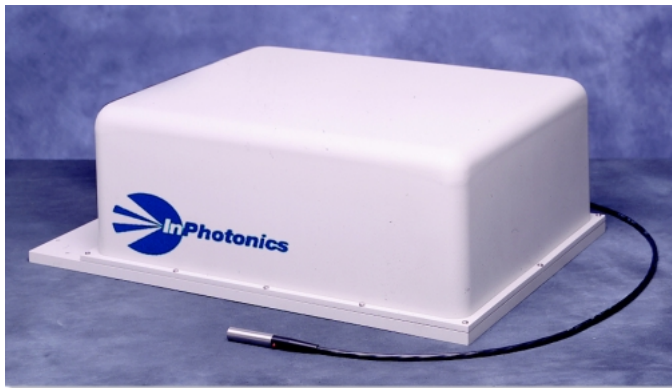




RS2000

High Resolution Raman Spectrometer

The RS2000 Raman spectrometer is a full range, high-resolution system for research and analytical applications requiring only the very best data. Fiber-coupled sampling provides flexible measurement possibilities and high optical throughput from the sample, through the spectrograph, to the cooled detector.



The RS2000 Spectrometer and RamanProbe

Permanent Calibration and High Throughput

The RS2000 is the first Raman spectrometer to offer both high resolution and full spectral range capabilities in a system without moving parts or throughput-limiting slits. Unique to the system is an echelle spectrograph that offers light dispersion in two dimensions to fully exploit the CCD detector area. The result is better than 1 cm^{-1} spectral resolution from $200 - 3500 \text{ cm}^{-1}$ (Raman shift). No other spectrometer can provide this range and resolution without switching grating positions. The lens based optics are matched to a fiber optic input, providing 1:1 imaging at the focal plane and negating the need for an entrance slit.

The spectrograph is compact (26" x 16" x 8"); it is an ideal system to mount on a cart for at-line measurements wherever they are required. Spectra are automatically software corrected with a factory-measured reference to generate "standard" spectra. This is important for the creation of and comparison with digital databases. Frequency calibration is permanent for reproducible quantitative analyses.

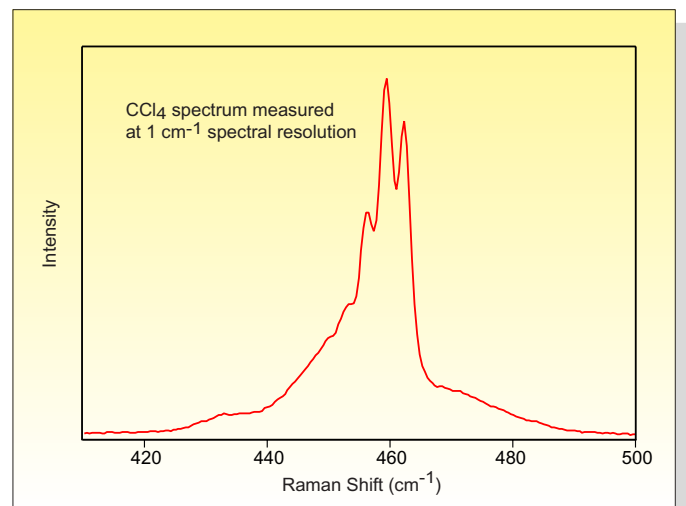
NIR or Visible Excitation

The RS2000 is optimized for operation at a specific excitation wavelength. For maximum fluorescence suppression, the RS2000 NIR comes equipped with a 785 nm diode laser. A new option is a 670 nm version resulting in extended range coverage to the OH stretching region (3600 cm^{-1}). The RS2000 VIS is equipped with a 532 nm laser, and can also be used with a 514 nm laser source.

