

INACOM INSTRUMENTS

Issue 6 Q4 2018

Magazine

Great Fluidic Solutions

DEGASi PREP+

The World's First, High Flow Rate
Inline Degasser for Organic Solvents



DEGASi® PREP+ uses a revolutionary new technology that makes it possible to degas organic solutions with higher flows in a cost effective manner.

That means you can get increased capacity at a lower price. DEGASi® PREP+ is a perfect choice for efficient degassing of many types of liquids at high flow rates, up to 75-100 ml / min per chamber.

ERC RI DETECTOR

RefractoMax

The new ERC RI Detector

— RefractoMax — ideal for micro-flow and standard analysis applications.



The RefractoMax Micro is a sensitive refractive index detector suitable for detecting compounds with little or no UV activity such as sugars, lipids or polymers. The instruments are designed for use in analytical HPLC with micro flow rates of 0.1 – 1 ml/min or standard analyses with flow rates of 1-5 ml/min.

Technical Data		
Name:	RefractoMax524 (micro)	RefractoMax521 (analytical)
Flow rate range:	0.1 to 1 ml/min	1 to 5 ml/min
Instrument color:	Gray	Blue
Flow cell volume:	2.5 µL	8 µL
Maximum back pressure:	50 kPa	
Flow cell type:	2 chamber type	
Measuring method:	Deflection type	
Temp. control:	30 to 55 °C (1 °C step)	
Reflective Index range:	1.00–1.75	
Measuring range:	0.25 to 512 µRIU	
Linearity range:	600 µRIU	
Drift:	0.2 µRIU/h	
Noise:	2.5 nRIU (response: 1.5 sec)	
Response:	0.1, 0.25, 0.5, 1, 1.5, 2, 3, 6 sec	
Auto zero:	Full auto zero	
Auto zero range:	All range	
Offset range:	0 to 500 mV (10 mV step)	
Recorder output:	0 to 10 mV/FS	
Integrator output (Sensitivity):	DC 0 to 1 V (2 mV/µRIU, 8 mV/µRIU)	
External output: (1)Ready, (2)Leak, (3) Error (Over Heat / Low Light Intensity / Null Glass Home Position / Lost Parameters / Optical Balance) (contact capacity: DC 24 V 0.1 A max.)		
Communication port:	RS232C	
Wetted materials:	SUS316, Teflon, Quartz glass	
Dimension and weight:	H 150 × W 260 × D 450 (mm), approx. 12 kg	
Power supply:	AC 100 to 240 V +/- 10% 50/60 Hz, 120 VA max.	

We proudly present a Coreshell with **+300 000 theoretical** **plates/meter**

" A separation is not only depending on the column efficiency. The selectivity is very important. Therefore, we provide many different phases. For instance, the C18 and PFP phases give complementary compound shape selectivity".

	Pore size (nm)	Particle size (µm)	Specific surface area (m ² /g)	Bonding	Carbon content (%)	Endcapping	Use the highest pressure (MPa)	Use pH range	USP L No.
SunShell C18 2.0 µm	2.0	9	120	C18	6.5	Sunniest endcapping	100	1.5 - 10	L1

SunShell C18
p/n CB1941
2.0µm
50mm X 2,1mm ID



SunShell C18
p/n CB1961
2.0µm
100mm X 2,1mm ID



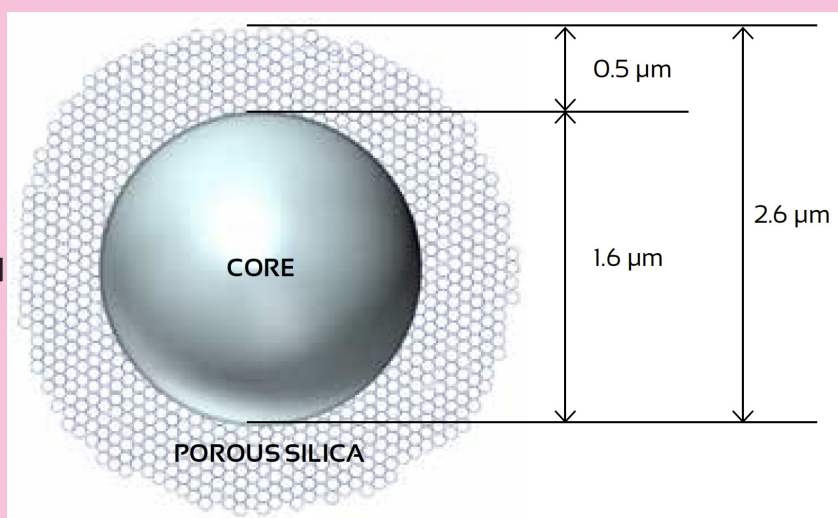
SunShell C18
p/n CB1971
2.0µm
150mm X 2,1mm ID



