VDSpher® Core Shell Mode Phases

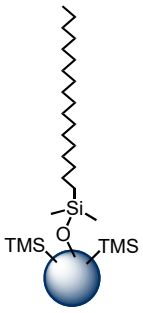
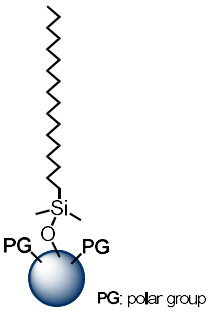
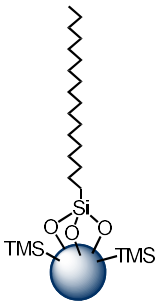
Fully Porous Particles for Versitale Column Performance

VDSpher Core Shell Mode phases are a further development of the existing VDSpher product portfolio for the field of analytical chromatography. VDSpher Core Shell Mode columns represent a versatile alternative to columns packed with superficially porous particles.

Superficially porous particles (SPPs) – often also called Fused-Core®, core shell or porous shell – are characterized by a solid core and a porous outer layer (shell). SPPs columns enable very high efficiency while ensuring modest operating pressures simultaneously compared to fully porous sub-2 µm particles. Despite these advantages, users repeatedly report difficulties regarding reproducibility of chromatographic analyses and critise the high costs of analytical SSPs columns.

In order to offer customers a cost-effective alternative to SPPs columns, VDS optilab extends its existing product portfolio and launches the so-called VDSpher Core Shell Mode (CSM) phases. 3 different VDSpher CSM modifications and 2.5 µm in particle size are currently available.

VDSpher Core Shell Mode Modifications and Specifications

	VDSpher CSM C18-E	VDSpher CSM C18-AQ	VDSpher CSM C18-M-SE
MODIFICATION	monomeric bonded C18	monomeric bonded C18	polymeric bonded C18
			
PARTICLE SIZE	2.5 µm	2.5 µm	2.5 µm
CARBON CONTENT	6.7%	5.3%	10.2%
ENCAPPING	yes / liquid phase	yes / hydrophilic	yes / gas phase
USP CLASSIFICATION	L1	L1	L1
pH STABILITY	2 – 7.5	2 – 7.5	1.5 – 9.5
H_2O COMPATIBILITY	≤ 95%	100%	≤ 95%
SURFACE AREA	100 $m^2 \cdot g^{-1}$	100 $m^2 \cdot g^{-1}$	100 $m^2 \cdot g^{-1}$

VDSpher® Core Shell Mode Phases

VDSpher CSM phases are based on high purity silica gel with a metal content < 20 ppm. In combination with a specially designed fully porous pore system, the 2.5 µm particle size materials enable versatile column performance comparable with SPPs columns. Especially developed packing methods result in high density column beds with plate numbers up to 160.000 N·m^{-1} and allow for operating pressures up to 550 bar.

VDSpher Core Shell Mode Column Performance

Particle Size: 2.5 µm

Column Dimension:

100 × 4.6 mm

Compounds:

