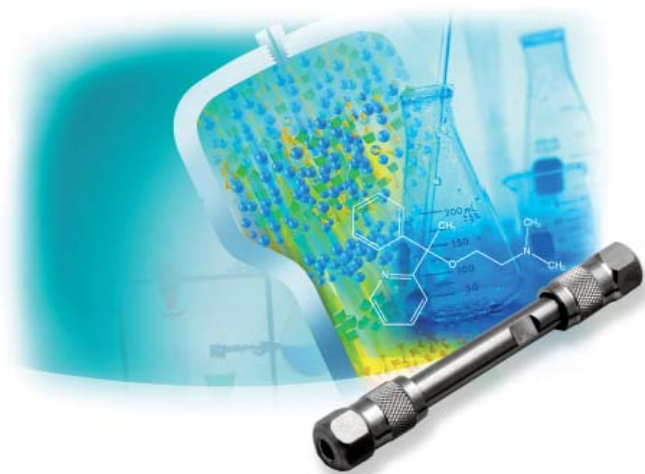


# Pursuit™ UPS<sup>1.9</sup> and Pursuit UPS<sup>2.4</sup>

## FAST UHPLC SOLUTIONS FOR ULTIMATE RESOLUTION



*Pursuit UPS columns are designed for ultimate performance on any ultra-high pressure LC system. They are available in multiple formats and complimentary chemistries on 1.9 and 2.4  $\mu\text{m}$  silica, for fast and easy method development in the high throughput, UHPLC environment.*

*Pursuit UPS<sup>1.9</sup> columns deliver sub-2  $\mu\text{m}$  efficiencies in applications where sensitivity, resolution, and throughput are critical.*

*Pursuit UPS<sup>2.4</sup> columns couple highly efficient, fast separations with superior ease-of-use. They are recommended for viscous "greener" solvent applications, or samples where lifetime and back pressure are important concerns.*

### Key Benefits

#### Pursuit UPS<sup>1.9</sup>

- ▶ Highest efficiency particles ensure optimum resolution.
- ▶ Narrow bore columns with minimal band broadening enhance sensitivity.
- ▶ Columns and chemistries selected to facilitate high throughput and fast separations.
- ▶ Orthogonal bonded chemistries allow rapid method development.

#### Pursuit UPS<sup>2.4</sup>

- ▶ Minimal clogging or back pressure issues ensure ease-of-use and enhanced column lifetimes.
- ▶ Ideal for use with "greener" viscous solvents to reduce potential environmental hazards.
- ▶ Similar efficiencies to sub-2  $\mu\text{m}$  particles.
- ▶ Available in C18 and diphenyl chemistries for maximum choice.



**VARIAN**

# Pursuit™ UPS<sup>1.9</sup> and Pursuit UPS<sup>2.4</sup>

## UPS Columns from Varian

Our UPS 1.9 and 2.4  $\mu\text{m}$  fast UHPLC columns are designed to cope with the high pressure and fast gradients demanded by today's pharmaceutical industry. UPS columns are applicable anywhere from discovery through bioanalysis, and into QA/QC.

## Pursuit UPS<sup>1.9</sup> Columns

The UPS 1.9  $\mu\text{m}$  delivers sub-2  $\mu\text{m}$  efficiencies for applications where sensitivity, resolution, and throughput are crucial. They are designed as the first choice UHPLC solution for difficult separations.

## Pursuit UPS<sup>2.4</sup> Columns

With 30 - 40% lower back pressures, and near equal efficiencies, Pursuit UPS<sup>2.4</sup> high pressure packed columns combine highly efficient, fast separations with superior ease-of-use. They are recommended for viscous or "green" solvent applications, or samples where lifetime and backpressure are an issue. Pursuit UPS columns offer tailored method development solutions for UHPLC users.

