



SWEDISH EXCELLENCE IN NANOPOROUS SILICA

SVEA® HPLC Columns



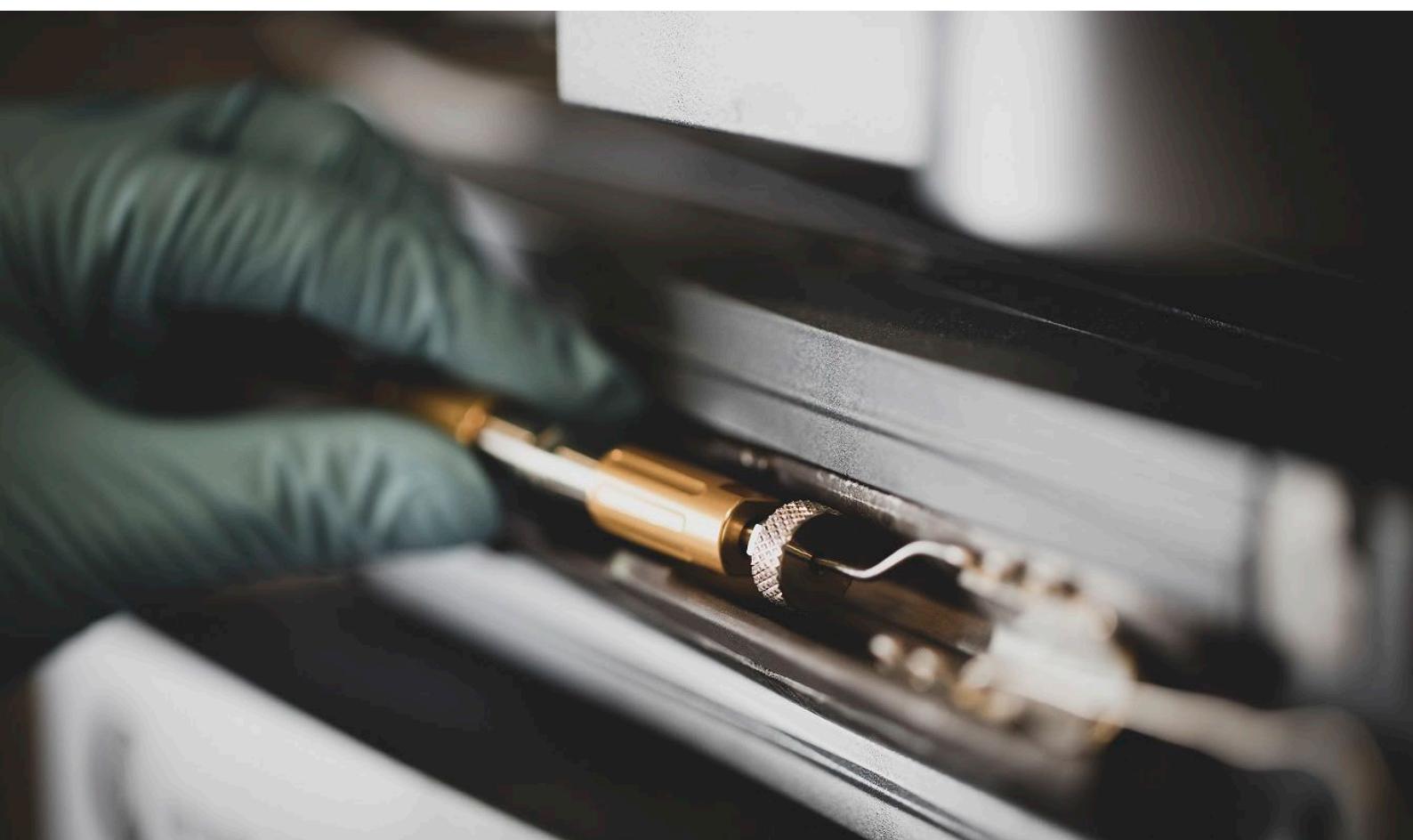
ABOUT SVEA® COLUMNS

Nanologica offers best-in-class (U)HPLC analytical columns that provide excellent chromatographic performance with sharp peak shapes and robust performance under extreme pH conditions (<1 and > 10 respectively).

The unique surface chemistry and controlled particle properties of Nanologica's proprietary silica, result in low back pressures and high plate numbers. With an exceptionally strong silica backbone, SVEA® columns offer long life cycles.

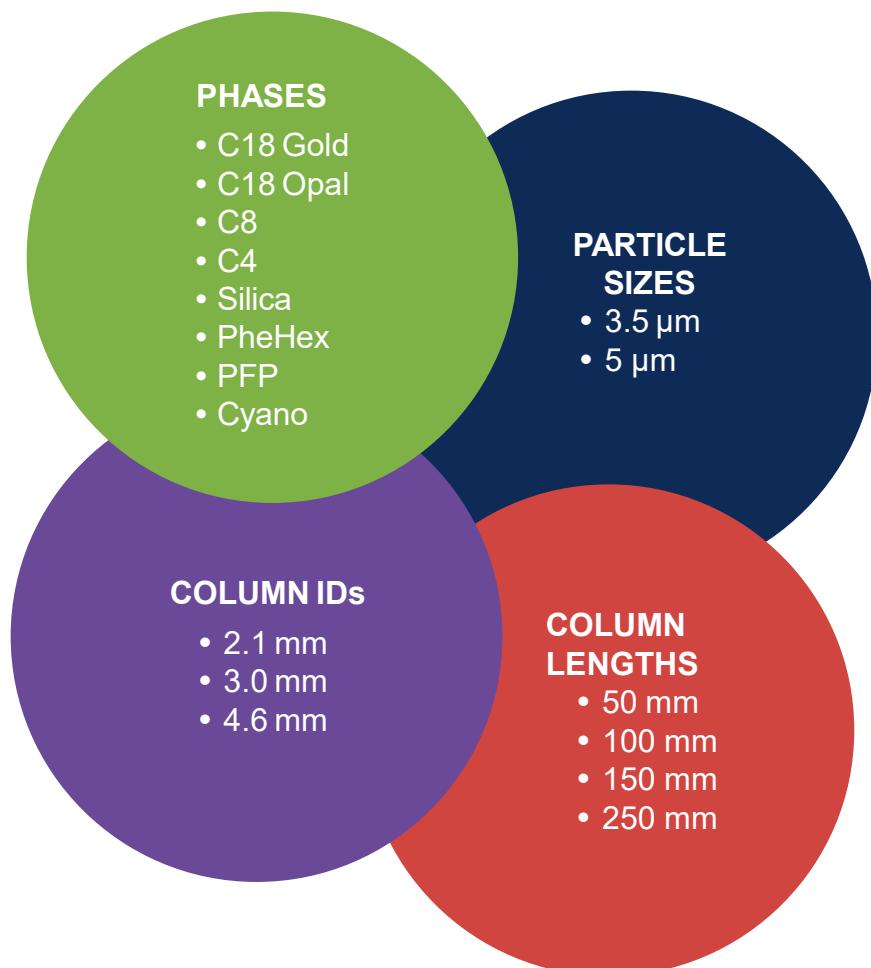
SVEA® columns gives excellent selectivity across a wide range of chemistry needs.

We take pride in the quality, design and performance of our products. They embody our core value: Swedish Excellence in Nanoporous Silica.





Nanologica offers best-in-class HPLC columns
with a broad portfolio of bonded phases



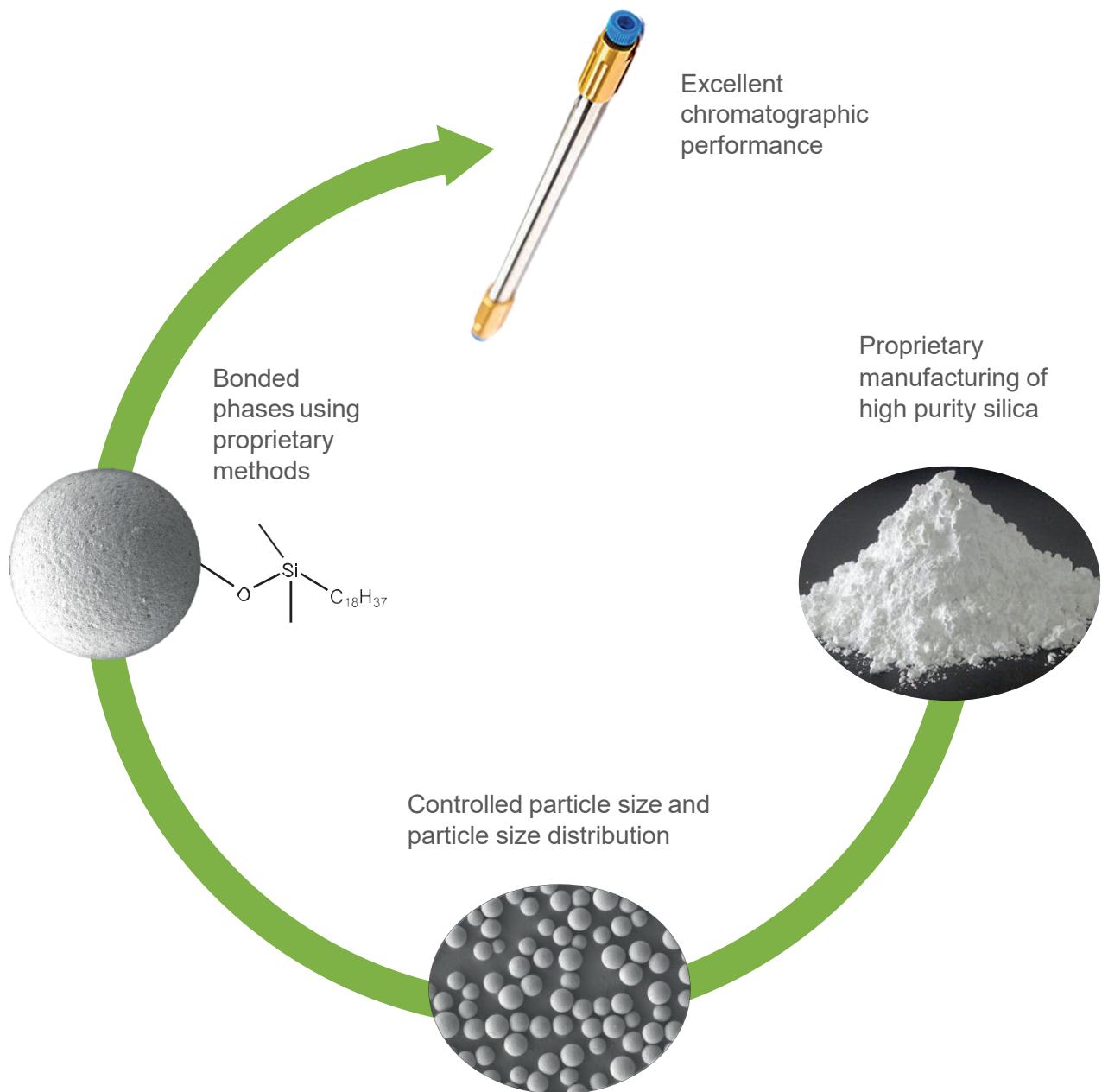
Other phases and dimensions available on request. Regarding silica for preparative chromatography please contact us or refer to www.nanologica.com for more information.

