DATASHEET
EOC-SI-R1200
Teaching Raman Spectrometer

Raman Teaching

Raman spectra provides fingerprint about materials, and it's an excellent qualitative analytical method. Raman spectrometer has gradually become leading role in the field of analytical and measuring instruments in development of technology and application. Raman spectrometer is an analytical tool that does not require sample per-treatment or direct contact with the sample in either solid, liquid or gas state. It's mainly used for analyzing molecular composition, substance structure and relative content in either solid, liquid or gas state, substance identification, qualitative analysis and some quantitative analysis of liquid formulations. Therefore, Raman spectra knowledge is a basic skill mastered by students majoring in chemistry, materials, biology and information etc.

Regarding university teaching and education, Optosky provides a complete system of Raman teaching experiment by collaborative practice with multiple universities such as Xiamen University, Xiamen University of Technology and Shanghai University etc.

ATR1200 Teaching Raman employs narrow linewidth laser, Raman probe, TE cooled spectrometer, and multiple samples and reagents used for experiment, experiment outline. It provides great convenience to teacher passing on Raman knowledge.

Optical path

Course Description

**Experimental Objective:**
1) Know Raman spectra, and master basic principle and structure of Raman spectrometer.
2) Know scope of application, general application of Raman spectrometer
3) Master how to operate Raman spectrometer.
4) Learn how to use Raman spectrometer to read spectra of substance.
5) Know Raman microscope, and master substance composition detected
6) Identify unknown matters and determine their concentration by Raman spectrometer

Experimental contents:
1) Raman laser inspection
2) Raman probe principle and usage
3) Raman system detection buildup
4) Raman spectrometer of CCl_4 measurement
5) Identify chemical samples by Raman spectrometer (to measure a spectra of ethanol, methanol, industrial alcohol and white spirit etc)
6) Raman spectra measurement of standard plastic specimen
7) Identify standard specimen by comparison of its spectra with data library by best matches
8) Quantitative analysis concentration of inorganic salt solution
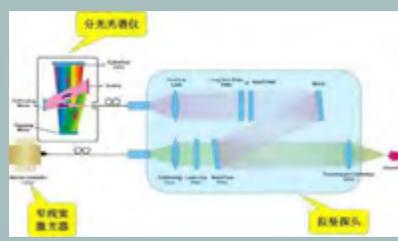
Raman Measurement System

（PC EXCLUED）

ATR1200 System	
Integration time	4ms - 120s
Power voltage	DC 5V(+/-5%)
Operating Temperature	-15-50℃
Operating humidity	< 95%
Dimension(L*W*H)	30×22.5×13.2 cm^3
Weight (t)	7 Kg
Reliability	
Spectral reliability	σ/μ < 0.5%　(COT 8 hours)
Temp reliability	Spectral shift ≤ 1 cm^{-1} (10-40 ℃)
Spectral intensity change（in 5～40 ℃）	<±5%
Optical parameters	
Spectral range	250-2800 cm^{-1}
Resolution	6 cm^{-1}
SNR	>1000:1
Entrance slit	50 μm
Optical system	f/4　Crossed C-T
Confocal distance	98 mm for incidence and output
Detector	
Item	Linear Array Detector
Detecting range	200-1100 nm
Effective pixels	2048
Dynamic range	3000：1
Pixel size	14μm×200μm
Full well capacity	100 Ke$^-$
Sensitivity	130 Photon @ 400 nm; 60 Photon @ 600 nm
Excitation laser	
Central wavelength	785nm (+/-0.5nm)
FWHM	0.08 nm
Power output	≥ 550 mW
Power reliability	σ/μ <±0.15%
Raman probe	
Operating distance	6 mm
Rayleigh scattering resistance	OD>8
Numerical aperture	0.3
Aperture	7mm