Transferring Methods to UPS 1.9 Allows for Improved Sensitivity and Speed

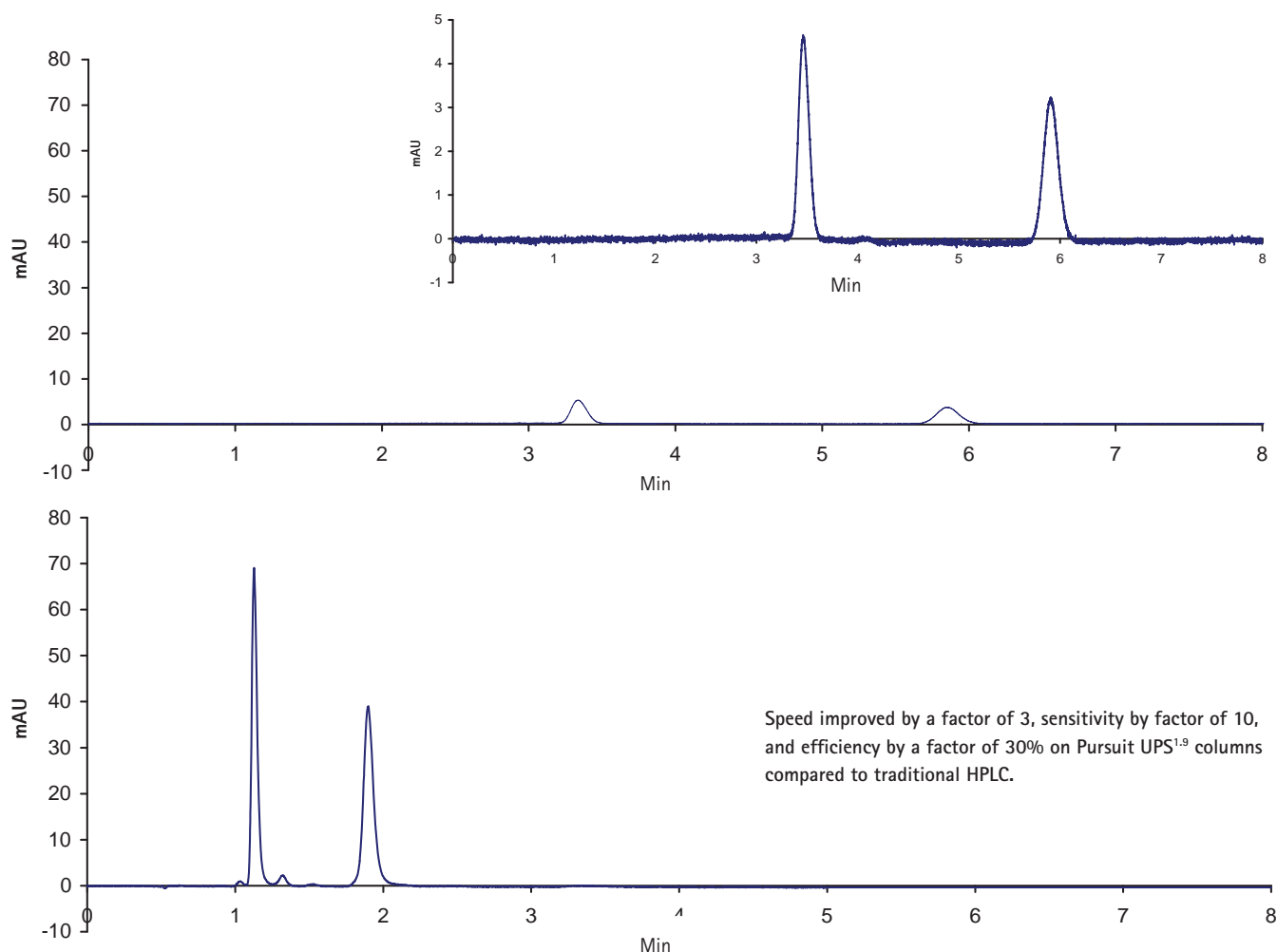


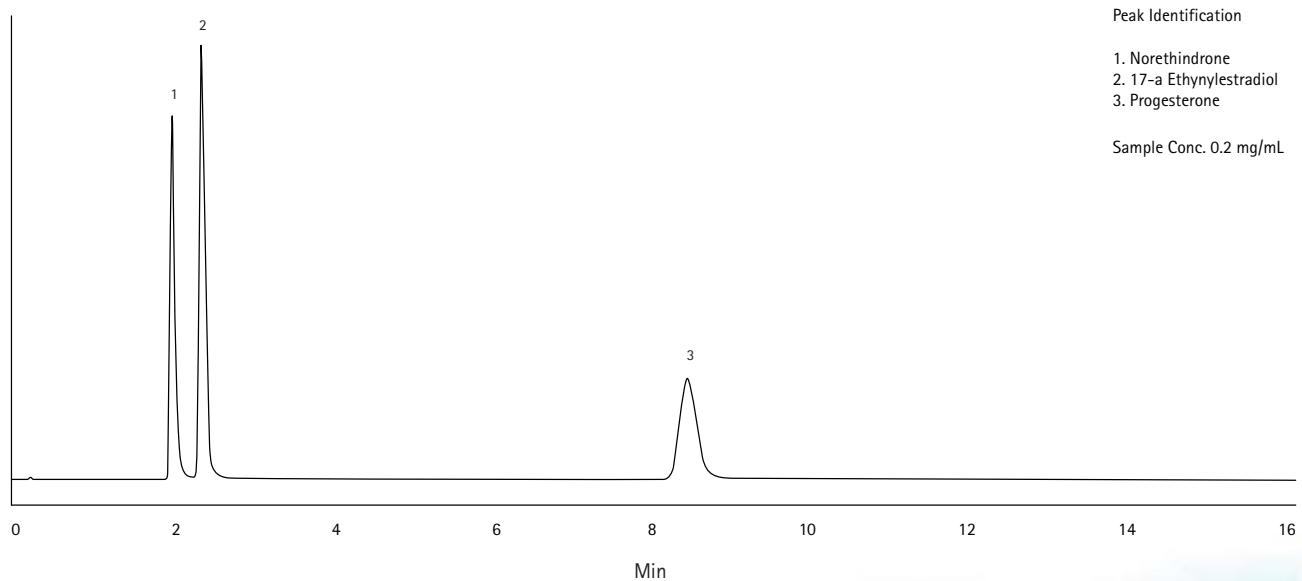