Content

From Silica to Columns	6
Silica Production and Functionalisation	7
Reproducibility	8
Durability	9
Bed Stability and Column Life Cycle	10
Column Selection Guide	11
SVEA® C18 Gold	12
SVEA® C18 Opal	15
SVEA® C8	17
SVEA® C4	20
SVEA® Phenyl-Hexyl	22
SVEA® PFP	24
SVEA® Cyano	26
SVEA® Silica	28
Article Numbers	39

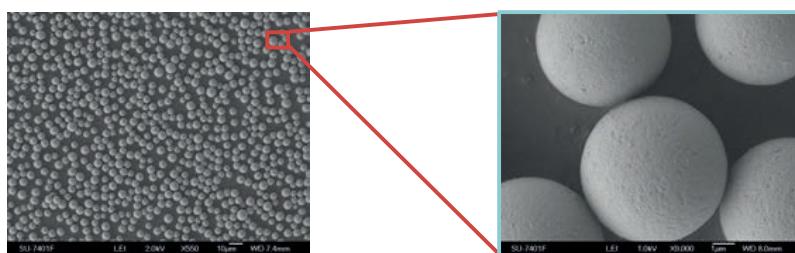
FROM SILICA TO COLUMNS

Nanologica has been producing, modifying and coating silica for several years. Modern technology and demanding quality control is deployed at each step of the manufacturing process to ensure highest possible product performance. The extensive experience and knowledge in silica chemistry, along with internal control of the entire value chain, guarantees exceptional quality and excellent batch to batch reproducibility.



SILICA PRODUCTION AND FUNCTIONALISATION

Nanologica manufactures spherical porous silica particles with controlled pore size, particle size, and particle size distribution, resulting in excellent chromatographic properties. The Scanning Electron Microscope (SEM) image below shows perfect spherical shapes and narrow particle size distribution with no fines or crushed particles. The magnified image shows perfectly smooth silica surfaces with no irregularities.



Nanologica offers a range of phases with different and complementary chromatographic properties. The functionalisation is performed using proprietary production protocols, to produce densely functionalised and end-capped silica particles with low residual silanol activity. The coated silica particles exhibit excellent chromatographic performance and outstanding chemical stability.

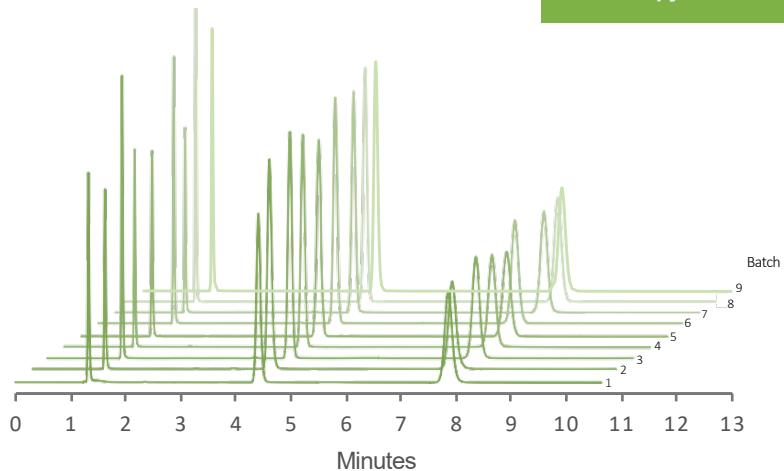
Stationary phase	Chemical structure	End-capped	USP code
Silica		No	L3
C18 Gold C18 Opal		Yes	L1
C8		Yes	L7
C4		Yes	L26
Phenyl-Hexyl		Yes	L11
PFP (Pentafluorophenyl)		Yes	L43
Cyano		Yes	L10

REPRODUCIBILITY

Nanologica's coating shows high batch to batch reproducibility for both retention times and efficiencies.

Column SVEA® C18 Gold 150x4.6 mm 5 µm
Mobile phase Acetonitrile/H₂O 70/30%
Flow rate 1.0 ml/min
Temperature 30°C
Detection UV 210 nm

Analytes:
1. Uracil
2. Toluene
3. Propylbenzene

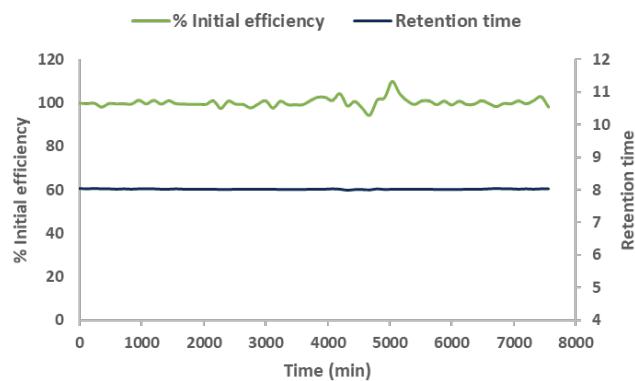


DURABILITY

The SVEA® columns show excellent durability in harsh acidic as well as harsh basic conditions. Both efficiencies and retention times remain almost unaffected even after more than 7 000 column volumes, as shown in the stability tests below.

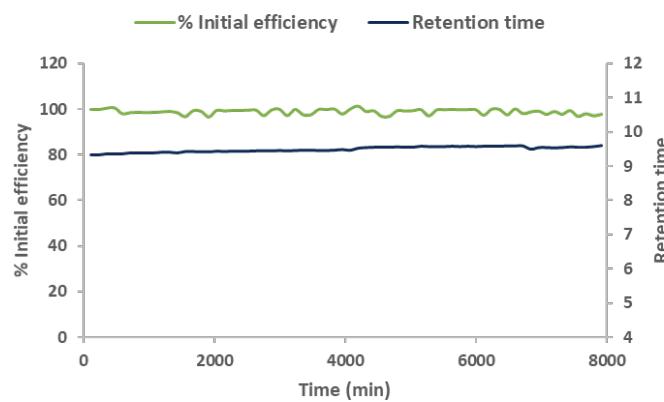
ACIDIC CONDITIONS

Column	SVEA® C18 Gold 100x4.6 mm 5 µm	Gradient cycle	10-90% B in 5 min
Mobile phase	A - 1% TFA in water, pH 0.9; B - 1% TFA in acetonitrile		90% B for 2 min
Flow rate	1.0 ml/min		90-10% B in 1 min
Temperature	60°C		10% B for 2 min
Analyte	Ethylbenzene		



BASIC CONDITIONS

Column	SVEA® C18 Gold 100x4.6 mm 5 µm	Gradient cycle	10-90% B in 5 min
Mobile phase	A - 10 mM ammonium bicarbonate, pH 9.6; B - Acetonitrile		90% B for 2 min
Flow rate	1.0 ml/min		90-10% B in 1 min
Temperature	45°C		10% B for 2 min
Analyte	Progesterone		

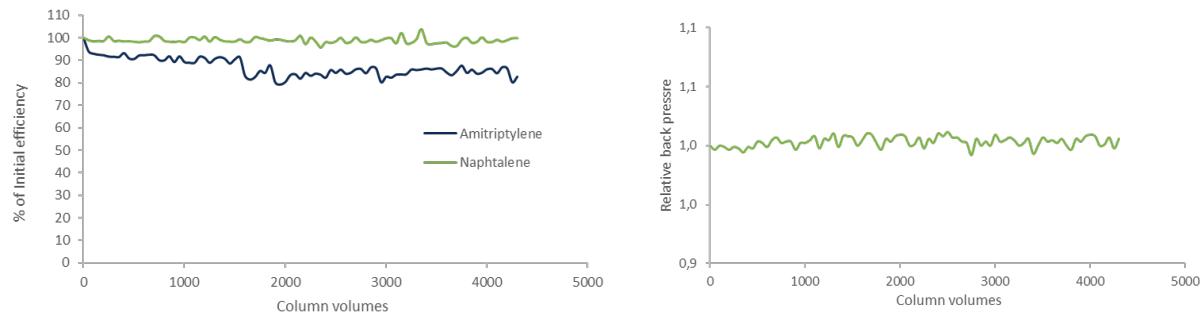


BED STABILITY

Bed stability testing shows maintained efficiency and stable back pressure after close to 100 000 column volumes.

BED STABILITY

Column	SVEA® C18 Gold 100x3.0 mm 5 µm
Mobile phase	20 mM Potassium phosphate buffer at pH 2.7/MeOH 40/60
Flow rate	0.5 ml/min
Temperature	30°C
Analyte	Amitriptylin, Naphtalene



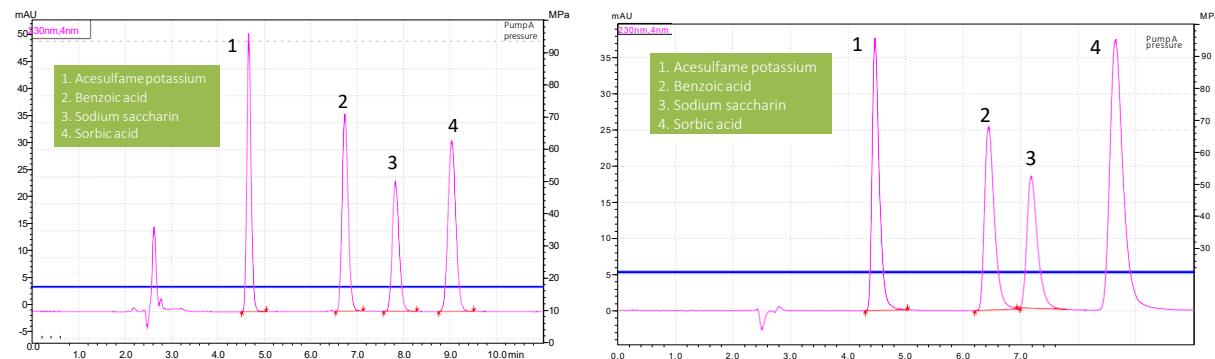
COLUMN LIFE CYCLE

The long life cycle of the SVEA® columns is demonstrated by preserved separation capacity even after 1 700 column injections when analyzing a food sample.

LIFE CYCLE

Column	SVEA® C18 Gold 250x4.6 mm 5 µm
Mobile phase	Methanol: 20mmol/L Ammonium Acetate=20:80 (v:v)
Flow rate	1.0 ml/min
Temperature	35°C
Analyte	Acesulfame potassium, Benzoic acid, Sorbic acid, Sodium saccharide

Separation of acesulfame potassium, benzoic acid, sodium saccharin and sorbic acid. Analytical sample prepared from preserves widely used in food industry. Data kindly provided by SinoUnison Technology Co., Ltd., China.



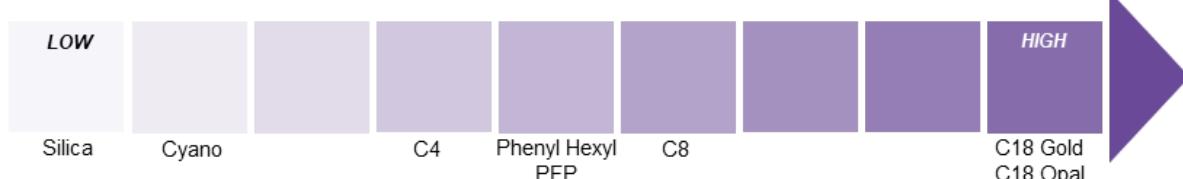
Separation after one injection using a new SVEA® C18 Gold column.

