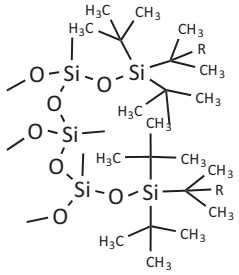
SiliaChrom SB C18 and C8

Description

SiliaChrom SB C18 and **C8** surfaces are treated with an organic form of silicon to increase the number of silanol groups on the surface. After this step, the surface is bonded with a silane containing two functions. One function is a protecting group that shields the area and protects the surface from an acid attack from the mobile phase. The H_3O^+ ion does not have access to the surface to break the O-Si bond (*steric effect*). The other function is the linear hydrophobic chain with 18 or 8 carbons.

Structure



For C18 R = $(CH_2)_{17}CH_3$
For C8 R = $(CH_2)_7CH_3$

SiliaChrom SB C18

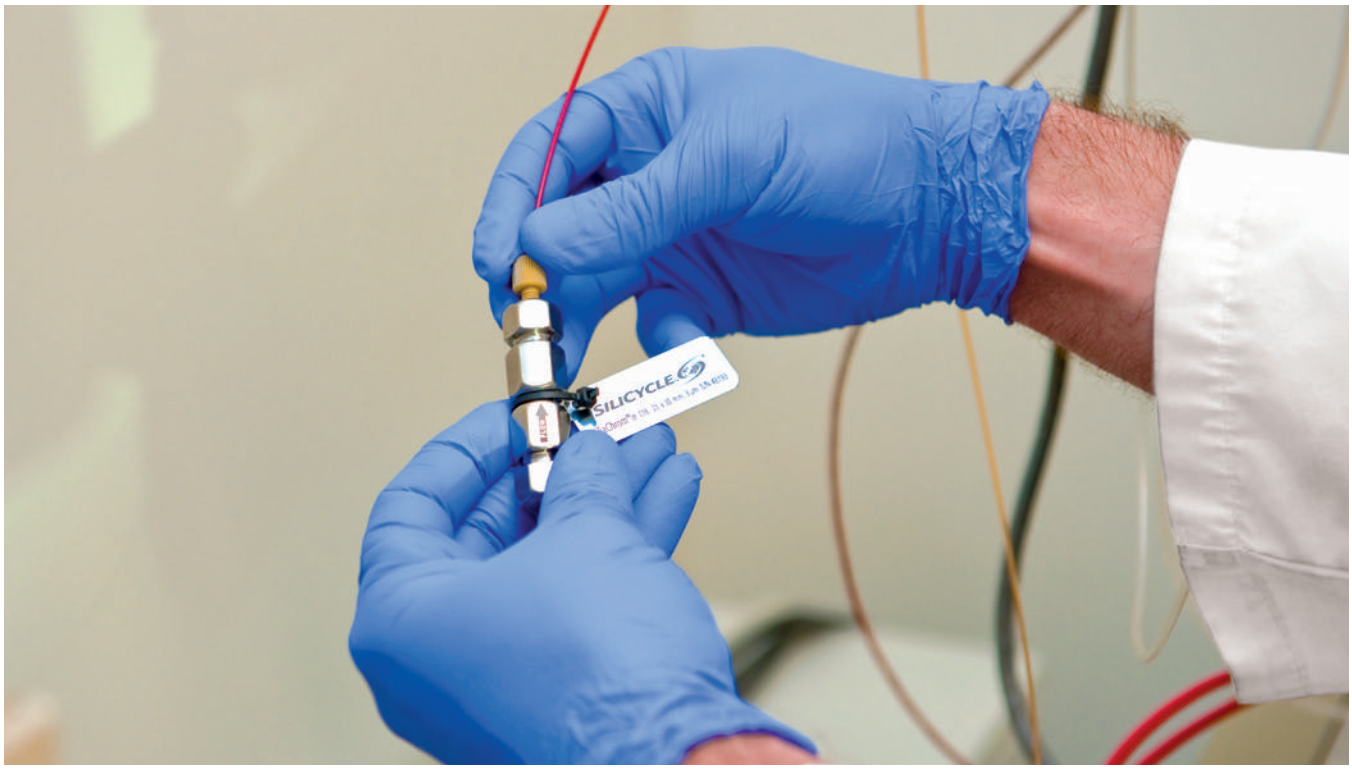
SiliaChrom SB C8

Sorbent Characteristics

- **Pore Size: 100 Å**
- **Specific Surface Area: 200 - 220 m^2/g**
- **Particle Sizes Available: 3, 5 and 10 µm**
- **USP Code: SiliaChrom SB C18: L1**
  SiliaChrom SB C8: L7
- **Typical Carbon Loading: SiliaChrom SB C18: 12%**
  SiliaChrom SB C8: 7%

