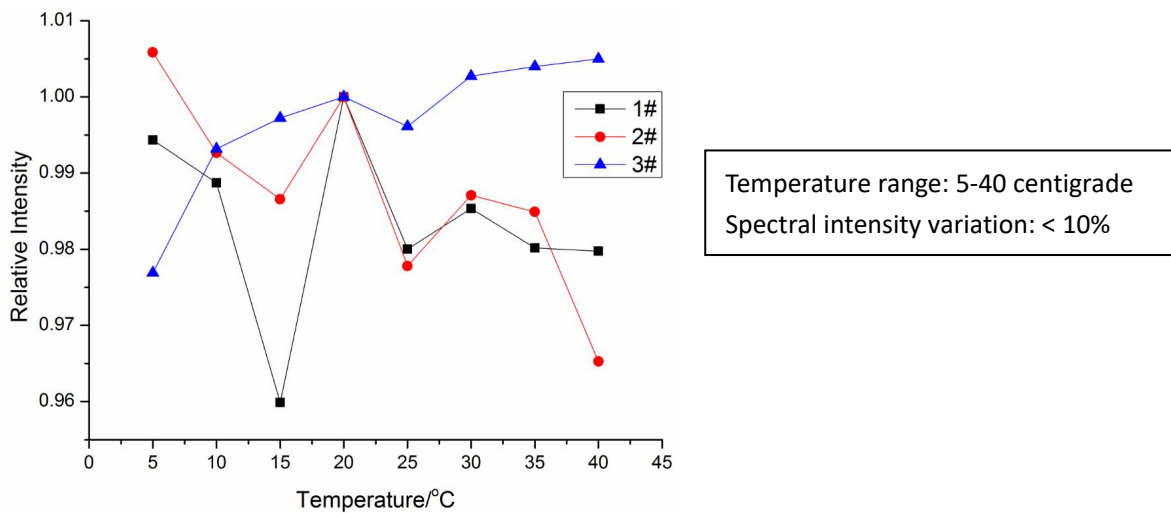


Figure 4 Intensity variation testing from 5 °C to 40 °C of three ATR3010 portable Raman spectrometers

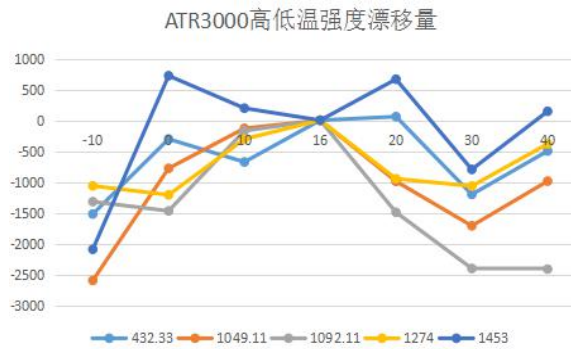


Figure 5 Intensity variation -10 °C to 40 °C of ATR3100 portable Raman spectrometers, sample is alcohol.

4 订购信息

型号	波长/nm	功率 /mW	波数范围/cm ⁻¹	分辨率/cm ⁻¹
ATR3100-473	473	100	150-4000	7
ATR3100-532	532	100	150-4000	7
ATR3100-785-27	785	600	250-2700	5
ATR3100-785-40			150-4000	6
ATR3100-830	830	600	150-4000	7
ATR3100-1064	1064	600	150-4000	10
其他波长可定制				