Separation after 1700 injections.

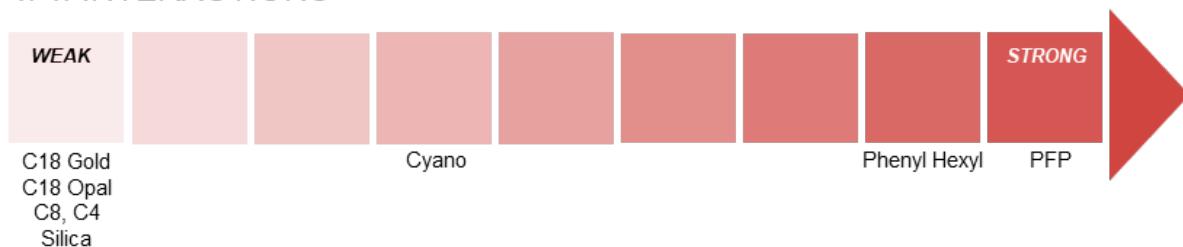
COLUMN SELECTION GUIDE

Different kinds of functionalisation offer different interaction mechanisms between the stationary phase and analytes, to fit a wide range of applications. The figure below is a guideline for reverse phase chromatography, for choosing the right type of bonded phase depending on the interaction between the analyte and the stationary phase.

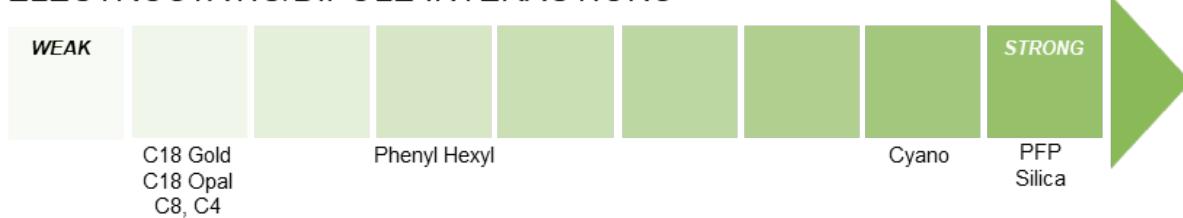
HYDROPHOBICITY



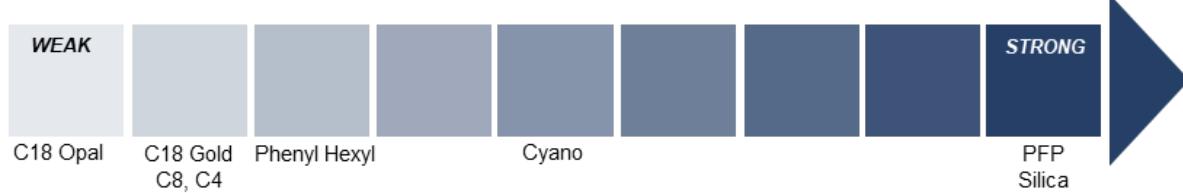
$\pi-\pi$ INTERACTIONS



ELECTROSTATIC/DIPOLE INTERACTIONS



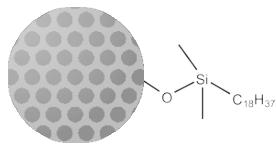
HYDROGEN BONDING



SVEA® C18 Gold

Silica:	Type B Silica
Particle size:	3.5, 5 μm
Surface area:	300 m^2/g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	19%
Ligand density:	3.7 $\mu\text{mol}/\text{m}^2$
Bonded phase:	Dimethyloctadecylsilane
End-capping:	Yes
USP code:	L1
pH range:	1-10

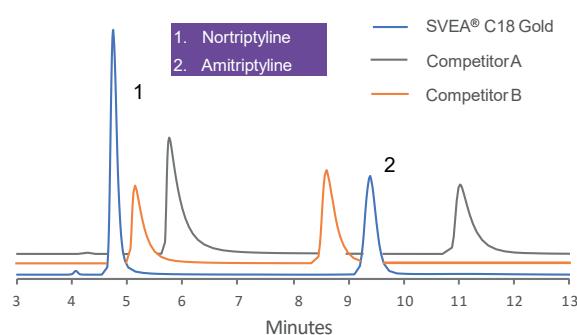
- General first choice column
- High hydrophobic retention
- Wide range of analytes
- Excellent peak shape for acids and bases



SVEA® C18 Gold is the first-choice LC column for a wide range of analytes. The high carbon load provides high retention and selectivity for compounds with moderate to high lipophilicity. Thorough end-capping combined with very low acidity and homogenously distributed residual silanol groups result in excellent peak shape and efficiencies with bases as well as acidic compounds.

Comparison of peak shapes and retention times of nortriptyline and amitriptyline

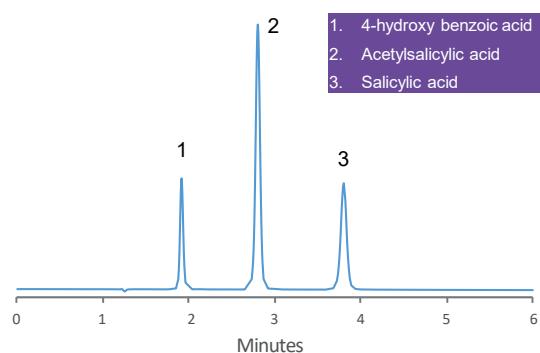
Column	SVEA® C18 Gold 150x4.6 mm 5 μm
Mobile phase	20% 25 mM KH ₂ PO ₄ , pH 7.0 80% methanol
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 210 nm



Thorough end-capping and low polarity of the silica surface of SVEA® C18 Gold gives significantly better peak shapes of anti-depressants, compared to competitor brands.

Acetylsalicylic acid and related compounds

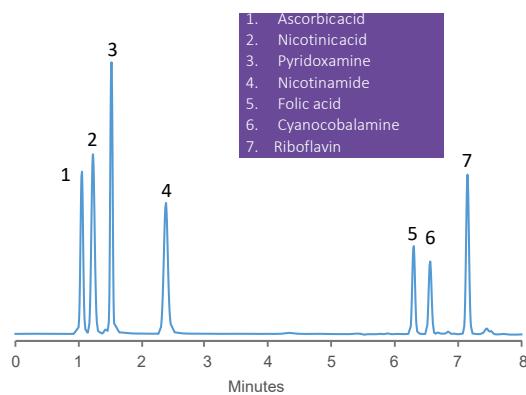
Column	SVEA® C18 Gold 150x4.6 mm 5 μm
Mobile phase	60% 0.3% H ₃ PO ₄ 40% acetonitrile
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 237 nm



High separation efficiency and symmetrical peak shapes. The tailing factor for salicylic acid is 0.96.

Water soluble vitamins

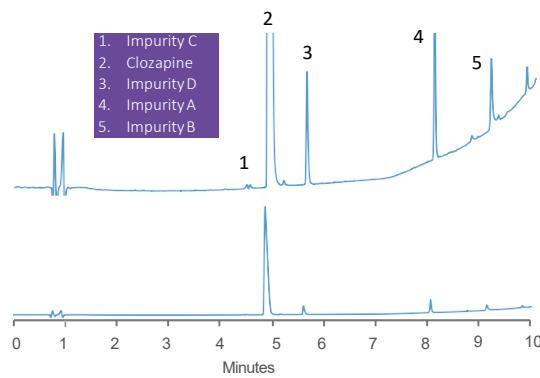
Column	SVEA® C18 Gold 150x4.6 mm 5 µm
Mobile phase	A 25 mM KH ₂ PO ₄ pH 3.6; B acetonitrile
Gradient	5-30% B in 8 min
Flow rate	1.5 ml/min
Temperature	25°C



Sharp peaks and selectivities of vitamins.

Clozapine and related impurities

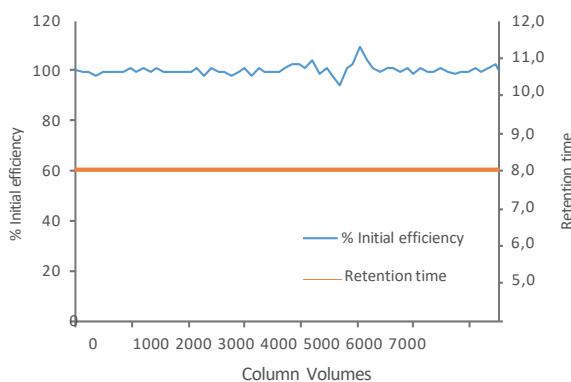
Column	SVEA® C18 Gold 100x4.6 mm 3.5 µm
Mobile phase	A 0.1% TFA in H ₂ O; B 0.1% TFA in acetonitrile
Gradient	10-30% B in 4 min, 30-95% B in 4 min, 95% B in 2 min
Flow rate	1.5 ml/min
Temperature	25°C
Detection	UV 257 nm



The high efficiency of SVEA® C18 Gold 3.5 µm gives an extraordinary resolution profile over the forced degradation sample of Clozapine.

Low pH stability at high temperature

Column	SVEA® C18 Gold 150x4.6 mm 5 µm
Mobile phase	A 1% TFA in H ₂ O pH 0.9; B 1 % TFA in acetonitrile
Gradient	10-90% B in 5 min, 90% B in 2 min, 90-10% B in 1 min, 10% B in 2 min
Flow rate	1.0 ml/min
Temperature	60°C
Detection	UV 254 nm



No change in either efficiency or retention time for ethylbenzene after running gradient cycles at pH 0.9 and 60°C for more than 7000 column volumes.

