

## Determining a Sample's Fluorescence Excitation and Emission Maxima

### Introduction

One of the challenges in performing fluorescence measurements is determining the optimum excitation and emission wavelengths for a new sample. With the vast amount of information that can be obtained using fluorescence techniques, it is critical to optimize the measurement parameters to obtain the best possible data. Jasco has developed a 3-D fluorescence measurement program that will search for the optimum peak excitation and emission wavelengths to use for unknown samples. This is accomplished by measuring the emission spectrum of a sample while changing its excitation wavelength or, conversely, by measuring the excitation spectrum as the emission wavelength is changed.



This application note shows the 3-D fluorescence spectra of p-terphenyl and tonic water using a FP-6500.

### Keywords

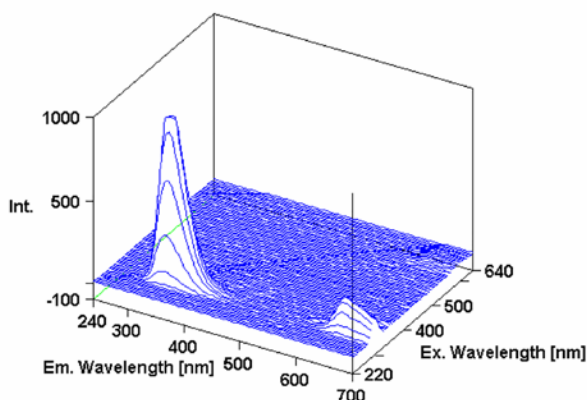
FP-6500, Fluorescence

### Experimental

Measurement Conditions			
Data Acquisition Interval	1 nm	Response Time	4 seconds
Spectral Bandwidth	1 nm	Scan Speed	20 nm/min

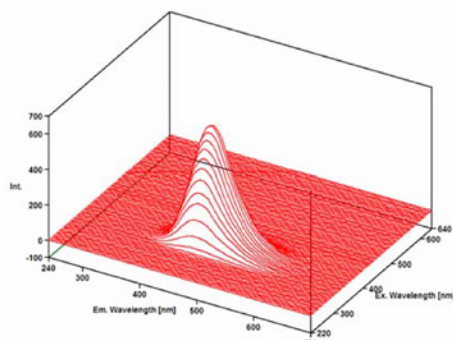
## Results

The excitation and emission spectra for p-terphenyl and tonic water were obtained using an FP-6500 spectrofluorometer and a 10 mm pathlength cell. Figure 1 illustrates the 3-D plot of the fluorescence intensity of p-terphenyl as a function of excitation and emission wavelengths. The maximum excitation wavelength occurs at 295 nm while the maximum emission wavelength is at 340 nm.



**Figure 1.** 3-D graphical representation of the excitation and emission spectra of p-Terphenyl.

Quinine is a strongly fluorescent compound that is found in tonic water. In dilute acidic solutions, there are two absorption bands centered at 250 and 350 nm, while the maximum fluorescence band occurs at 450 nm. The 3-D fluorescence spectrum of tonic water (Figure 2) was measured and then analyzed using the Interval Data Analysis program. The maximum excitation and emission wavelengths determined by the program were 360 and 455 nm, respectively.



**Figure 2.** 3-D graphical representation of the excitation and emission spectra of tonic water.

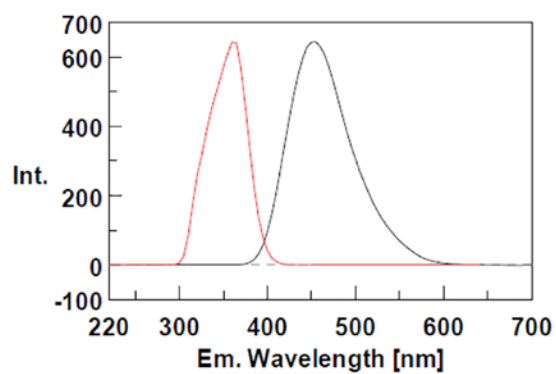


Figure 3. Emission spectrum of tonic water.

## Conclusion

This application note demonstrates how to determine a sample's excitation and emission maxima for obtaining more in-depth fluorescence measurements using the 3-D Fluorescence Measurement Program.