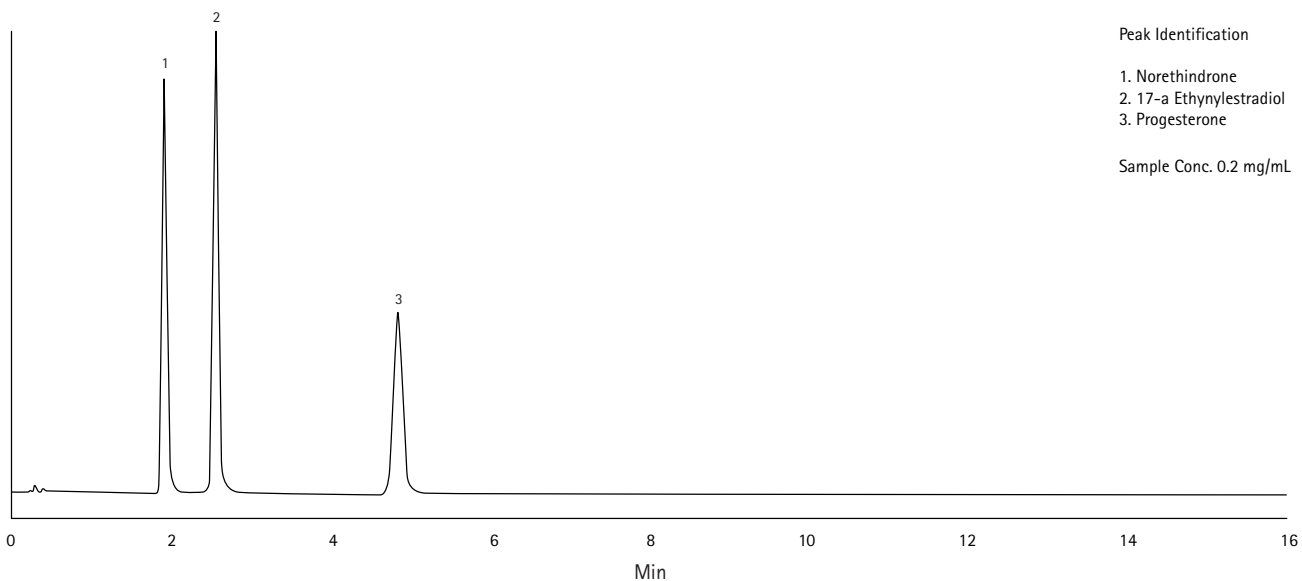
Figure 1. Antibiotics on Pursuit XRs C18 (top) and Pursuit UPS<sup>1.9</sup> C18 columns (bottom). 1  $\mu\text{L}$  injection.