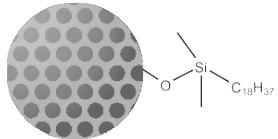
Order information SVEA® C18 Gold columns

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number
1.7 µm	2.1	20 mm	110 Å	A112V1
		30 mm	110 Å	A122V1
		50 mm	110 Å	A132V1
		100 mm	110 Å	A152V1
		150 mm	110 Å	A162V1
3.5 µm	2.1	50 mm	110 Å	A332V1
		100 mm	110 Å	A352V1
		150 mm	110 Å	A362V1
	3	50 mm	110 Å	A333V1
		100 mm	110 Å	A353V1
		150 mm	110 Å	A363V1
		250 mm	110 Å	A383V1
	4.6	50 mm	110 Å	A335V1
		100 mm	110 Å	A355V1
		150 mm	110 Å	A365V1
		250 mm	110 Å	A385V1
5 µm	3	50 mm	110 Å	A533V1
		100 mm	110 Å	A553V1
		150 mm	110 Å	A563V1
		250 mm	110 Å	A583V1
	4.6	50 mm	110 Å	A535V1
		100 mm	110 Å	A555V1
		150 mm	110 Å	A565V1
		250 mm	110 Å	A585V1
	10	150 mm	110 Å	A561V9
		250 mm	110 Å	A581V9
	21.2	50 mm	110 Å	A539V9
		100 mm	110 Å	A559V9
		150 mm	110 Å	A569V9
		250 mm	110 Å	A589V9
	30	50 mm	110 Å	A537V9
		100 mm	110 Å	A557V9
		150 mm	110 Å	A567V9
		250 mm	110 Å	A587V9
	50	50 mm	110 Å	A536V9
		250 mm	110 Å	A586V9

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number	
10 µm	10	150 mm	110 Å	A761V9	
		250 mm	110 Å	A781V9	
	21.2	50 mm	110 Å	A739V9	
		100 mm	110 Å	A759V9	
		150 mm	110 Å	A769V9	
		250 mm	110 Å	A789V9	
	30	50 mm	110 Å	A737V9	
		100 mm	110 Å	A757V9	
15 µm		150 mm	110 Å	A767V9	
		250 mm	110 Å	A787V9	
50	50 mm	110 Å	A736V9		
	250 mm	110 Å	A786V9		
10	150 mm	110 Å	A961V9		
	250 mm	110 Å	A981V9		
21.2	50 mm	110 Å	A939V9		
	100 mm	110 Å	A959V9		
	150 mm	110 Å	A969V9		
	250 mm	110 Å	A989V9		
30	50 mm	110 Å	A937V9		
	100 mm	110 Å	A957V9		
	150 mm	110 Å	A967V9		
	250 mm	110 Å	A987V9		
50	50 mm	110 Å	A936V9		
	250 mm	110 Å	A986V9		

SVEA® C18 Opal

Silica:	Type B Silica
Particle size:	3.5, 5 µm
Surface area:	300 m ² /g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	14%
Ligand density:	3.7 µmol/m ²
Bonded phase:	Octadecyl silane
End-capping:	Yes
USP code:	L1
pH range:	1-11



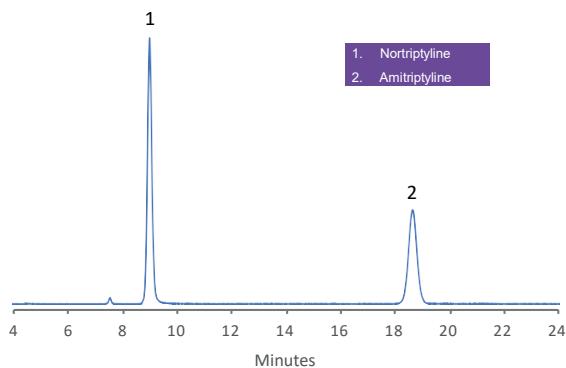
- Recommended for high pH applications
- Proprietary coating ensures solely hydrophobic interaction
- Better peak shape for ionisable compounds
- Low bleeding of ligands

SVEA® C18 Opal is coated with a proprietary bonding technology, which provides a fully covered silica surface. The column material is protected against hydrolysis of the ligands at low pH and silica dissolution at high pH. The coating results in only hydrophobic interactions, resulting in excellent peak shape for all types of analytes.

The proprietary bonding technology binds the ligands strongly, providing exceptionally low bleeding.

Separation of Nortriptyline and Amitriptyline

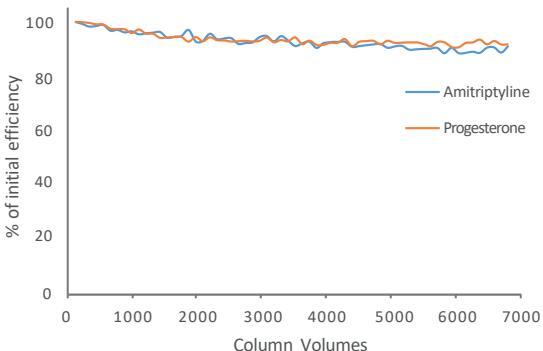
Column	SVEA® C18 Opal 250x4.6 mm 5µm
Mobile phase	20% 25 mM KH ₂ PO ₄ pH 7.0 80% methanol
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 210 nm



Highly efficient and symmetrical peak shapes for Nortriptyline and Amitriptyline. Tailing factor for Nortriptyline is 1.08, and for Amitriptyline 1.02.

High pH stability at high temperature

Column	SVEA® C18 Opal 250x4.6 mm 5µm
Mobile phase	A 10 mM NH ₄ HCO ₃ pH 10.5; B acetonitrile
Gradient	10-50% B in 60 min
Gradient cycle	10-90% B in 13 min, 90% B in 5 min, 90-10% B in 2 min, 10% B in 5 min
Flow rate	1 ml/min
Temperature	60°C
Detection	UV 210 nm

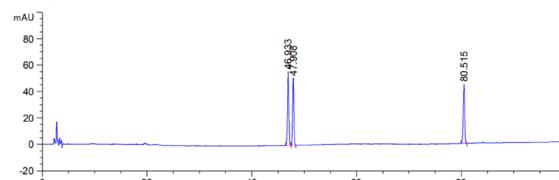


The efficiencies of the neutral (Progesterone) and basic (Amitriptyline) compounds are almost unaffected using gradient cycles after more than 7000 column volumes.

Ginsenoside

Column	SVEA® C18 Opal 250x4.6 mm 5 µm
Mobile phase	Gradient in table
Flow rate	1.0 ml/min
Injection volume	10 µl
Sample concentration	2 mg/ml
Temperature	30°C
Detection	DAD 203 nm

Time (min)	A% Acetonitrile	B% Water
0	5	95
20	15	85
30	45	55
31	5	95
35	5	95



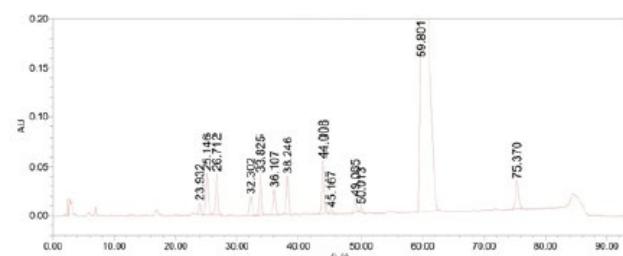
peak	analytes	Peak area	Resolution	Selectivity
1	Rg1	1024	-	
2	Re	840	2.16	1.02
3	Rb1	886	68.35	1.68

The SVEA® C18 Opal column was used to separate ginsenoside. Also the difficult separation of Rg1 and Re was successful using SVEA® C18 Opal.

Azithromycin

Column	SVEA® C18 Opal 250x4.6 mm 5 µm
Mobile phase	Gradient in table
Flow rate	1.0 ml/min
Injection volume	50 µl
Sample concentration	8 mg/ml
Temperature	60°C
Detection	UV 210 nm
Sample	Azithromycin including impurities

Time (min)	Mobile-phase A 1.8µL anhydrous sodium hydrogen phosphate is adjusted to pH 8.5 with dilute phosphoric acid or dilute sodium hydroxide	Mobile-phase B methanol: acetonitrile (250:750 V/V)
0-25	50-45	50-55
25-30	45-40	55-60
30-60	40-25	60-75
60-81	25-50	75-50
81-93	50	50



Peak order from left to right: M, Q, R, F, J, I, S, H, unknown, A, unknown, azithromycin, B

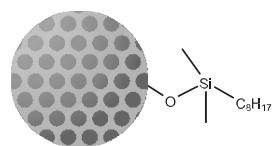
Method: EU Pharmacopoeia 9.0, Azithromycin monograph. Data kindly provided by Yunbo Technologies.

Order information SVEA® C18 Opal columns

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number
3.5 µm	2.1	50 mm	110 Å	A332V3
		100 mm	110 Å	A352V3
		150 mm	110 Å	A362V3
	3	50 mm	110 Å	A333V3
		100 mm	110 Å	A353V3
		150 mm	110 Å	A363V3
		250 mm	110 Å	A383V3
	4.6	50 mm	110 Å	A335V3
		100 mm	110 Å	A355V3
		150 mm	110 Å	A365V3
		250 mm	110 Å	A385V3
		50 mm	110 Å	A533V3
5 µm	3	100 mm	110 Å	A553V3
		150 mm	110 Å	A563V3
		250 mm	110 Å	A583V3
		50 mm	110 Å	A535V3
	4.6	100 mm	110 Å	A555V3
		150 mm	110 Å	A565V3
		250 mm	110 Å	A585V3

SVEA® C8

Silica:	Type B Silica
Particle size:	3.5, 5 µm
Surface area:	300 m ² /g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	11%
Ligand density:	3.7 µmol/m ²
Bonded phase:	Dimethyloctylsilane
End-capping:	Yes
USP code:	L7
pH range:	1-9

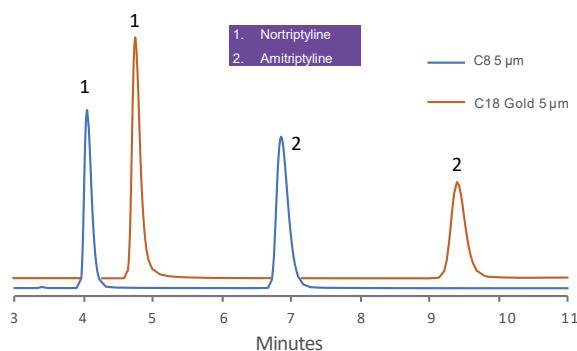


- Similar selectivity for lipophilic compounds as C18 Gold
- Lower retention than C18 Gold
- Slightly different selectivity for ionized acids and bases compared to SVEA® C18 Gold
- Excellent peak shape for acids and bases

An alternative media to SVEA® C18 Gold that gives lower retention. Due to the more hydrophilic nature of the bonded phase, ionized acids and especially bases can have better peak shapes and different selectivity compared to SVEA® C18 Gold. Recommended for mixture containing moderately polar and very hydrophobic compounds.

Comparison of peak shapes and retention times between C8 and C18 Gold for two anti-depressants

Column	SVEA® C18 Opal 150x4.6 mm 5 µm and C18 Gold 5 µm
Mobile phase	20% 25 mM KH ₂ PO ₄ pH 7.0 80% methanol
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 210 nm

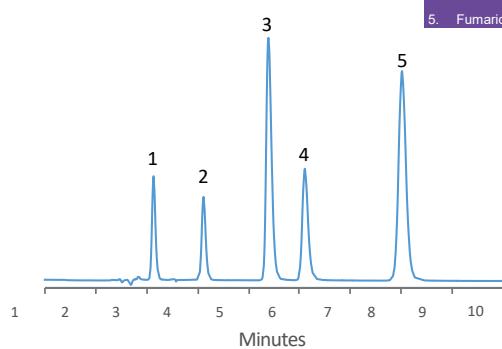


The excellent peak shapes for ionized compounds with SVEA® C8 is revealed by analysing anti-depressants.