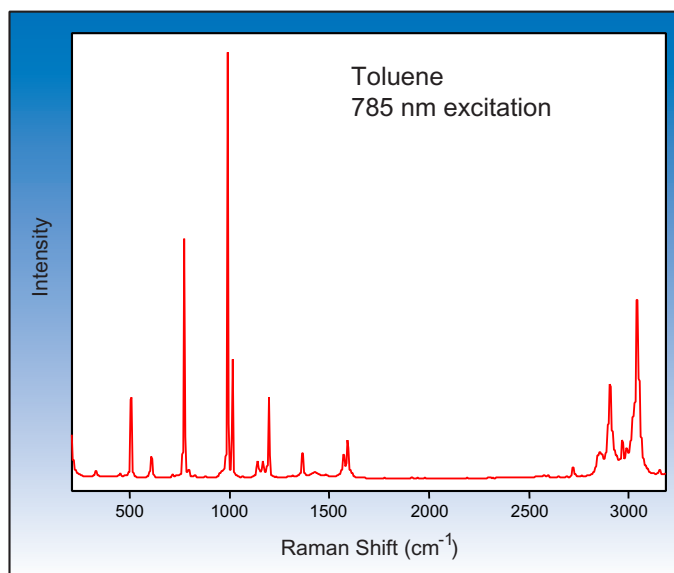
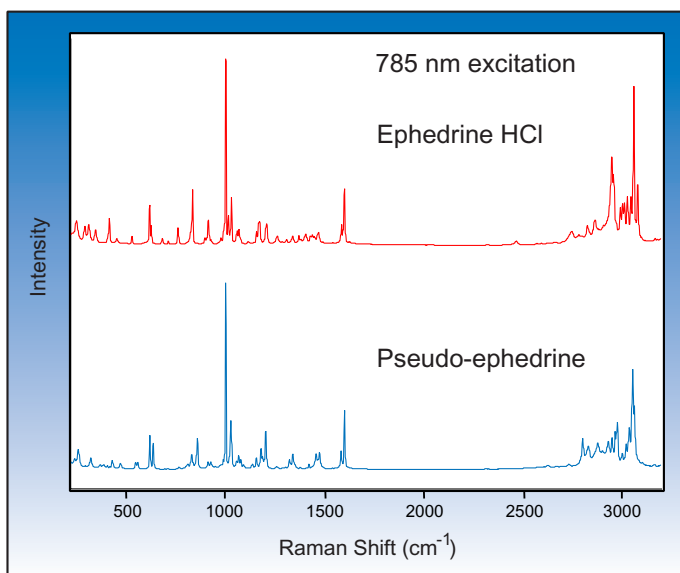
Flexible Sampling with the RamanProbe™

One of the many advantages of Raman spectroscopy is that measurements can be made directly through glass containers. To accommodate any size sample, the RS2000 systems are configured with InPhotonics' innovative RamanProbe™ for versatile fiber optic sampling.

The standard probe is designed for through-packaging analysis up to 5 m away from the spectrometer. Other configurations are available with different working distances, cable lengths, and chemical resistance properties. InPhotonics also offers sample holders of various sizes for Class I spectrometer operation.



High-Resolution Spectra



Features and Specifications

| | RS2000 (visible) | RS2000 (near-IR) |
|---------------------------------|---|--|
| Optical Design | Echelle spectrograph with aluminum-coated grating and visible prism for cross dispersion in fixed configuration, employing no spectral slits. | Echelle spectrograph with gold-coated grating and near-IR prisms for cross dispersion in fixed configuration, employing no spectral slits. |
| Excitation Source | 50 mW, diode-pumped 532 nm laser (others available upon request). | 300 mW, frequency-stabilized 785 nm diode laser (670 nm option also available). |
| Spectral Range | 200 - 3950 cm^{-1} Stokes shift. ¹ | |
| Spectral Resolution | 1 cm^{-1} (measured as FWHH of atomic emission lines) with < 0.3 cm^{-1} pixel spacing. ² | |
| Calibration Method | Fixed optics provide permanent calibration under typical operating conditions. Intensity response correction performed automatically through software. | |
| Detector | Three-stage TE-cooled, front-illuminated CCD array, 1024 x 256 pixels, operating at -55°C | |
| Sampling Accessory | RamanProbe™ with O.D. 8 at excitation wavelength, 5 m cable length, 5 mm working distance. Other configurations and Class I sample holders available. | |
| Physical Specifications | Spectrograph footprint 26" x 16" x 8" with external laser; total system weight approx. 65 lbs. | |
| PC Hardware and Software | RS2000 acquisition software requires PC running Windows XP® or Windows 2000. GRAMS AI spectral manipulation software (from Thermo Electron Instruments) also available. | |
| Power Requirements | 110V-AC. | |

¹CCD detector is limited beyond 1100 nm; spectral range at 785 nm excitation is 200 - 3200 cm^{-1} Stokes shift.

²Spectral resolution defined with 50 μm input fiber. Resolution is approximately 4 cm^{-1} with standard RamanProbe optics. Specifications are subject to change without notice.

