280-AN-0038 March 2025

Question: Can the JASCO Palmtop Raman Spectrometer Perform a Spectrum Search Using a General-Purpose Database?

Answer

Yes. The JASCO PR-1w Palmtop Raman spectrometer is equipped with real-time data processing capabilities that correct spectra during measurement, allowing highly accurate searches for measured spectra using a general-purpose database.

PR-1w Palmtop Raman spectrometer

The following points should be noted when using a general-purpose database:

1. Fluorescence Effect

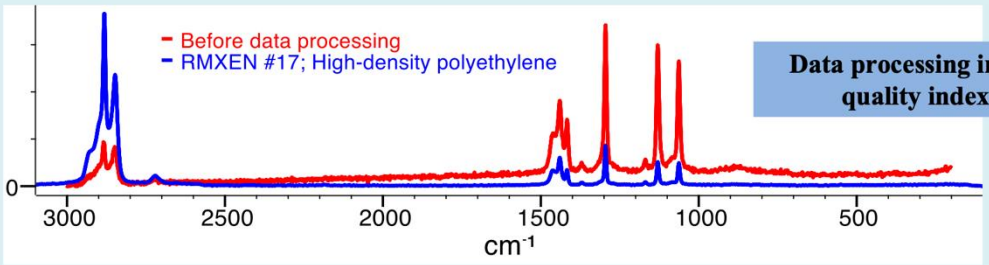
For fluorescent samples, the search score will decrease if the baseline is increased due to fluorescence.

2. Sensitivity Characteristics

In Raman spectroscopy, the sensitivity of the detector affects the measured spectrum. Generally, when a sample is excited at 785 nm, the intensity of high-wavenumber bands, such as those attributed to stretching vibrations of C-H groups in organic compounds, decreases. Therefore, if the excitation wavelengths for the spectra registered in the database differ, the accuracy of the search results will be reduced.

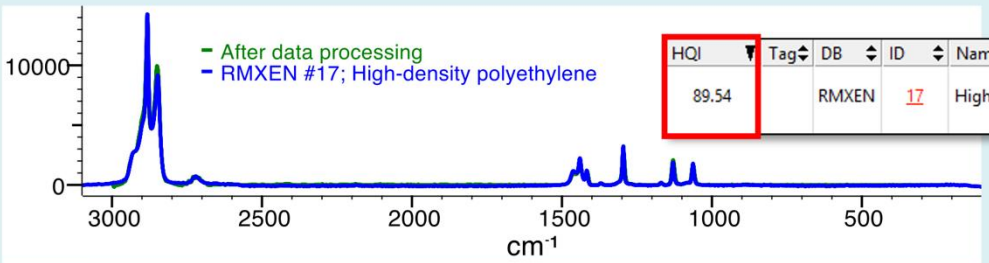
The PR-1w is equipped with a laser that produces an excitation wavelength of 785 nm and incorporates a real-time data processing function to mitigate the effect of fluorescence and sensitivity reduction. The results of database searches for a spectrum measured with the PR-1w before and after data processing are shown in the figure below. It was discovered that the data processing function allowed a highly accurate database search using a general-purpose database.

Sample : Polyethylene film
Excitation Laser : 785 nm (50 mW)
Exposure time : 1 sec
Accumulations : 4
Search program : KnowItAll



HQI	Tag	DB	ID	Name
17.40		RMXEN	17	High-density polyethylene

Data processing increases hit quality index (HQI)



HQI	Tag	DB	ID	Name
89.54		RMXEN	17	High-density polyethylene