Water soluble organic acids

Column	SVEA® C8 250x4.6 mm 5 µm
Mobile phase	97% 25 mM KH ₂ PO ₄ pH 2.5 3% methanol
Flow rate	1 ml/min
Temperature	25°C
Detection	UV 220 nm

1. Tartaricacid
2. Malicacid
3. Lacticacid
4. Maleicacid
5. Fumaricacid

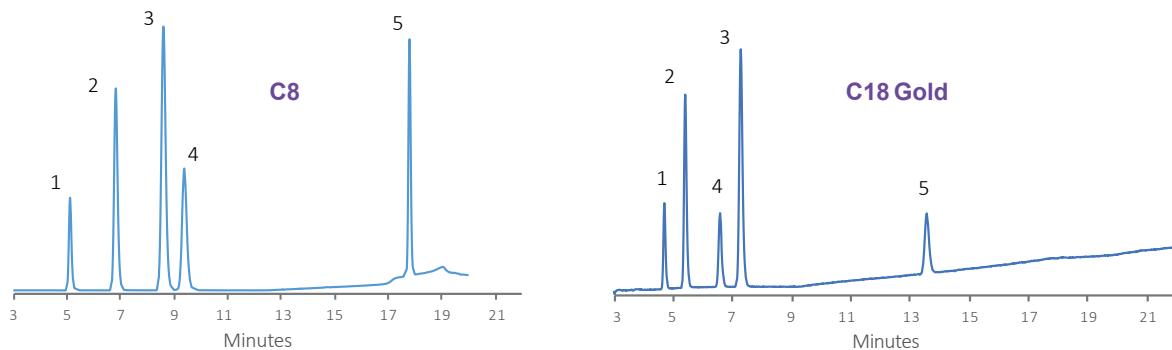


Excellent peak shapes and selectivities of water soluble organic acids are obtained at highly hydrophilic elution conditions.

Comparison of the elution order of phenols between C8 and C18 Gold bonded silica

Column SVEA® C8 150x4.6 mm 5 µm and C18 Gold 250x4.6 5 µm
Mobile phase A 1% AcOH in H₂O, B 1% AcOH in methanol
Gradient C8: 45% B in 10 min, 45-90% B in 10 min
 C18 Gold: 60% B in 10 min, 60-80% B in 10 min
Flow rate 1 ml/min
Temperature 30°C
Detection UV 280 nm

- 1. Phenol
- 2. 4-Nitrophenol
- 3. 2-Nitrophenol
- 4. 2-Chlorophenol
- 5. 2,4-Dichlorophenol

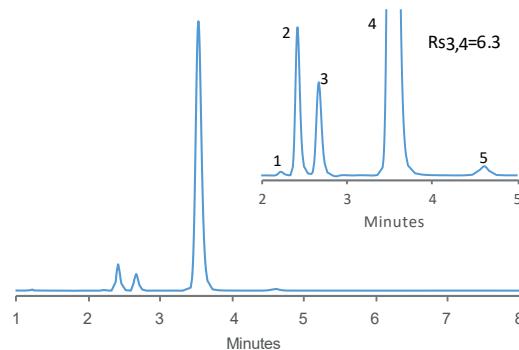


C8 is more hydrophilic than C18 Gold as seen by the reversal of the elution order of 2-nitrophenol and 2-chlorophenol.

Clozapine system suitability test

Column SVEA® C8 150x4.6 mm 5 µm
Mobile phase 20% 0.38% Et₃N in H₂O 80% methanol
Flow rate 1 ml/min
Temperature 30°C
Detection UV 257 nm

- 1. Impurity C
- 2. Impurity D
- 3. Impurity A
- 4. Clozapine
- 5. Unknown

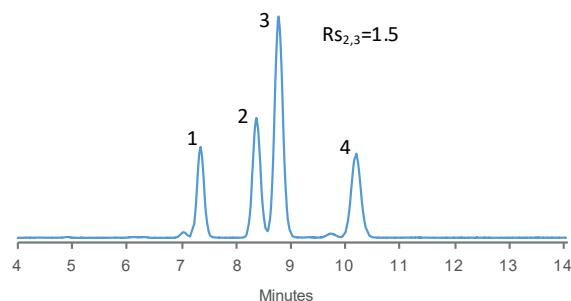


Sharp peaks and resolution.

Atorvastatin (Lipitor) system suitability test

Column SVEA® C8 100x4.6 mm 3.5 µm
Mobile phase 58% 50 mM NH₄OAc pH 4.6 30% acetonitrile, 12% THF
Flow rate 1.2 ml/min
Temperature 30°C
Detection UV 244 nm

- 1. Impurity A
- 2. Impurity B
- 3. Atorvastatin
- 4. Impurity C



Atorvastatin and its diastereomeric Impurity B are separated well using SVEA® C8 3.5 µm.

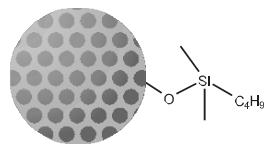
Order information SVEA® C8 columns

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number
3.5 µm	2.1	50 mm	110 Å	B332V1
		100 mm	110 Å	B352V1
		150 mm	110 Å	B362V1
	3	50 mm	110 Å	B333V1
		100 mm	110 Å	B353V1
		150 mm	110 Å	B363V1
		250 mm	110 Å	B383V1
	4.6	50 mm	110 Å	B335V1
		100 mm	110 Å	B355V1
		150 mm	110 Å	B365V1
		250 mm	110 Å	B385V1
5 µm	3	50 mm	110 Å	B533V1
		100 mm	110 Å	B553V1
		150 mm	110 Å	B563V1
		250 mm	110 Å	B583V1
	4.6	50 mm	110 Å	B535V1
		100 mm	110 Å	B555V1
		150 mm	110 Å	B565V1
		250 mm	110 Å	B585V1
	10	150 mm	110 Å	B561V9
		250 mm	110 Å	B581V9
	21.2	50 mm	110 Å	B539V9
		100 mm	110 Å	B559V9
		150 mm	110 Å	B569V9
		250 mm	110 Å	B589V9
	30	50 mm	110 Å	B537V9
		100 mm	110 Å	B557V9
		150 mm	110 Å	B567V9
		250 mm	110 Å	B587V9
	50	50 mm	110 Å	B536V9
		250 mm	110 Å	B586V9

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number
10 µm	10	150 mm	110 Å	B761V9
		250 mm	110 Å	B781V9
	21.2	50 mm	110 Å	B739V9
		100 mm	110 Å	B759V9
		150 mm	110 Å	B769V9
		250 mm	110 Å	B789V9
	30	50 mm	110 Å	B737V9
		100 mm	110 Å	B757V9
		150 mm	110 Å	B767V9
		250 mm	110 Å	B787V9
	50	50 mm	110 Å	B736V9
		250 mm	110 Å	B786V9
15 µm	10	150 mm	110 Å	B961V9
		250 mm	110 Å	B981V9
	21.2	50 mm	110 Å	B939V9
		100 mm	110 Å	B959V9
		150 mm	110 Å	B969V9
		250 mm	110 Å	B989V9
	30	50 mm	110 Å	B937V9
		100 mm	110 Å	B957V9
		150 mm	110 Å	B967V9
		250 mm	110 Å	B987V9
	50	50 mm	110 Å	B936V9
		250 mm	110 Å	B986V9

SVEA® C4

Silica:	Type B Silica
Particle size:	3.5, 5 μm
Surface area:	300 m^2/g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	7%
Ligand density:	3.7 $\mu\text{mol}/\text{m}^2$
Bonded phase:	Dimethylbutylsilane
End-capping:	Yes
USP code:	L26
pH range:	1-8

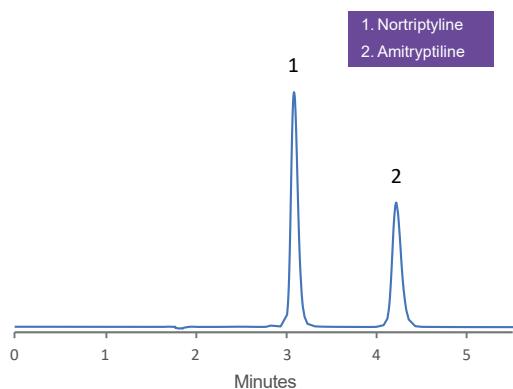


- Recommended for separation of large peptides and proteins
- Very low retention for lipophilic compounds
- Can also be run in HILIC-mode

Recommended for extremely lipophilic compounds to reduce analytical time. Excellent starting point for analyzing peptide and protein mixtures. For intermediately polar analytes, such as amino acids, SVEA® C4 can also be run in HILIC-mode.

Separation of Nortriptyline and Amitriptyline

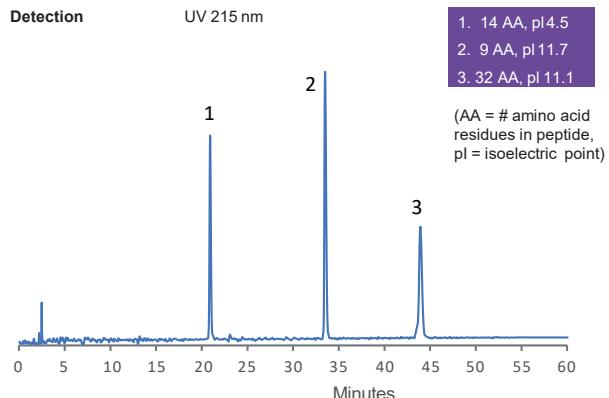
Column	SVEA® C4 150x4.6 mm 5 μm
Mobile phase	20% 25 mM KH ₂ PO ₄ , pH 7.0 80% methanol
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 210 nm



Short retention times and symmetrical peaks of the basic anti-depressants obtained on SVEA® C4.

Peptide mix separation

Column	SVEA® C4 150x4.6 mm 5 μm
Mobile phase	A 0.1% TFA in H ₂ O, B 0.085% TFA in acetonitrile
Gradient	10-50% B in 60 min
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 215 nm



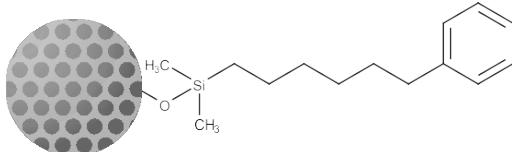
Separation of three different peptides on SVEA® C4.

