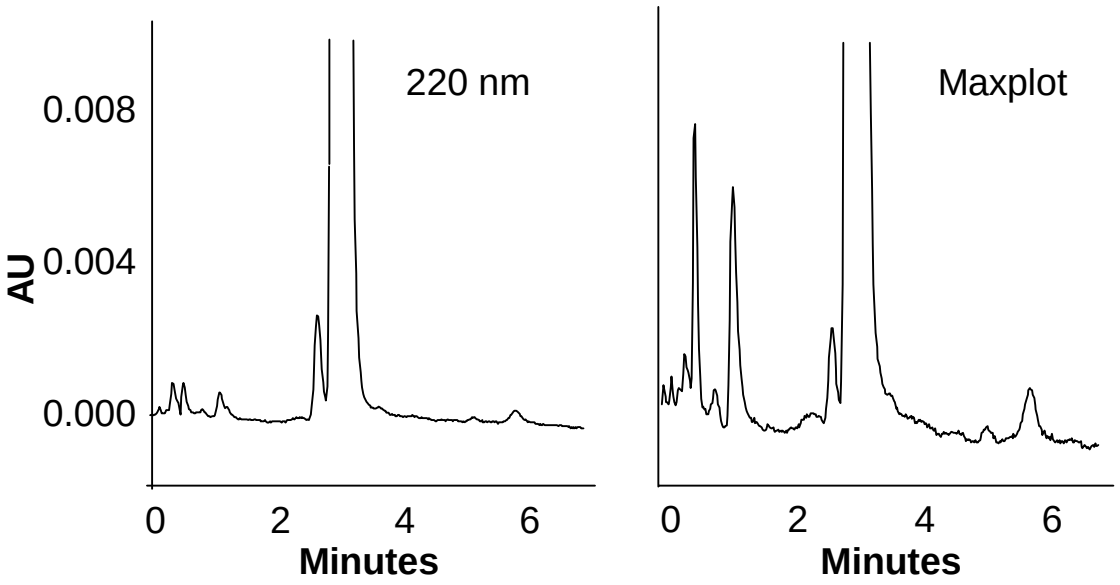
Performance PerSPECtives

Increase Waters 996 Photodiode Array Detector Sensitivity with Maxplot

With a Waters 996 Photodiode Array Detector, get the maximum chromatographic sensitivity by using Maxplot to generate a "total peak chromatogram".



An analysis of ethinylestradiol can be used to illustrate Maxplot. The left figure is a single wavelength, 220 nm, chromatogram extracted from a photodiode array (PDA) file which was collected from 190 to 350 nm. Some impurity peaks are seen.

With the Waters 996 PDA detector you do not need to choose one or more wavelengths to visualize all the peaks. Maxplot can be used to generate a summary chromatogram that shows all peaks.

Maxplot monitors the spectrum of a compound within the designated wavelengths and displays that compound at its highest absorbing wavelength for each moment during data collection. This creates a chromatogram where all peaks are shown at their lambda max (right figure) so that impurities are more readily visualized.

System:	Waters 600 Solvent Delivery
Autosampler:	Waters 717
Columns:	Waters Nova-Pak C18 3.9x75mm
Mobile Phase:	40:60 Acetonitrile:Water
Detector:	Waters 996 Photodiode Array
Wavelengths:	190-350nm, monitored 220nm
Resolution:	1.2 nm
Sample:	Ethinylestradiol

Waters

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★ PDA Detector Chromatographic Sensitivity

One of the common uses for a PDA detector is a multiwavelength detector. The need for multiple wavelengths is to monitor all the peaks within a chromatogram at their maximum absorbance wavelength. The PDA detector has an advantage over the programmable multiwavelength detectors. A wavelength range can be chosen, the data collected, and then any number of wavelengths selected (post-run).

Reviewing many chromatograms requires time. Overlays of the chromatograms and integration of the small peaks may be necessary to locate all the peaks.

In methods development, in stability testing, metabolism studies, etc. where you must locate all peaks one summary chromatogram is helpful. The Maxplot function of the Waters 996 PDA Detector is such a function.

★ Waters 996 Photodiode Array Detector

The Waters 996 Detector provides Maxplot as a derived channel. The Millennium software finds the highest absorbance at every data point and plots them in a single chromatogram. Therefore, all peaks with absorbance in the wavelength range used for data acquisition are seen. This is also called a total peak chromatogram.

Maxplot is more sensitive than a total wavelength chromatogram which is a sum of absorbances at all wavelengths.

Although the Maxplot channel can be integrated by the software, it should not be considered a mass detector because of differing response factors at each wavelength for every compound. In addition, regulatory agencies currently require quantitation at a fixed wavelength.

Maxplot is very useful as an investigative tool and during method development.