## Conditions

Columns: Pursuit XRs 5  $\mu\text{m}$  C18, 250 x 4.6 mm and Pursuit UPS<sup>1.9</sup> C18, 100 x 2.0 mm  
Mobile Phase: 20 mM Sodium phosphate buffer, pH 4.4:methanol - 95:5  
HPLC Flow Rate: 1.5 mL/min, Temp: 30 °C  
UHPLC Flow Rate: 0.4 mL/min, Temp: 30 °C

# Pursuit™ UPS<sup>1.9</sup> and Pursuit UPS<sup>2.4</sup>

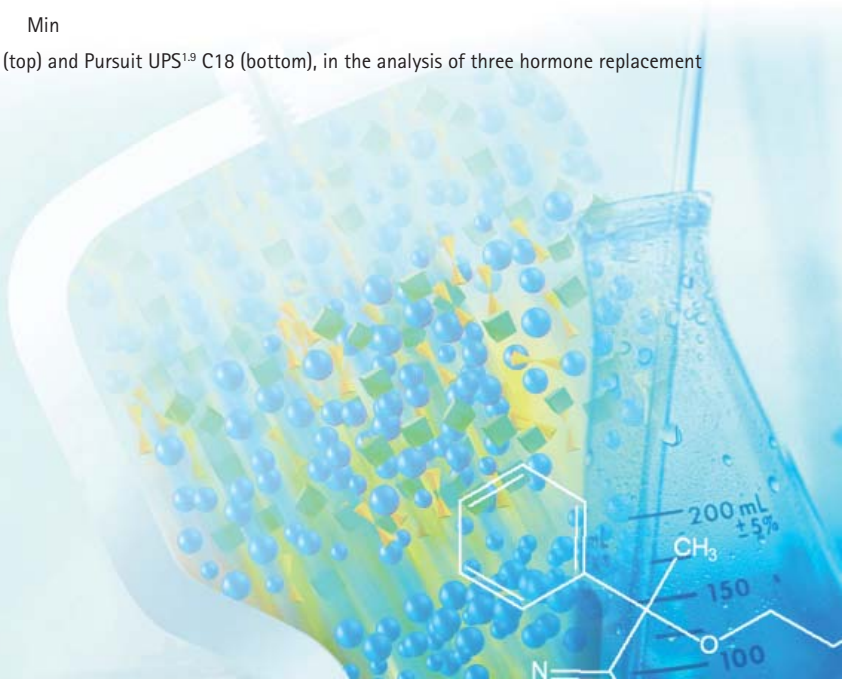
Pursuit UPS Diphenyl Can Often Offer Unique Resolution and Speed



**Figure 2.** Comparisons of Pursuit XRs 5  $\mu$ m and Pursuit UPS<sup>1.9</sup> Diphenyl (top) and Pursuit UPS<sup>1.9</sup> C18 (bottom), in the analysis of three hormone replacement steroids. Note the improvements in resolution and speed.