Order information SVEA® C4 columns

<i>Particle Size</i>	<i>Column ID (mm)</i>	<i>Column Length</i>	<i>Pore Size</i>	<i>Article Number</i>
3.5 µm	2.1	50 mm	110 Å	C332V1
		100 mm	110 Å	C352V1
		150 mm	110 Å	C362V1
	3	50 mm	110 Å	C333V1
		100 mm	110 Å	C353V1
		150 mm	110 Å	C363V1
		250 mm	110 Å	C383V1
	4.6	50 mm	110 Å	C335V1
		100 mm	110 Å	C355V1
		150 mm	110 Å	C365V1
		250 mm	110 Å	C385V1
5 µm	3	50 mm	110 Å	C533V1
		100 mm	110 Å	C553V1
		150 mm	110 Å	C563V1
		250 mm	110 Å	C583V1
	4.6	50 mm	110 Å	C535V1
		100 mm	110 Å	C555V1
		150 mm	110 Å	C565V1
		250 mm	110 Å	C585V1

SVEA® Phenyl-Hexyl

Silica:	Type B Silica
Particle size:	3.5, 5 µm
Surface area:	300 m ² /g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	16%
Ligand density:	3.8 µmol/m ²
Bonded phase:	Dimethylphenylhexylsilane
End-capping:	Yes
USP code:	L11
pH range:	2-8



- Orthogonal chemistry for method development
- Can be used in aqueous conditions
- Recommended for separation of aromatics and/or polar analytes

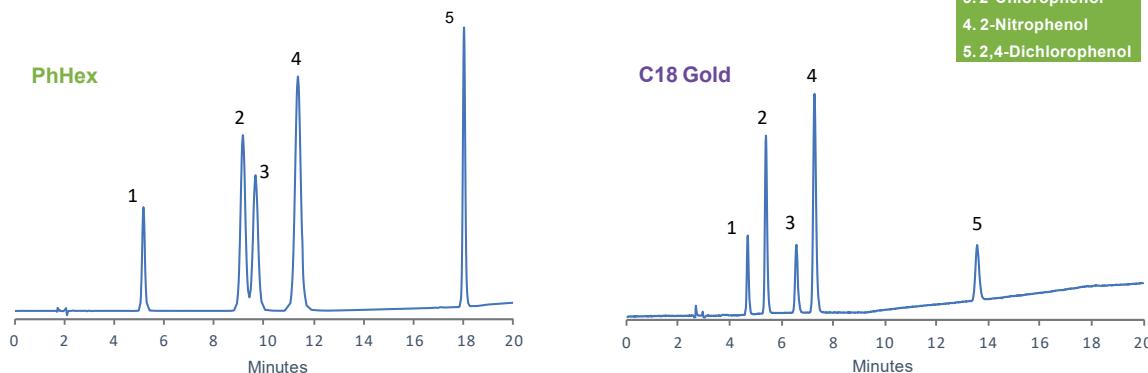
The aromatic ring and the alkyl chain will give a mixed interaction; π-π and hydrophobic interaction, respectively. Good choice as an orthogonal column compared to SVEA® C18/C8 in method development, where the traditional alkyl-based stationary phases fail to provide adequate separation.

This media can be used in highly aqueous conditions (100 % wettability), especially for very polar compounds.

Analyses of various phenols on Phenyl Hexyl and C18 Gold bonded silica

Column	SVEA® PhHex 150x4.6 mm 5 µm and SVEA® C18 Gold 250x4.6 mm 5 µm
Mobile phase	A 1% AcOH in H ₂ O, B 1% AcOH in methanol
Gradients	PhHex: 45% B in 60 min, 45-90% B in 10 min C18: 60% B in 6 min, 60-80% B in 14 min
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 280 nm

- 1. Phenol
- 2. 4-Nitrophenol
- 3. 2-Chlorophenol
- 4. 2-Nitrophenol
- 5. 2,4-Dichlorophenol

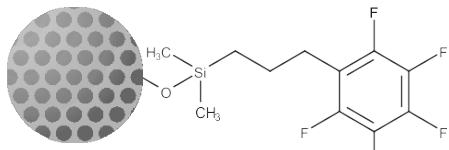


Selectivity difference between Phenyl-Hexyl and C18 Gold for separation of phenols.

Order information SVEA® Phenyl-Hexyl columns

<i>Particle Size</i>	<i>Column ID (mm)</i>	<i>Column Length</i>	<i>Pore Size</i>	<i>Article Number</i>
3.5 µm	2.1	50 mm	110 Å	F332V1
		100 mm	110 Å	F352V1
		150 mm	110 Å	F362V1
	3	50 mm	110 Å	F333V1
		100 mm	110 Å	F353V1
		150 mm	110 Å	F363V1
		250 mm	110 Å	F383V1
	4.6	50 mm	110 Å	F335V1
		100 mm	110 Å	F355V1
		150 mm	110 Å	F365V1
		250 mm	110 Å	F385V1
5 µm	3	50 mm	110 Å	F533V1
		100 mm	110 Å	F553V1
		150 mm	110 Å	F563V1
		250 mm	110 Å	F583V1
	4.6	50 mm	110 Å	F535V1
		100 mm	110 Å	F555V1
		150 mm	110 Å	F565V1
		250 mm	110 Å	F585V1

Silica:	Type B Silica
Particle size:	3.5, 5 µm
Surface area:	300 m ² /g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	11%
Ligand density:	1.9 µmol/m ²
Bonded phase:	Dimethylpentafluorophenylpropylsilane
End-capping:	Yes
USP code:	L43
pH range:	2-8



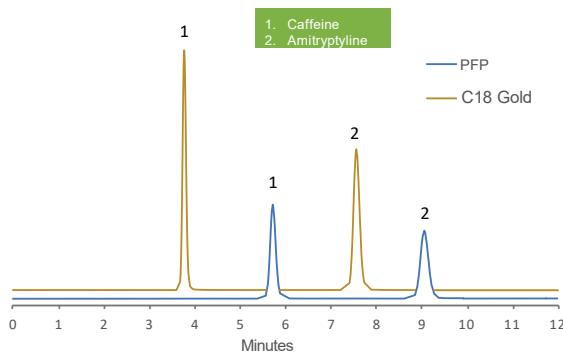
- Strong retention of protic compounds and analytes with high dipole moments
- Strong π-interaction with electron deficient aromatic rings
- Recommended for very polar compounds

Due to the highly electron rich nature of the aromatic rings of SVEA® PFP, the stationary phase interacts strongly with analytes containing polar aprotic and electron deficient aromatic moieties. Additionally, the highly electronegative surface of the aromatic ring provides strong hydrogen bonding with analytes with protic moieties, such as hydroxyl groups and carboxylic acids. The delocalized charge over the fluorine-carbon bond will interact with analytes containing dipole moments.

The polar nature of SVEA® PFP ensures a fully wettable stationary phase, making it suitable for analysing very polar compounds.

Comparison between PFP and C18 Gold bonded phases

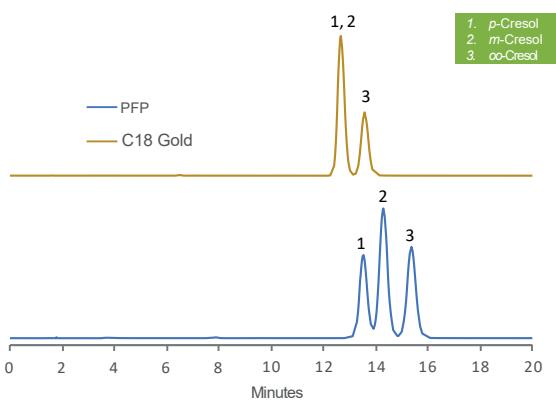
Column	SVEA® PFP 150x4.6 mm 5 µm and SVEA® C18 Gold 5 µm
Mobile phase	70% H ₂ O 30% methanol
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 210 nm



Strong hydrogen bonding of the PFP column: the hydrogen bonding acceptor, caffeine, and the donor, phenol, has much higher retention than for the C18 Gold.

Comparison between PFP and C18 Gold bonded phases

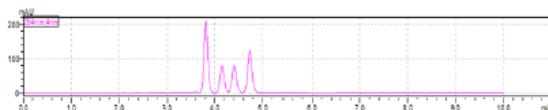
Column	SVEA® PFP 150x4.6 mm 5 µm and SVEA® C18 Gold 5 µm
Mobile phase	60% H ₂ O 40% methanol
Flow rate	1 ml/min
Temperature	20°C
Detection	UV 210 nm



The SVEA® PFP successfully separates three cresol isomers, compared to C18 Gold.

Tocopherols in vitamin E

Column SVEA® PFP 150x2.1 mm 3.5 µm
Mobile phase 95% methanol 5% H₂O
Flow rate 0.25 ml/min
Detection SPD-M30A UV 294 nm



Peaks	Retention time	Resolution (USP)	Tailing	Tailing (10%)
1	3.809	--	1.134	1.118
2	4.147	2.143	1.142	1.107
3	4.406	1.535	1.055	1.079
4	4.729	1.832	1.092	1.082

Peak order: 1 Delta tocopherol, 2 Beta tocopherol, 3 Gamma tocopherol, 4 Alfa tocopherol

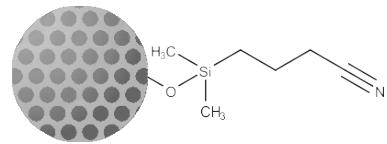
The SVEA® PFP 3.5µm 2.1x150 mm column managed to perform the difficult separation of alfa, beta, gamma and delta components of vitamin E.

Order information SVEA® PFP columns

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number
3.5 µm	2.1	50 mm	110 Å	P332V1
		100 mm	110 Å	P352V1
		150 mm	110 Å	P362V1
	3	50 mm	110 Å	P333V1
		100 mm	110 Å	P353V1
		150 mm	110 Å	P363V1
		250 mm	110 Å	P383V1
	4.6	50 mm	110 Å	P335V1
		100 mm	110 Å	P355V1
		150 mm	110 Å	P365V1
		250 mm	110 Å	P385V1
5 µm	3	50 mm	110 Å	P533V1
		100 mm	110 Å	P553V1
		150 mm	110 Å	P563V1
		250 mm	110 Å	P583V1
	4.6	50 mm	110 Å	P535V1
		100 mm	110 Å	P555V1
		150 mm	110 Å	P565V1
		250 mm	110 Å	P585V1

SVEA® Cyano

Silica:	Type B Silica
Particle size:	3.5, 5 µm
Surface area:	300 m ² /g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	7%
Ligand density:	3.7 µmol/m ²
Bonded phase:	3-Cyanopropyltrimethylsilane
End-capping:	Yes
USP code:	L10
pH range:	2-7.5



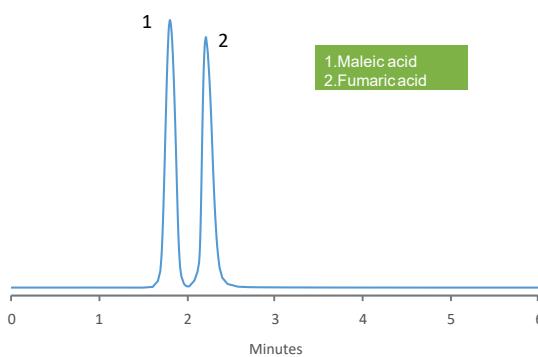
- Very polar stationary phase
- Strong dipole-dipole interactions
- Orthogonal phase in RPLC method development
- Recommended for HILIC and Normal Phase

Recommended for analytes having too high retention on an alkyl-based stationary phase, as well as mixtures of very polar and lipophilic analytes. The nitrile group of the stationary phase interacts favourably with analytes containing double and/or triple bonds, making SVEA® Cyano suitable for unsaturated compounds.

Due to its very polar nature, SVEA® Cyano can be used in both HILIC-mode as well as in normal phase chromatography. Please refer to the care and use instructions for additional information.

Separation of two isomeric polar organic acids

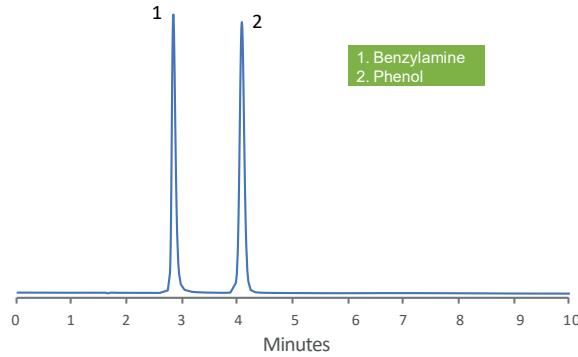
Column	SVEA® CN 150x4.6 mm 5 µm
Mobile phase	97% 20 mM NH ₄ OAc pH 3.9 3% methanol
Flow rate	1 ml/min
Temperature	40°C
Detection	UV 210 nm



Very short analytical time and base line separation between the two watersoluble cis-/trans-isomeric acids.