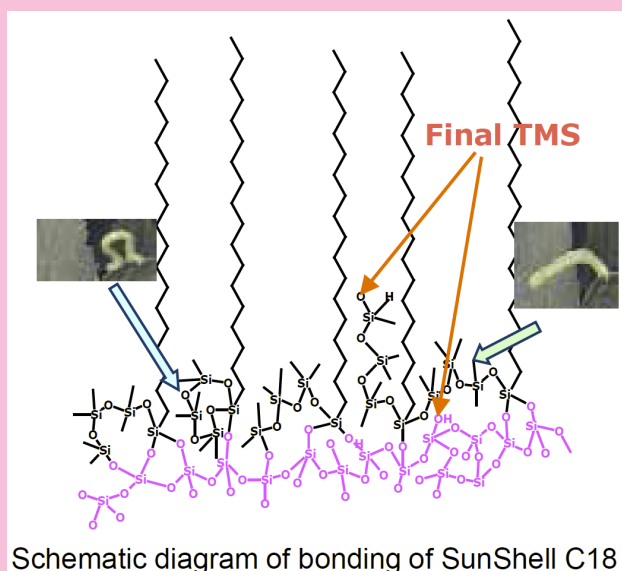
WHAT IS SUNSHELL? THE NEXT GENERATION HARDCORE SHELL PARTICLE

Secure your analysis with SunShell hardcore column technology. Unique bonding technology combined with core shell particles gives you faster performance and more reliable results. The SunShell technique assures top efficiency with all kinds of LC and UHPLC systems.

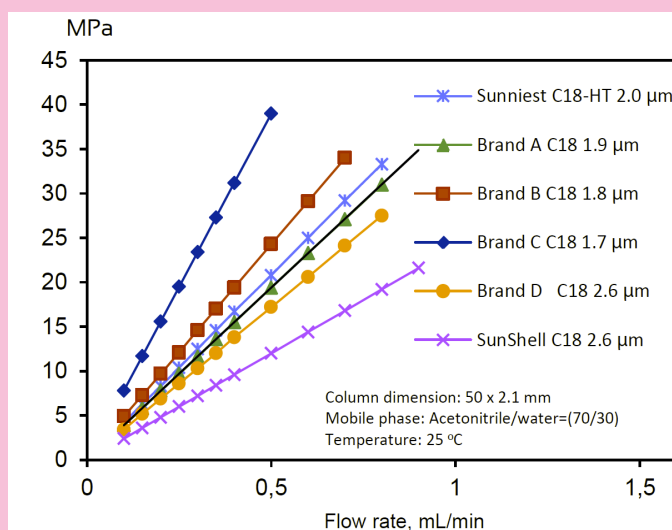
- 1.6 μm and 3.4 μm of core and 0.5 μm and 0.6 μm of superficially porous silica layer.
- Same efficiency and high throughput as a Sub-2 μm and 3 μm particle.
- Same pressure as a 3 μm and 5 μm particles.
- Same chemistry as Sunniest technology (reference figure below).
- Good peak shape for all compounds such as basic, acidic and chelating compounds.
- High stability (pH range for SunShell C18, 1.5 to 10).
- Low bleeding.



SunShell C18 shows same efficiency as a Sub 2 μm C18. In comparison between fully porous 2.6 μm and core shell 2.6 μm (SunShell), SunShell shows lower values for A term, B term and C term of Van Deemter equation. The core shell structure leads to higher performance compared with the fully porous structure. Furthermore back pressure of SunShell C18 is less than a half compared to Sub-2 μm C18s



