# Determination of Fluorescence Excitation/Emission Maxima

To determine the most favorable conditions for measurement of fluorescence spectra, Jasco incorporates a 3-D Fluorescence Measurement Program within Spectra Manager to provide a simple method for establishing the optimum parameters for further experiments.

## 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 use instrument conditions that will offer the best data. Jasco 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, measuring the excitation spectrum as the emission wavelength is changed.

## Experimental

A Jasco FP-6500 spectrofluorometer equipped with the standard 10 mm cuvette holder was used for all analyses. Standard fluorescence reference samples were obtained from Starna Cells.

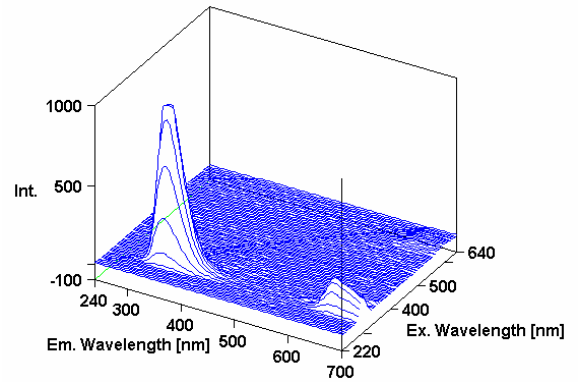


**Figure 1:** 3-D Spectrum of P-Terphenyl

In Figure 1, the 3-D spectra of p-terphenyl, which is used as a laser dye and a sunscreen component, demonstrates a maximum excitation of 295 nm and emission of approximately 340 nm.

Quinine is a strongly fluorescent compound that is found in tonic water. In dilute acid solution, there are 2 absorption bands centered at 250 nm and 350 nm and the peak fluorescence band occurs at 450 nm. After collection of the 3-D spectrum of tonic water, the 3-D fluorescence analysis program within Spectra Manager was used to perform an emission search to determine the maximum excitation and emission wavelengths. The program was able to return results similar to the known values.

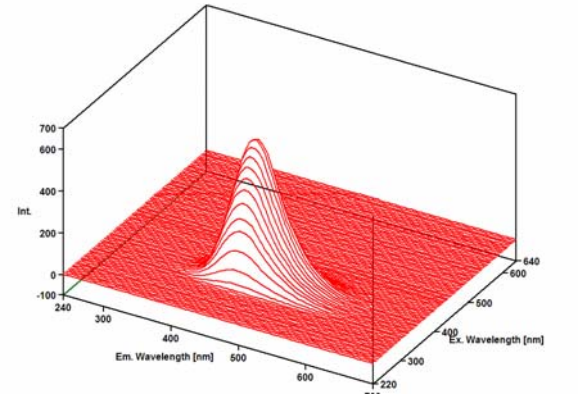


**Figure 2:** 3-D Spectrum of Tonic Water

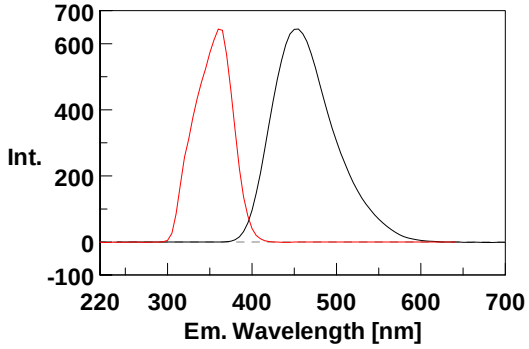


**Figure 3:** Emission Search Spectra for Tonic Water. Ex. Max: 360 nm, Em. Max: 455 nm

## Conclusions

Using the 3-D Fluorescence Measurement Program within the Spectra Manager software, it was possible to determine the optimum excitation and emission conditions for various samples.