Benzylamine analysed on Cyano bonded silica

Column	SVEA® CN 150x4.6 mm 5 µm
Mobile phase	70% 20 mM KH ₂ PO ₄ , pH 7.6 30% methanol
Flow rate	1 ml/min
Temperature	30°C
Detection	UV 210 nm



Sharp and symmetrical peaks of basic and highly polar benzylamine.

Order information SVEA® Cyano columns

<i>Particle Size</i>	<i>Column ID (mm)</i>	<i>Column Length</i>	<i>Pore Size</i>	<i>Article Number</i>
3.5 µm	2.1	50 mm	110 Å	Y332V1
		100 mm	110 Å	Y352V1
		150 mm	110 Å	Y362V1
	3	50 mm	110 Å	Y333V1
		100 mm	110 Å	Y353V1
		150 mm	110 Å	Y363V1
		250 mm	110 Å	Y383V1
	4.6	50 mm	110 Å	Y335V1
		100 mm	110 Å	Y355V1
		150 mm	110 Å	Y365V1
		250 mm	110 Å	Y385V1
5 µm	3	50 mm	110 Å	Y533V1
		100 mm	110 Å	Y553V1
		150 mm	110 Å	Y563V1
		250 mm	110 Å	Y583V1
	4.6	50 mm	110 Å	Y535V1
		100 mm	110 Å	Y555V1
		150 mm	110 Å	Y565V1
		250 mm	110 Å	Y585V1

SVEA® Silica

Silica:	Type B Silica
Particle size:	3.5, 5 μm
Surface area:	300 m^2/g
Pore size:	110 Å
Pore volume:	0.85 ml/g
Carbon load:	-
Ligand density:	-
Bonded phase:	-
End-capping:	-
USP code:	L3
pH range:	2-8



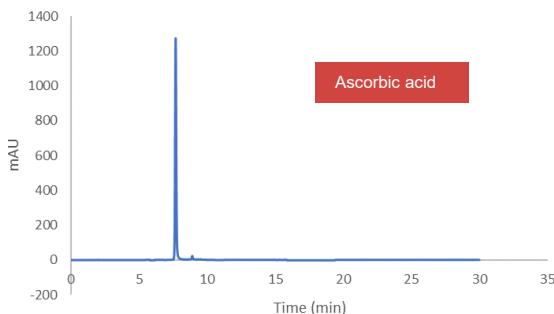
SVEA® Silica is a bare silica column designed for normal phase chromatography. The mechanisms of actions are partitioning of the analytes between an almost stagnant water layer close to the silica surface and the mobile phase; polar interactions and hydrogen bonding etc.

- HILIC and Normal Phase
- Excellent peak shapes for acidic, neutral and basic compounds
- Recommended for non-polar and moderately polar organic compounds

The column is recommended for separation of non-polar and moderately polar organic compounds by normal phase chromatography, and gives excellent peak shapes for acidic, neutral and basic compounds.

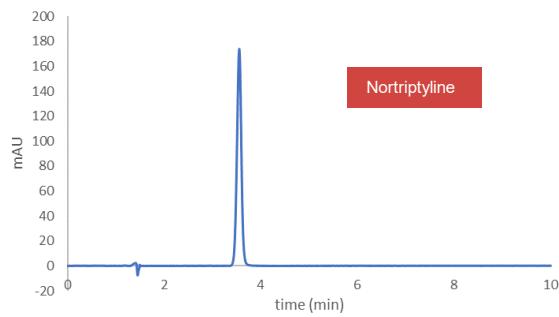
Ascorbic acid (high water solubility)

Column	SVEA® Silica 100x30 mm 5 μm
Mobile phase	A: ACN/20mM ammonium acetate 50/50 B: ACN/100mM ammonium acetate 90/10
Gradient	0-2 min 100%; 2-10 min 0%; 10-12 min 0%, 12.5-30 min 100%
Flow rate	0.43 ml/min
Temperature	30°C
Detection	UV 254 nm



Nortriptyline (basic molecule)

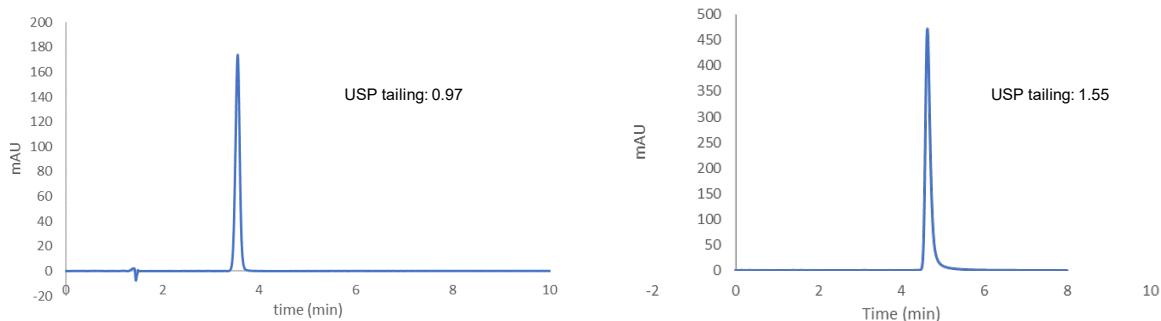
Column	SVEA® Silica 100x30 mm 5 μm
Mobile phase	70/30 ACN/20 mM ammonium acetate
Flow rate	0.43 ml/min
Temperature	30°C
Detection	UV 230 nm



USP tailing for Nortriptyline: 0.97
This shows homogeneous distribution of the silanol groups over the surface.

Comparison of Nortriptyline chromatograms run with unbonded silica and C18 Gold

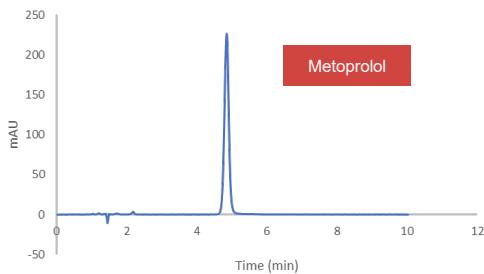
Column	SVEA® Silica 100x30 mm 5 µm	SVEA® C18 Gold 150x4.6 mm 5 µm
Mobile phase	70/30 ACN/20 mM ammonium acetate pH 6.8	80/20 MeOH/ 25 mM potassium phosphate pH 7.0
Flow rate	0.43 ml/min	1.0 ml/min
Temperature	30°C	30°C
Detection	UV 230 nm	UV 210 nm



This example illustrates analytical runs with a basic molecule which were performed on C18 Gold and unbonded silica SVEA® columns. In both cases pH of the buffer was neutral. Under these conditions, nortriptyline was protonated, and the silica surface was deprotonated. Such conditions would for the C18 covered surface cause secondary interactions between residual silanol groups and the base and one would observe peak tailing. For the unbonded silica, non-even distribution and activity of silanol groups would cause secondary interactions and result in a peak tailing. For both of the phases of the SVEA® columns, the peak tailing is very low, verifying the homogeneous surface coverage.

Metoprolol (basic molecule)

Column	SVEA® Silica 100x30 mm 5 µm
Mobile phase	70/30 ACN/20 mM ammonium acetate
Flow rate	0.43 ml/min
Temperature	30°C
Detection	UV 230 nm



USP tailing for Metoprolol: 0.997
Homogenous distribution of silanol groups on the surface.

Order information SVEA® Silica columns

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number
3.5 µm	2.1	25 mm	110 Å	S312V1
		50 mm	110 Å	S332V1
		100 mm	110 Å	S352V1
		150 mm	110 Å	S362V1
	3	25 mm	110 Å	S313V1
		50 mm	110 Å	S333V1
		100 mm	110 Å	S353V1
		150 mm	110 Å	S363V1
		250 mm	110 Å	S383V1
	4.6	25 mm	110 Å	S315V1
		50 mm	110 Å	S335V1
		100 mm	110 Å	S355V1
		150 mm	110 Å	S365V1
		250 mm	110 Å	S385V1
5 µm	3	25 mm	110 Å	S513V1
		50 mm	110 Å	S533V1
		100 mm	110 Å	S553V1
		150 mm	110 Å	S563V1
		250 mm	110 Å	S583V1
	4.6	25 mm	110 Å	S515V1
		50 mm	110 Å	S535V1
		100 mm	110 Å	S555V1
		150 mm	110 Å	S565V1
		250 mm	110 Å	S585V1
	10	150 mm	110 Å	S561V9
		250 mm	110 Å	S581V9
	21.2	50 mm	110 Å	S539V9
		100 mm	110 Å	S559V9
		150 mm	110 Å	S569V9
		250 mm	110 Å	S589V9
	30	50 mm	110 Å	S537V9
		100 mm	110 Å	S557V9
		150 mm	110 Å	S567V9
		250 mm	110 Å	S587V9
	50	50 mm	110 Å	S536V9
		250 mm	110 Å	S586V9

Particle Size	Column ID (mm)	Column Length	Pore Size	Article Number
10 µm	10	150 mm	110 Å	S761V9
		250 mm	110 Å	S781V9
	21.2	50 mm	110 Å	S739V9
		100 mm	110 Å	S759V9
	30	150 mm	110 Å	S769V9
		250 mm	110 Å	S789V9
	50	50 mm	110 Å	S737V9
		100 mm	110 Å	S757V9
15 µm	10	150 mm	110 Å	S961V9
		250 mm	110 Å	S981V9
	21.2	50 mm	110 Å	S939V9
		100 mm	110 Å	S959V9
		150 mm	110 Å	S969V9
		250 mm	110 Å	S989V9
	30	50 mm	110 Å	S937V9
		100 mm	110 Å	S957V9
		150 mm	110 Å	S967V9
		250 mm	110 Å	S987V9
	50	50 mm	110 Å	S936V9
		250 mm	110 Å	S986V9



Photo credits: Dr. Jan Blid and Kunal Mukhopadhyay; Nanologica Copyright Nanologica

