

## MacroRAM™ For Education

ELEMENTAL ANALYSIS  
FLUORESCENCE  
GRATINGS & OEM SPECTROMETERS  
OPTICAL COMPONENTS  
CUSTOM SOLUTIONS  
PARTICLE CHARACTERIZATION  
RAMAN / AFM-RAMAN / TERS  
SPECTROSCOPIC ELLIPSOMETRY  
SPR IMAGING

Macro RAMAN  
for Teaching Labs



The MacroRAM™ Raman spectrometer is an ideal instrument for teaching Raman spectroscopy to undergraduate students. Its compact and robust design, including Class 1 laser safety, means it is safe for use in all undergraduate laboratories.

### Simple and Safe

- Easy-to-install and use; Works right out of the box!
- Interlocked sample compartment with class 1 laser safety
- Intuitive and powerful LabSpec 6 software

### Compact and Rugged

- Small-footprint, bench-top system
- Robust optical design
- Light enough to be moved from location to location

### Versatile Design

- Measure solids, liquids, powders and more
- Thermostatted cuvette holder available for temperature-controlled measurements
- External fiber ports for probe-based measurements

### Accessories

Quartz and Fused Silica Cuvettes



Reference Polystyrene Cuvette



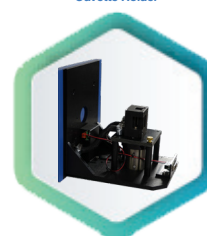
HPLC Flow Cell



Reduced Volume Cuvette and Adapter



Thermostatted Cuvette Holder



Solid Sample Holder



Cuvette Holder



Temperature Bath



SuperHead



Touch/Immersion Probes



# Educational labs/What you will learn:

To facilitate the use of the MacroRAM in the undergraduate teaching laboratory setting, a series of educational labs were created. Designed to teach some of the most important concepts in Raman spectroscopy, such as identification, quantification, and vibrational chemistry, these educational labs can be used as is, or tailored to fit the needs of any undergraduate laboratory.

## Testimonial:

"I taught a course this past winter term on Raman spectroscopy, and we were able to use the MacroRAM. The instrument is working great...I particularly like the LabSpec 6 software and the ability to do all of the analysis on the spectra. I appreciate the teaching materials."

**Prof. Dan Morris, Rose-Hulman Institute of Technology**

## Lab #1: An Introduction to Raman Spectroscopy and Using the MacroRAM and LabSpec 6 Software

### What you will learn:

- Introduction to Raman spectroscopy
- How to acquire and analyze Raman data with the LabSpec 6 software

## Lab #2: Raman Spectroscopy for Quantification of Isopropanol in Water

### What you will learn:

- How to use Raman spectroscopy as a tool for quantification

## Lab #3: Raman Spectroscopy of Some Common Solvents

### What you will learn:

- The functional groups found in some common solvents and how they relate to the Raman spectra

## Lab #4: Using Raman Spectroscopy to Identify Plastics

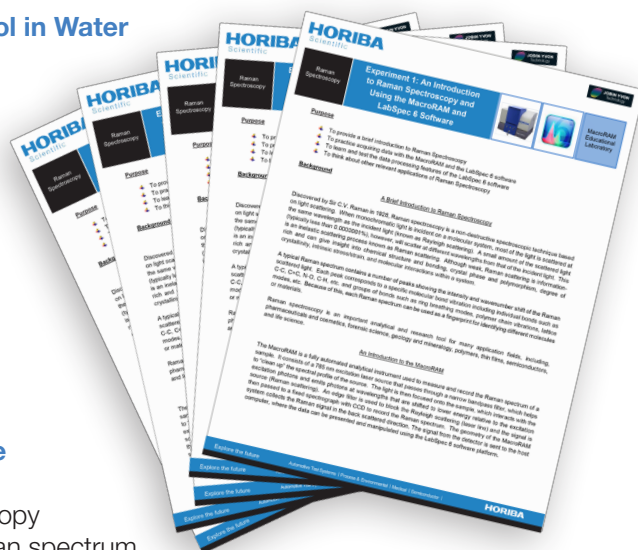
### What you will learn:

- How to correctly use a Raman database
- Limitations of Raman spectroscopy for certain materials

## Lab #5: Headspace Raman Spectroscopy of the CO<sub>2</sub> Molecule

### What you will learn:

- One simple technique for measuring gases with Raman spectroscopy
- How low vibrational modes in the CO<sub>2</sub> molecule relate to the Raman spectrum
- Rule of mutual exclusion and Fermi resonance



# Raman Academy

For further educational support, Raman Academy offers customized instruction and training designed for your needs, either online or in one of HORIBA's state-of-the-art labs.

Raman Academy gives you access to a full suite of tutorials, FAQs, video demonstrations, Tips & Tricks, on demand webinars, and more!



For more information go to:  
**[RamanAcademy.com](http://RamanAcademy.com)**

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