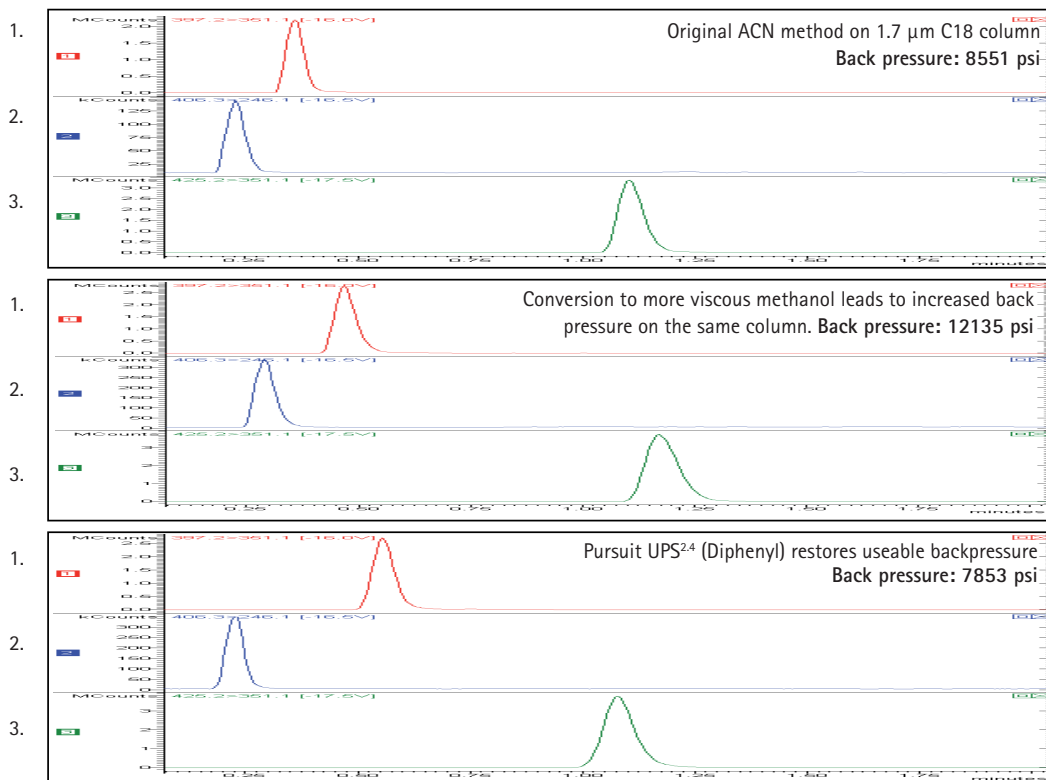
## Conditions

Mobile phase: 35% Acetonitrile in water  
Flow Rate: 0.5 mL/min  
Temp: 40 °C  
Detection: 220nm



# Pursuit™ UPS<sup>1.9</sup> and Pursuit UPS<sup>2.4</sup>

## UPS<sup>2.4</sup> Allows for Conversion of Methods to More Viscous Solvents



### Conditions

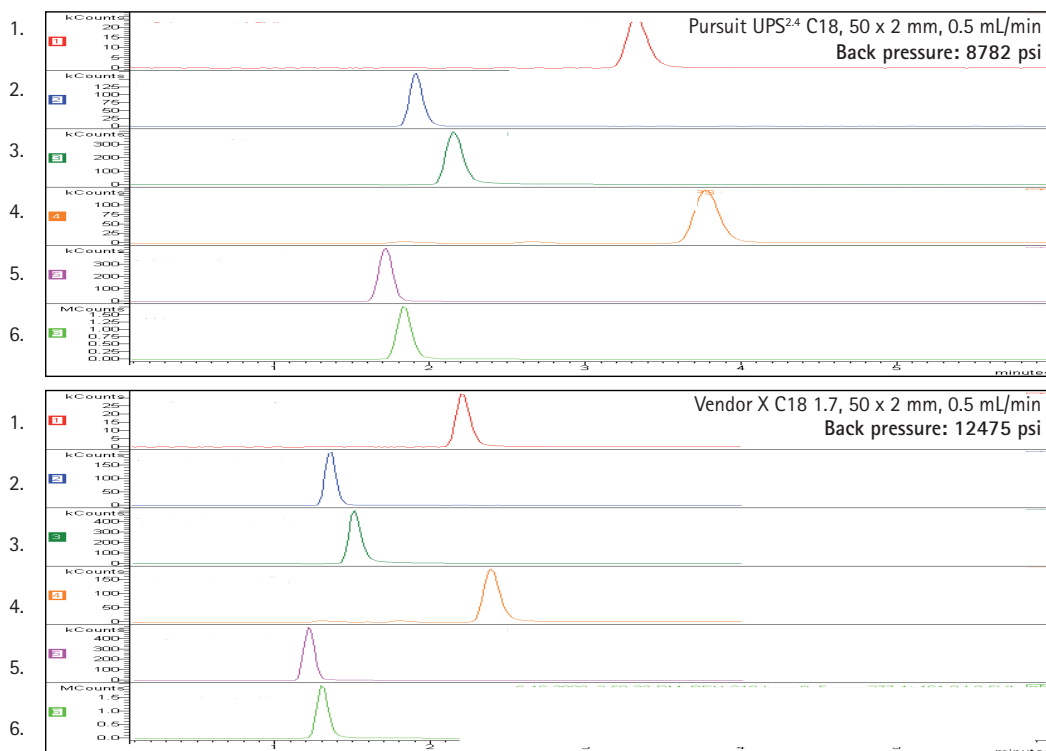
Column: Vendor X 1.7 µm C18  
Isocratic: 30% ACN w/0.1% formic, 70% 0.1% formic acid  
Flow Rate: 0.6 mL/min

Column: Vendor X 1.7 µm C18  
Isocratic: 47% MeOH w/0.1% formic, 53% 0.1% formic acid  
Flow Rate: 0.6 mL/min

Column: Pursuit UPS<sup>2.4</sup> Diphenyl  
Isocratic: 47% MeOH w/0.1% formic, 70% 0.1% formic acid  
Flow Rate: 0.6 mL/min

Figure 3. "Green" solvent conversion with Pursuit UPS<sup>2.4</sup> illustrated by the analysis of three ACE inhibitors. (1. Captopril 2. Benazeprilat, 3. Ramipril).