Article numbers SVEA® columns

Bonded Phase	Particle Size	Column ID (mm)	Column Length	Pore size	Article Number
C18 Gold	5 µm	3,0	50 mm	110 Å	A533V1
C18 Gold	5 µm	3,0	100 mm	110 Å	A553V1
C18 Gold	5 µm	3,0	150 mm	110 Å	A563V1
C18 Gold	5 µm	3,0	250 mm	110 Å	A583V1
C18 Gold	5 µm	4,6	50 mm	110 Å	A535V1
C18 Gold	5 µm	4,6	100 mm	110 Å	A555V1
C18 Gold	5 µm	4,6	150 mm	110 Å	A565V1
C18 Gold	5 µm	4,6	250 mm	110 Å	A585V1
C18 Gold	3.5 µm	2,1	50 mm	110 Å	A332V1
C18 Gold	3.5 µm	2,1	100 mm	110 Å	A352V1
C18 Gold	3.5 µm	2,1	150 mm	110 Å	A362V1
C18 Gold	3.5 µm	3,0	50 mm	110 Å	A333V1
C18 Gold	3.5 µm	3,0	100 mm	110 Å	A353V1
C18 Gold	3.5 µm	3,0	150 mm	110 Å	A363V1
C18 Gold	3.5 µm	3,0	250 mm	110 Å	A383V1
C18 Gold	3.5 µm	4,6	50 mm	110 Å	A335V1
C18 Gold	3.5 µm	4,6	100 mm	110 Å	A355V1
C18 Gold	3.5 µm	4,6	150 mm	110 Å	A365V1
C18 Gold	3.5 µm	4,6	250 mm	110 Å	A385V1
C18 Opal	5 µm	3,0	50 mm	110 Å	A533V3
C18 Opal	5 µm	3,0	100 mm	110 Å	A553V3
C18 Opal	5 µm	3,0	150 mm	110 Å	A563V3
C18 Opal	5 µm	3,0	250 mm	110 Å	A583V3
C18 Opal	5 µm	4,6	50 mm	110 Å	A535V3
C18 Opal	5 µm	4,6	100 mm	110 Å	A555V3
C18 Opal	5 µm	4,6	150 mm	110 Å	A565V3
C18 Opal	5 µm	4,6	250 mm	110 Å	A585V3
C18 Opal	3.5 µm	2,1	50 mm	110 Å	A332V3
C18 Opal	3.5 µm	2,1	100 mm	110 Å	A352V3
C18 Opal	3.5 µm	2,1	150 mm	110 Å	A362V3
C18 Opal	3.5 µm	3,0	50 mm	110 Å	A333V3
C18 Opal	3.5 µm	3,0	100 mm	110 Å	A353V3
C18 Opal	3.5 µm	3,0	150 mm	110 Å	A363V3
C18 Opal	3.5 µm	3,0	250 mm	110 Å	A383V3
C18 Opal	3.5 µm	4,6	50 mm	110 Å	A335V3
C18 Opal	3.5 µm	4,6	100 mm	110 Å	A355V3
C18 Opal	3.5 µm	4,6	150 mm	110 Å	A365V3
C18 Opal	3.5 µm	4,6	250 mm	110 Å	A385V3

Bonded Phase	Particle Size	Column ID (mm)	Column Length	Pore size	Article Number
C8	5 µm	3,0	50 mm	110 Å	B533V1
C8	5 µm	3,0	100 mm	110 Å	B553V1
C8	5 µm	3,0	150 mm	110 Å	B563V1
C8	5 µm	3,0	250 mm	110 Å	B583V1
C8	5 µm	4,6	50 mm	110 Å	B535V1
C8	5 µm	4,6	100 mm	110 Å	B555V1
C8	5 µm	4,6	150 mm	110 Å	B565V1
C8	5 µm	4,6	250 mm	110 Å	B585V1
C8	3.5 µm	2,1	50 mm	110 Å	B332V1
C8	3.5 µm	2,1	100 mm	110 Å	B352V1
C8	3.5 µm	2,1	150 mm	110 Å	B362V1
C8	3.5 µm	3,0	50 mm	110 Å	B333V1
C8	3.5 µm	3,0	100 mm	110 Å	B353V1
C8	3.5 µm	3,0	150 mm	110 Å	B363V1
C8	3.5 µm	3,0	250 mm	110 Å	B383V1
C8	3.5 µm	4,6	50 mm	110 Å	B335V1
C8	3.5 µm	4,6	100 mm	110 Å	B355V1
C8	3.5 µm	4,6	150 mm	110 Å	B365V1
C8	3.5 µm	4,6	250 mm	110 Å	B385V1
C4	5 µm	3,0	50 mm	110 Å	C533V1
C4	5 µm	3,0	100 mm	110 Å	C553V1
C4	5 µm	3,0	150 mm	110 Å	C563V1
C4	5 µm	3,0	250 mm	110 Å	C583V1
C4	5 µm	4,6	50 mm	110 Å	C535V1
C4	5 µm	4,6	100 mm	110 Å	C555V1
C4	5 µm	4,6	150 mm	110 Å	C565V1
C4	5 µm	4,6	250 mm	110 Å	C585V1
C4	3.5 µm	2,1	50 mm	110 Å	C332V1
C4	3.5 µm	2,1	100 mm	110 Å	C352V1
C4	3.5 µm	2,1	150 mm	110 Å	C362V1
C4	3.5 µm	3,0	50 mm	110 Å	C333V1
C4	3.5 µm	3,0	100 mm	110 Å	C353V1
C4	3.5 µm	3,0	150 mm	110 Å	C363V1
C4	3.5 µm	3,0	250 mm	110 Å	C383V1
C4	3.5 µm	4,6	50 mm	110 Å	C335V1
C4	3.5 µm	4,6	100 mm	110 Å	C355V1
C4	3.5 µm	4,6	150 mm	110 Å	C365V1
C4	3.5 µm	4,6	250 mm	110 Å	C385V1

Bonded Phase	Particle Size	Column ID (mm)	Column Length	Pore size	Article Number
Silica	5 µm	3,0	25 mm	110 Å	S513V1
Silica	5 µm	3,0	50 mm	110 Å	S533V1
Silica	5 µm	3,0	100 mm	110 Å	S553V1
Silica	5 µm	3,0	150 mm	110 Å	S563V1
Silica	5 µm	3,0	250 mm	110 Å	S583V1
Silica	5 µm	4,6	25 mm	110 Å	S515V1
Silica	5 µm	4,6	50 mm	110 Å	S535V1
Silica	5 µm	4,6	100 mm	110 Å	S555V1
Silica	5 µm	4,6	150 mm	110 Å	S565V1
Silica	5 µm	4,6	250 mm	110 Å	S585V1
Silica	3.5 µm	2,1	25 mm	110 Å	S312V1
Silica	3.5 µm	2,1	50 mm	110 Å	S332V1
Silica	3.5 µm	2,1	100 mm	110 Å	S352V1
Silica	3.5 µm	2,1	150 mm	110 Å	S362V1
Silica	3.5 µm	3,0	25 mm	110 Å	S313V1
Silica	3.5 µm	3,0	50 mm	110 Å	S333V1
Silica	3.5 µm	3,0	100 mm	110 Å	S353V1
Silica	3.5 µm	3,0	150 mm	110 Å	S363V1
Silica	3.5 µm	3,0	250 mm	110 Å	S383V1
Silica	3.5 µm	4,6	25 mm	110 Å	S315V1
Silica	3.5 µm	4,6	50 mm	110 Å	S335V1
Silica	3.5 µm	4,6	100 mm	110 Å	S355V1
Silica	3.5 µm	4,6	150 mm	110 Å	S365V1
Silica	3.5 µm	4,6	250 mm	110 Å	S385V1
Phe Hex	5 µm	3,0	50 mm	110 Å	F533V1
Phe Hex	5 µm	3,0	100 mm	110 Å	F553V1
Phe Hex	5 µm	3,0	150 mm	110 Å	F563V1
Phe Hex	5 µm	3,0	250 mm	110 Å	F583V1
Phe Hex	5 µm	4,6	50 mm	110 Å	F535V1
Phe Hex	5 µm	4,6	100 mm	110 Å	F555V1
Phe Hex	5 µm	4,6	150 mm	110 Å	F565V1
Phe Hex	5 µm	4,6	250 mm	110 Å	F585V1
Phe Hex	3.5 µm	2,1	50 mm	110 Å	F332V1
Phe Hex	3.5 µm	2,1	100 mm	110 Å	F352V1
Phe Hex	3.5 µm	2,1	150 mm	110 Å	F362V1
Phe Hex	3.5 µm	3,0	50 mm	110 Å	F333V1
Phe Hex	3.5 µm	3,0	100 mm	110 Å	F353V1
Phe Hex	3.5 µm	3,0	150 mm	110 Å	F363V1
Phe Hex	3.5 µm	3,0	250 mm	110 Å	F383V1
Phe Hex	3.5 µm	4,6	50 mm	110 Å	F335V1
Phe Hex	3.5 µm	4,6	100 mm	110 Å	F355V1
Phe Hex	3.5 µm	4,6	150 mm	110 Å	F365V1
Phe Hex	3.5 µm	4,6	250 mm	110 Å	F385V1

Phases available on request, minimum quantity 5 columns					
Bonded Phase	Particle Size	Column ID (mm)	Column Length	Pore size	Article Number
PFP	5 µm	3,0	50 mm	110 Å	P533V1
PFP	5 µm	3,0	100 mm	110 Å	P553V1
PFP	5 µm	3,0	150 mm	110 Å	P563V1
PFP	5 µm	3,0	250 mm	110 Å	P583V1
PFP	5 µm	4,6	50 mm	110 Å	P535V1
PFP	5 µm	4,6	100 mm	110 Å	P555V1
PFP	5 µm	4,6	150 mm	110 Å	P565V1
PFP	5 µm	4,6	250 mm	110 Å	P585V1
PFP	3.5 µm	2,1	50 mm	110 Å	P332V1
PFP	3.5 µm	2,1	100 mm	110 Å	P352V1
PFP	3.5 µm	2,1	150 mm	110 Å	P362V1
PFP	3.5 µm	3,0	50 mm	110 Å	P333V1
PFP	3.5 µm	3,0	100 mm	110 Å	P353V1
PFP	3.5 µm	3,0	150 mm	110 Å	P363V1
PFP	3.5 µm	3,0	250 mm	110 Å	P383V1
PFP	3.5 µm	4,6	50 mm	110 Å	P335V1
PFP	3.5 µm	4,6	100 mm	110 Å	P355V1
PFP	3.5 µm	4,6	150 mm	110 Å	P365V1
PFP	3.5 µm	4,6	250 mm	110 Å	P385V1
Cyano	5 µm	3,0	100 mm	110 Å	Y553V1
Cyano	5 µm	3,0	150 mm	110 Å	Y563V1
Cyano	5 µm	3,0	250 mm	110 Å	Y583V1
Cyano	5 µm	4,6	50 mm	110 Å	Y535V1
Cyano	5 µm	4,6	100 mm	110 Å	Y555V1
Cyano	5 µm	4,6	150 mm	110 Å	Y565V1
Cyano	5 µm	4,6	250 mm	110 Å	Y585V1
Cyano	3.5 µm	2,1	50 mm	110 Å	Y332V1
Cyano	3.5 µm	2,1	100 mm	110 Å	Y352V1
Cyano	3.5 µm	2,1	150 mm	110 Å	Y362V1
Cyano	3.5 µm	3,0	50 mm	110 Å	Y333V1
Cyano	3.5 µm	3,0	100 mm	110 Å	Y353V1
Cyano	3.5 µm	3,0	150 mm	110 Å	Y363V1
Cyano	3.5 µm	3,0	250 mm	110 Å	Y383V1
Cyano	3.5 µm	4,6	50 mm	110 Å	Y335V1
Cyano	3.5 µm	4,6	100 mm	110 Å	Y355V1
Cyano	3.5 µm	4,6	150 mm	110 Å	Y365V1
Cyano	3.5 µm	4,6	250 mm	110 Å	Y385V1

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