

Liquid Chromatography

Flexar PDA Plus Detector



A Solution for Optimal Wavelength Setting

The PerkinElmer® Flexar™ liquid chromatography platform fitted with a PDA Plus™ photodiode array detector set at 275 nm, was used to analyze a solution of 0.5 mg/mL acetaminophen and aspirin. The Flexar PDA Plus detector not only captures the spectral data at the set analytical wavelength but also for the entire UV/Vis wavelength range. Results were retrieved through Chromera® spectral processing software to determine the peaks' maximum absorbance (Figure 1). With that information, the wavelengths were set for optimal response for subsequent injections.

As a result of the wavelength setting optimization, responses were improved six-fold for acetaminophen and two-fold for aspirin. Representative chromatograms of the analysis at 275 nm and the improved analysis at 245 and 231 nm are shown in Figures 1, 2 and 3. Table 1 shows the responses before and after the wavelength setting optimization.

Chromatographic conditions:

Mobile phase: 69:28:3 water/methanol/acetic acid
 Sample solvent: Mobile phase
 Flow/injection: 0.3 mL/min; 2 µL volume
 Flush solvent: 5% acetonitrile in water
 Column: Brownlee™ SPP C18, 100 x 2.1 mm, 2.7 µm at 45 °C (Cat# N9308404)
 Analytical wavelength: 275 nm
 Chromera® version 4.0. Sampling rate: 5 pts/sec

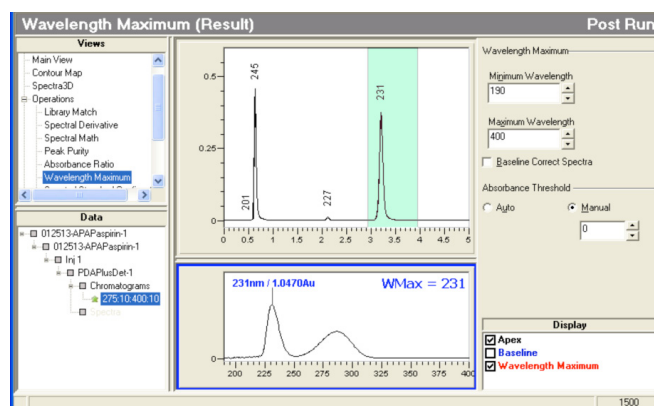


Figure 1: Chromatogram of the acetaminophen-aspirin solution showing the wavelength maximum for each peak.

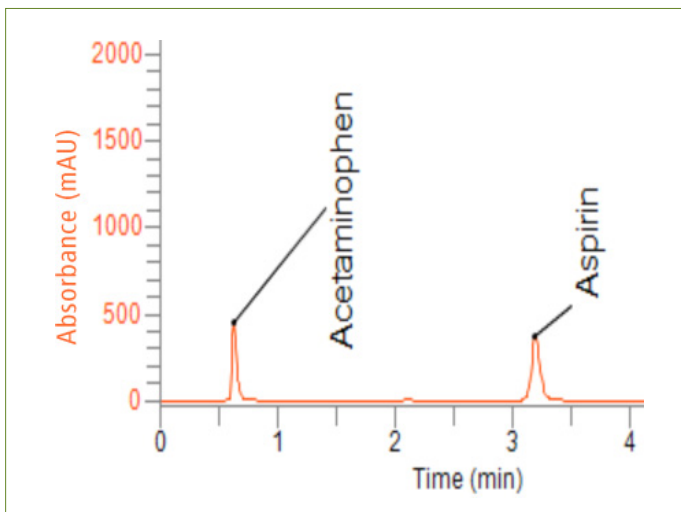


Figure 2. Chromatogram from the analysis of a standard solution at a 275 nm wavelength setting using the PDA Plus with a 10 mm flow cell.

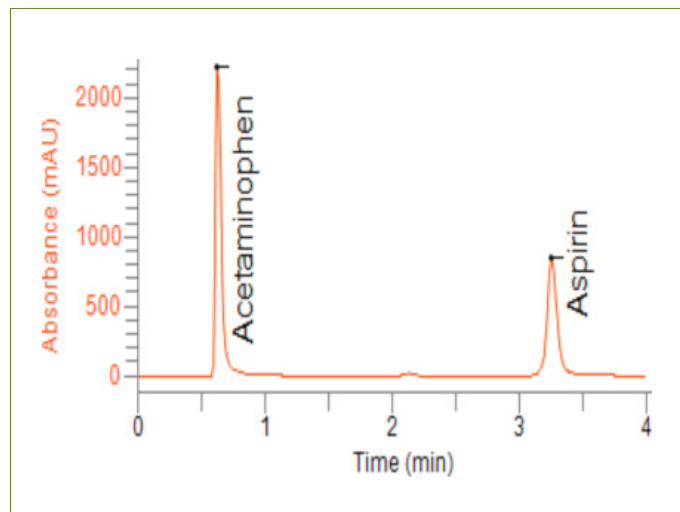


Figure 3. Chromatogram from the analysis of a standard solution at a 245 and 231 nm (2 min per steps) wavelength setting using the PDA Plus with a 10 mm flow cell.

Table 1 Analysis response

Wavelength Setting (nm)	Acetaminophen	Aspirin
275	1359	2009
241/231	7505	4808
X-times improvement	5.5	2.4

PerkinElmer's PDA Plus with Chromera or third party data processing software allows user to determine the maximum wavelength absorbance for optimal sensitivity. This serves as a very useful tool for method development as it enables an optimal wavelength setting for a given chromatographic condition. Per the analysis on this technical note this function has allowed an average four times increase in response.