## 2.4 µm Particles Leads To Reduced Back Pressures



### Conditions

Pursuit UPS<sup>2.4</sup> C18,  
50 x 2 mm  
Flow Rate: 0.5 mL/min

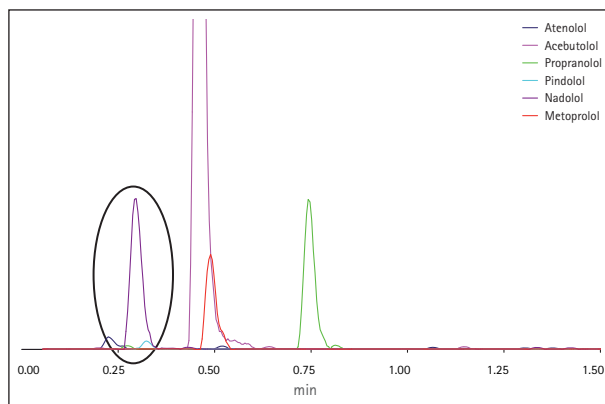
Vendor X C18 1.7 µm  
50 x 2 mm  
Flow Rate: 0.5 mL/min

Figure 4. Analysis of kava kava shows how the use of Pursuit UPS<sup>2.4</sup> greatly reduces back pressure. (1. Desmethoxyyangonin, 2. Kavain, 3. Dihydrokavain, 4. Yangonin, 5. Methysticin, 6. Dihydromethysticin).

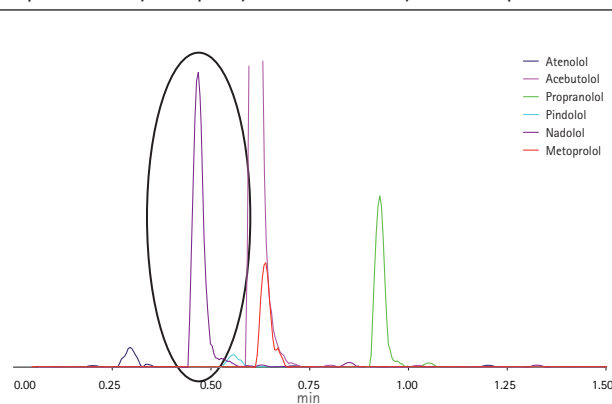
## Improve Sensitivity in Bioanalysis With Column Selectivity

Pursuit UPS is available in complimentary chemistries to facilitate rapid method development. Offering truly orthogonal selectivity, Pursuit UPS Diphenyl focuses on differences in aromaticity, conjugation, and electron density, to improve the chances of achieving critical pair separation when the hydrophobic selectivity of C18 is not enough.

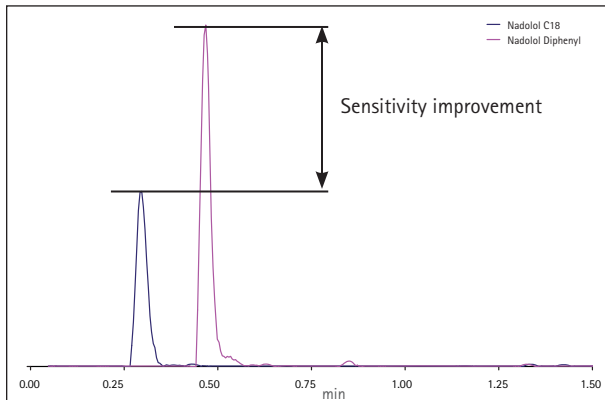
### Separation of Beta Blockers on Pursuit UPS<sup>1.9</sup> C18



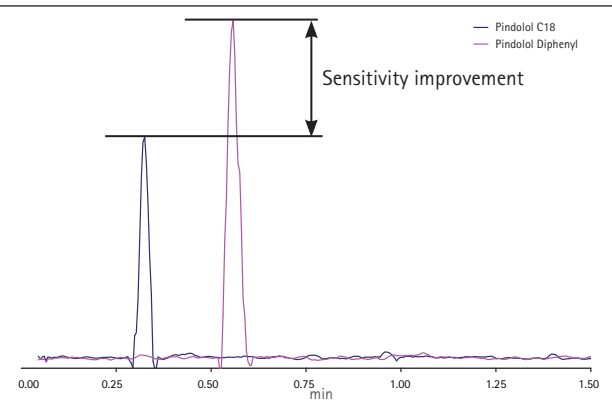
### Unique Selectivity of Diphenyl Holds Moderately Polar Compounds From Void



