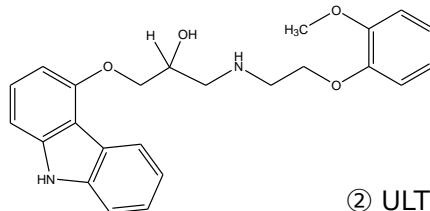


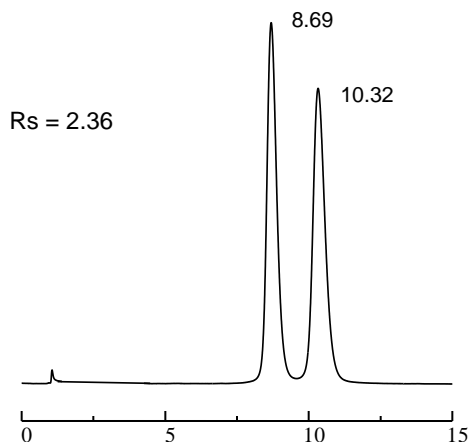
## Analysis of carvedilol using the ULTRON ES-OVM (3 $\mu\text{m}$ )

Shown below are comparative analyses of carvedilol performed using ULTRON ES-OVM 5  $\mu\text{m}$  (150 x 4.6 mm I.D.) and ULTRON ES-OVM 3  $\mu\text{m}$  (100 x 3.0 mm I.D.) columns.

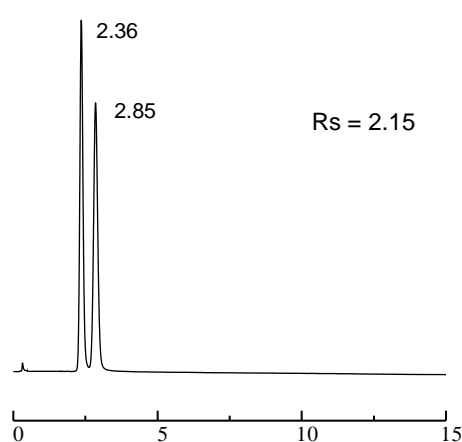
### ■ Faster analyses



① ULTRON ES-OVM (5  $\mu\text{m}$ )  
150 x 4.6 mm I.D.



② ULTRON ES-OVM (3  $\mu\text{m}$ )  
100 x 3.0 mm I.D.



\*Resolution values will differ depending on the specifications of the system used.

Column: ULTRON ES-OVM (5  $\mu\text{m}$ )/ULTRON ES-OVM (3  $\mu\text{m}$ )  
 Column size: 150 x 4.6 mm I.D./100 x 3.0 mm I.D.  
 Column temp.: 25°C  
 Mobile phase: 20 mM  $\text{KH}_2\text{PO}_4$  + 20 mM  $\text{K}_2\text{HPO}_4$  (pH 7.0)/ $\text{CH}_3\text{CN}$   
 = 75/25  
 Flow rate: 1.0 mL/min

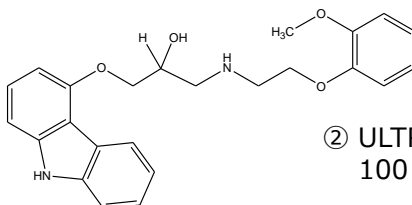
Detection: UV-240 nm  
 Sample: Carvedilol 200 mg/L (in ethanol)  
 Injection vol.: 2.0  $\mu\text{L}$  (ES-OVM, 5  $\mu\text{m}$  150 x 4.6 mm I.D.)  
 0.5  $\mu\text{L}$  (ES-OVM, 3  $\mu\text{m}$  100 x 3.0 mm I.D.)

Features of the ES-OVM (3  $\mu\text{m}$ ) (compared to the 5  $\mu\text{m}$  column)

- Maximum operating pressure of 30 MPa.
- Can be used in LC/MS systems as well.
- Employs a 3  $\mu\text{m}$  packing material for higher peak resolution and theoretical plate numbers.
- Enables significant reductions in analysis times while maintaining high theoretical plate numbers.
- Enables further improvements in performance with optimization of LC system tubing and flow cells.
- 9 column length and inner diameter combinations available.

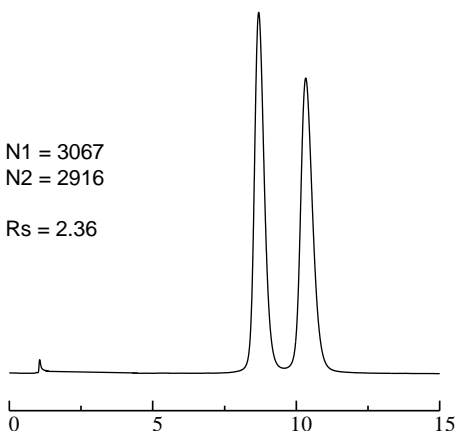
## ■ Greater analytical performance (high resolution)

① ULTRON ES-OVM (5  $\mu$ m)  
150 x 4.6 mm I.D.

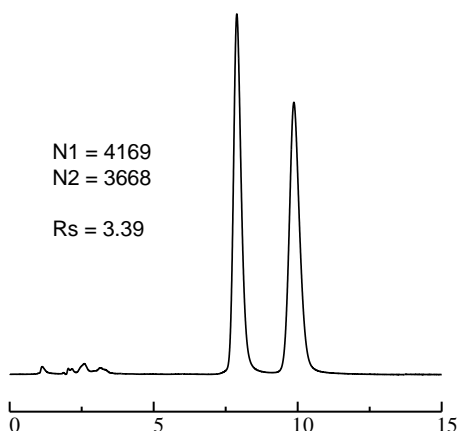


② ULTRON ES-OVM (3  $\mu$ m)  
100 x 3.0 mm I.D.

N1 = 3067  
N2 = 2916  
Rs = 2.36



N1 = 4169  
N2 = 3668  
Rs = 3.39



\* Theoretical plate numbers and resolution values will differ depending on the specifications of the system used.

Column: ULTRON ES-OVM (5  $\mu$ m)/ULTRON ES-OVM (3  $\mu$ m)  
Column size: 150 x 4.6 mm I.D./100 x 3.0 mm I.D.  
Column temp.: 25°C  
Mobile phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> + 20 mM K<sub>2</sub>HPO<sub>4</sub> (pH 7.0)/CH<sub>3</sub>CN = 75/25  
Flow rate: 1.0 mL/min (ES-OVM, 5  $\mu$ m 150 x 4.6 mm I.D.)  
0.28 mL/min (ES-OVM, 3  $\mu$ m 100 x 3.0 mm I.D.)

Detection: UV-240 nm  
Sample: Carvedilol 200 mg/L (in ethanol)  
Injection vol.: 2.0  $\mu$ L (ES-OVM, 5  $\mu$ m 150 x 4.6 mm I.D.)  
0.5  $\mu$ L (ES-OVM, 3  $\mu$ m 100 x 3.0 mm I.D.)

## ULTRON ES-OVM (3 $\mu$ m) line-up

Application	Semi-micro LC	Semi-micro LC Conventional LC	Conventional LC
Column dimensions Length x I.D. (mm)	50 x 2.1	50 x 3.0	50 x 4.6
	100 x 2.1	100 x 3.0	100 x 4.6
	150 x 2.1	150 x 3.0	150 x 4.6



Please feel free to contact us with questions related to analyses.  
Column screening services are also available.

Please be aware that specifications are subject to change without prior notification.