1 Benzene

2 Naphthalene

3 Anthracene

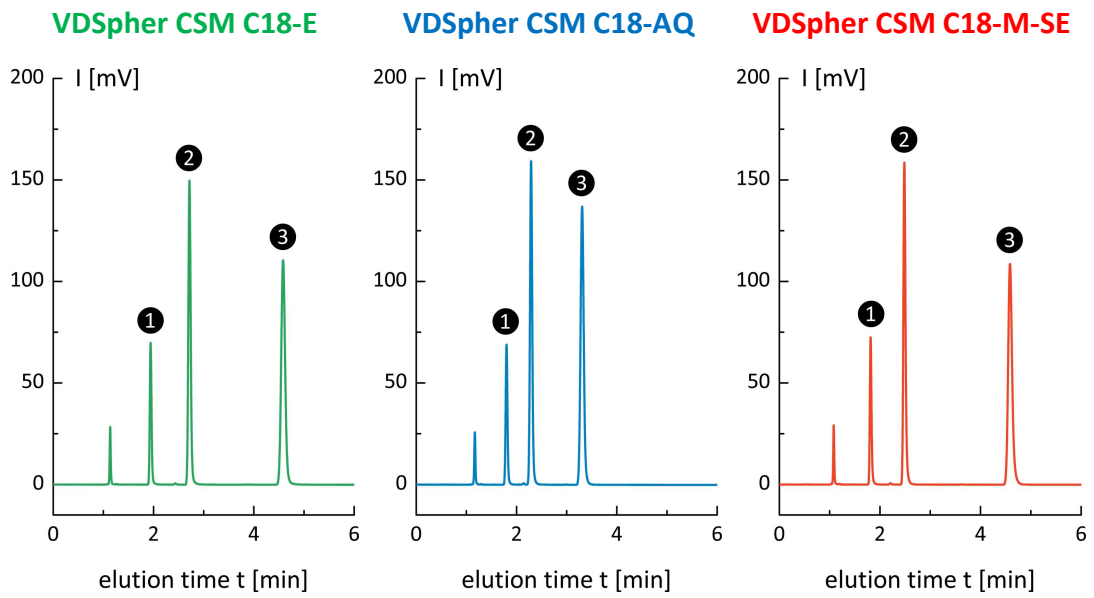
Conditions:

65% MeCN / 35% H_2O

Flow Rate: 1.0 mL·min^{-1}

Temperature: 28 °C

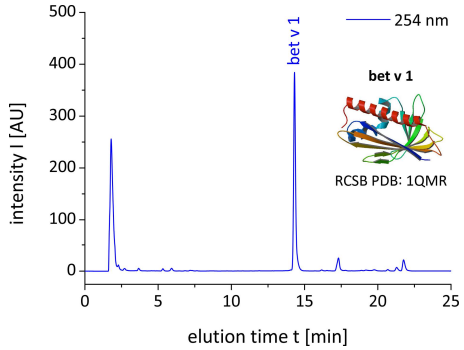
Detection: UV 254 nm



	VDSpher CSM C18-E	VDSpher CSM C18-AQ	VDSpher CSM C18-M-SE
PRESSURE	145 bar	141 bar	156 bar
PEAK SYMMETRY	1.10	1.07	1.21
PLATE NUMBER	160.000 N·m^{-1}	126.000 N·m^{-1}	164.000 N·m^{-1}

Application Note: Analysis of Birch Pollen Extract

Pollen are among the most frequent sources of allergy triggers. Especially the mayor allergen **Bet v 1** from birch pollen of *Betula pendula* (*B. pendula*) has a great impact for allergology since a lot of allergy triggers from other pollen or plant-based foods show structural similarities.



HPLC chromatogram of a birch pollen extract of *B. pendula* containing the mayor birch pollen allergen **Bet v 1** detected at 254 nm.

Pollen extracts are commonly used for allergy testing. A **VDSpher CSM C18-AQ, 2.5 µm, 100 ×4.6 mm** column allows for the analysis of a birch pollen extract of *B. pendula*. UV detection at 254 nm shows excellent peak shape of the mayor allergen **Bet v 1**.

Phase / Particle Size:	VDSpher CSM C18-AQ 2.5 µm
Column Dimension:	100 × 4.6 mm
Mobile Phase:	ELUENT A: H_2O with 0.05% formic acid (v/v)
	ELUENT B: MeCN with 0.05% formic acid (v/v)
Elution Conditions:	0 – 3 min: 11% B, 3 – 15 min: 11 – 17% B,
	15 – 24 min: 17 – 20% B, 24 – 25 min: 20 – 50% B
Flow Rate:	0.8 mL·min^{-1}
Temperature:	22 °C
Detection:	UV 254 nm **Bet v 1**
Pressure:	175 bar