### Sensitivity Improvement of Nadolol on Pursuit UPS<sup>1.9</sup> Diphenyl Over C18



### Sensitivity Improvement of Pindolol on Pursuit UPS<sup>1.9</sup> Diphenyl Over C18



### Post Column Studies of Pinadol Explain the Sensitivity Gains

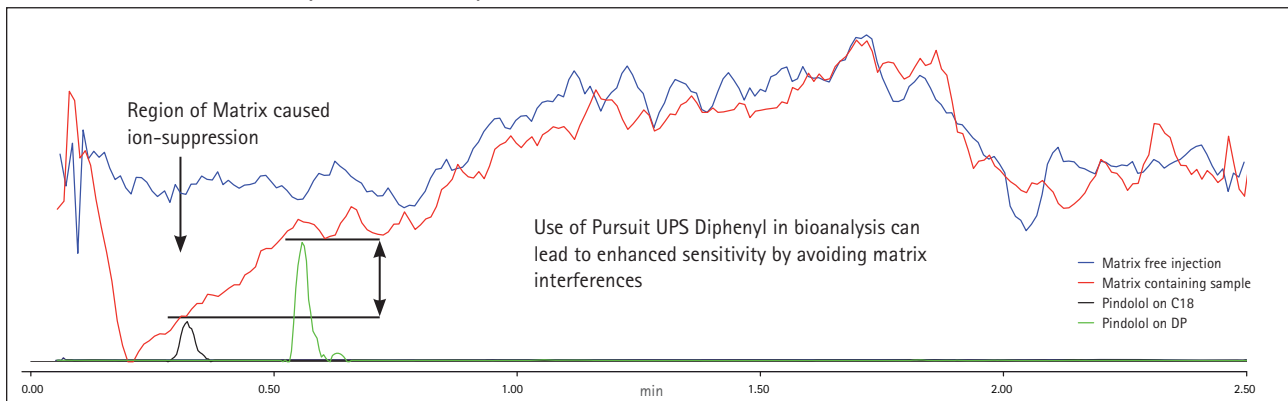
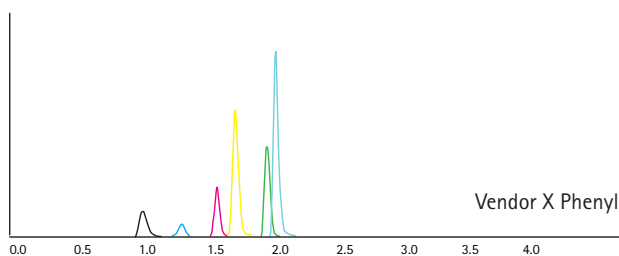
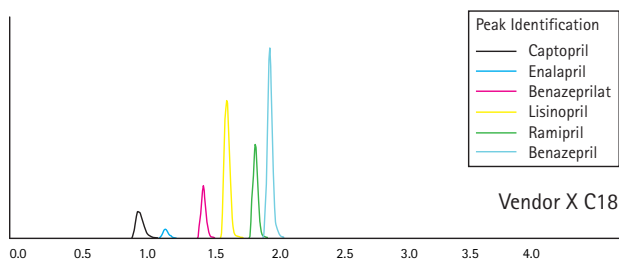


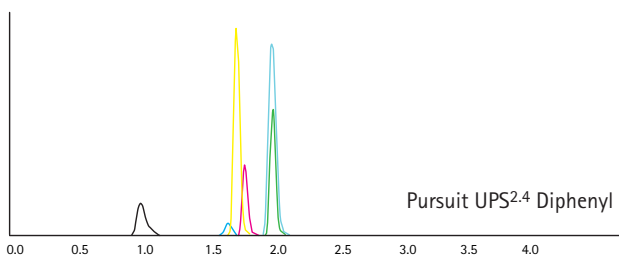
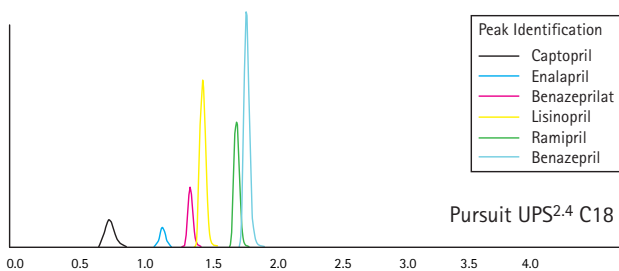
Figure 5. Sensitivity enhancements in LC/MS/MS bioanalysis using the unique selectivity of Pursuit UPS Diphenyl.