SiliaChrom SB Main Characteristics

- **Extremely low pH limits (*0.5 - 7.5*)**
- **Extremely low bleeding for LC-MS applications under acidic conditions**
- **Compatible with mobile phases ranging 100% water to 100% organic**
- **Non endcapped**

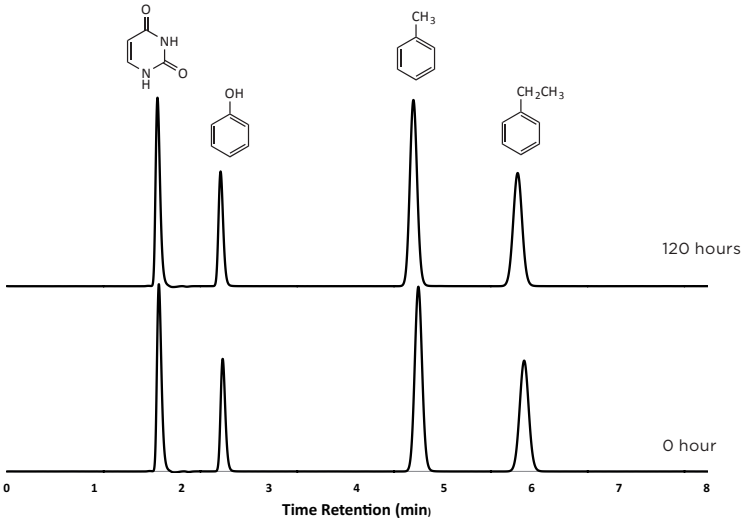


Stability of Silia*Chrom* SB C18 at Low pH Conditions

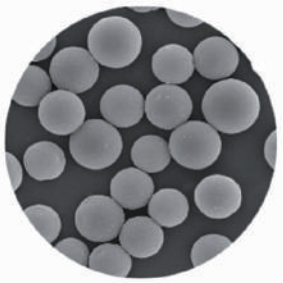
Acidic mobile phases have widespread applications in the reversed phase HPLC separation of many important pharmaceutical and environmental compounds. Analytes such as pharmaceuticals and biomolecules often show peak shape, retention and selectivity changes when the mobile phase pH is changed from neutral to acidic pH (*pH 1.0*). In fact, lowering the pH helps to suppress silanol interactions between basic compounds and the residual surface silanols, thus resulting in less tailing and better retention of acidic compounds (*pKa lower than 2*).

Chromatographic conditions

- **Column**: Silia*Chrom* SB C18, 5 µm
- **Column size**: 4.6 x 150 mm
  SiliCycle P/N: H101805H-N150
- **Mobile phase**: 2% TFA in ACN/water (*60/40*)
  Solution pH: 1.00
- **Temperature**: 23°C
- **Flow rate**: 1.000 mL/min
- **Detector**: UV at 270 nm
- **Injection volume**: 10 µL

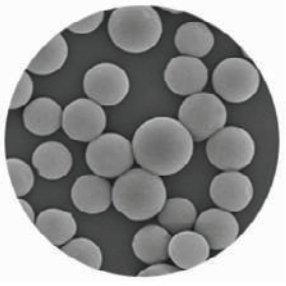


Silia*Chrom* SB C18 (*Ethylbenzene*)			
Time (hour)	RT (min)	TF (USP)	N (USP)
0	5.91	1.01	14,014
24	5.89	1.02	14,085
48	5.77	1.02	14,023
72	5.83	1.02	14,076
96	5.85	1.01	14,087
120	5.84	1.02	14,050
Mean	5.85	1.02	14,056
RSD (%)	**0.84**	**0.51**	**0.23**



Silia*Chrom* SB C18 before

No column degradation under extreme pH conditions



Silia*Chrom* SB C18 after

The HPLC column was used under extreme pH conditions and, even after 5 days of continuous injections, the number of theoretical plates (*N*), the tailing factor (*TF*) and the retention time (*RT*) are comparable. The sorbent kept its chemical and structural integrity, which we have proven with similar chromatograms and scanning electron microscope pictures (*SEM*) before and after 120 hours of use.

In conclusion, our Silia*Chrom* SB C18 and SB C8 columns are stable at low pH conditions.