# Pursuit™ UPS<sup>1.9</sup> and Pursuit UPS<sup>2.4</sup>

Some Vendors Column Offerings Show No Difference in Selectivity



Varian Offers Truly Unique Selectivities



**Figure 6.** Separation of ACE inhibitors demonstrates the orthogonality of Pursuit UPS Diphenyl.

Pursuit UPS columns are designed for enhanced performance with ultra-high pressure, low dead volume chromatographic systems. To achieve similar results on conventional systems, please use our Pursuit Ultra products. See [www.varianinc.com](http://www.varianinc.com) for details.

## Specifications

Pursuit UPS 1.9 and 2.4  $\mu$ m Fast UHPLC Columns

Property	UPS 2.4	UPS 1.9
Specific surface area (m <sup>2</sup> /g)	350	350
Pore size (Å)	100	100
Pore volume (mL/g)	0.9	0.9
Particle size dp (dp <sub>90</sub> / dp <sub>10</sub> <1.8) ( $\mu$ m)	2.4	1.9
Carbon loading (% C)		
C18	21	21
Diphenyl	13	13
Ligand coverage ( $\mu$ mole/m <sup>2</sup> )		
C18	3.0	3.0
Diphenyl	2.8	2.8
pH Range		
C18	1.5-10	1.5-10
Diphenyl	1.5-8	1.5-8

## Ordering Information

Pursuit UPS High Pressure Packed Fast LC Columns

Description	UPS 2.4
Pursuit UPS <sup>1.9</sup> C18 30 x 2.0 mm-HPP*	A8000030X020H
Pursuit UPS <sup>1.9</sup> C18 50 x 2.0 mm-HPP	A8000050X020H
Pursuit UPS <sup>1.9</sup> C18 50 x 3.0 mm-HPP	A8000050X030H
Pursuit UPS <sup>1.9</sup> C18 100 x 2.0 mm-HPP	A8000100X020H
Pursuit UPS <sup>1.9</sup> C18 100 x 3.0 mm-HPP	A8000100X030H
Pursuit UPS <sup>1.9</sup> Diphenyl 30 x 2.0 mm-HPP	A8020030X020H
Pursuit UPS <sup>1.9</sup> Diphenyl 50 x 2.0 mm-HPP	A8020050X020H
Pursuit UPS <sup>1.9</sup> Diphenyl 50 x 3.0 mm-HPP	A8020050X030H
Pursuit UPS <sup>1.9</sup> Diphenyl 100 x 2.0 mm-HPP	A8020100X020H
Pursuit UPS <sup>1.9</sup> Diphenyl 100 x 3.0 mm-HPP	A8020100X030H
Pursuit UPS <sup>2.4</sup> C18 30 x 2.0 mm-HPP	A8100030X020H
Pursuit UPS <sup>2.4</sup> C18 50 x 2.0 mm-HPP	A8100050X020H
Pursuit UPS <sup>2.4</sup> C18 50 x 3.0 mm-HPP	A8100050X030H
Pursuit UPS <sup>2.4</sup> C18 100 x 2.0 mm-HPP	A8100100X020H
Pursuit UPS <sup>2.4</sup> C18 100 x 3.0 mm-HPP	A8100100X030H
Pursuit UPS <sup>2.4</sup> Diphenyl 30 x 2.0 mm-HPP	A8120030X020H
Pursuit UPS <sup>2.4</sup> Diphenyl 50 x 2.0 mm-HPP	A8120050X020H
Pursuit UPS <sup>2.4</sup> Diphenyl 50 x 3.0 mm-HPP	A8120050X030H
Pursuit UPS <sup>2.4</sup> Diphenyl 100 x 2.0 mm-HPP	A8120100X020H
Pursuit UPS <sup>2.4</sup> Diphenyl 100 x 3.0 mm-HPP	A8120100X030H

\*High Pressure Packed

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**Europe The Netherlands:** 31.118.67.1000  
**Asia Pacific Australia:** 613.9560.7133  
**Latin America Brazil:** 55.11.3238.0400

Other sales offices and dealers throughout the world—  
 check our Web site.



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