Schematic diagram of bonding of SunShell C18



Comparison of back pressure for high throughput columns

HOW DOES SUNSHELL WORK? NARROW PARTICLE DISTRIBUTION



VAN DEEMTER EQUATION

Van Deemter Equation

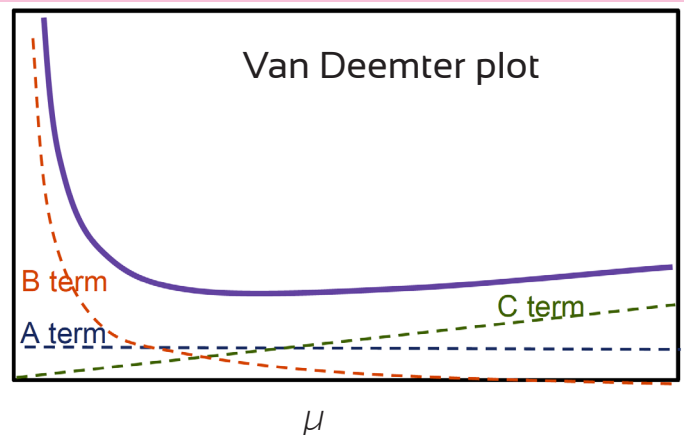
$$H = Ad_p + B \frac{D_m}{\mu} + C \frac{d_p^2}{D_m} \mu$$

A term : Eddy diffusion(d_p is particle diameter)

B term : Longitudinal diffusion
(D_m is diffusion coefficient)

C term: Mass transfer

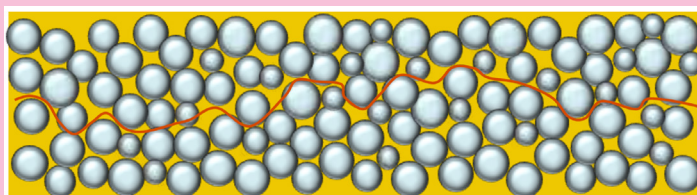
H



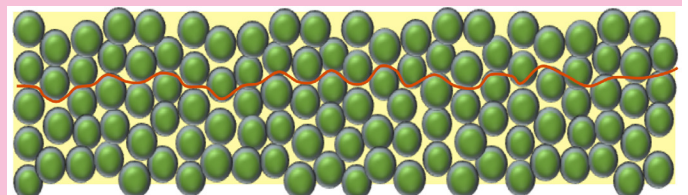
The size distribution of a core shell (Sun-Shell) particle is much narrower than that of a conventional totally

porous particle, so that the space in between the particles in the column is reduced and efficiency increases by

reducing Eddy Diffusion (multi-path diffusion) as the A term in Van Deemter Equation.



Wide particle distribution
(Conventional silica gel $D_{90}/D_{10}=1.50$)

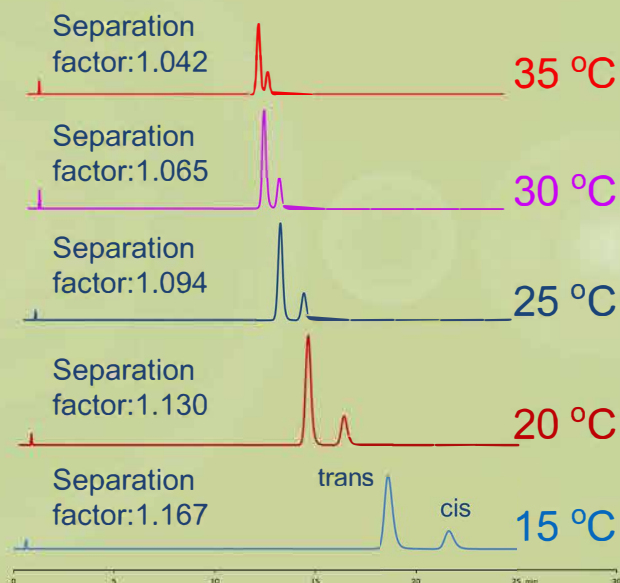


Narrow particle distribution
(Core Shell silica $D_{90}/D_{10}=1.15$)

New Products!!

SunShell C30

for Lipid-soluble compounds
and Isomers

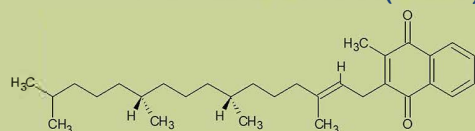


Column: SunShell **C30** 2.6 μm
100 x 2.1 mm

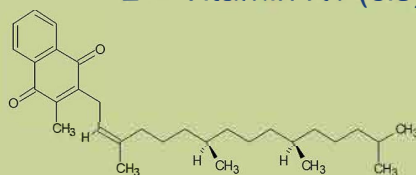
Mobile phase: Methanol/water = 96/4
Flow rate: 0.35 mL/min
Temperature: 15 ~ 35 °C
Detection: UV250 nm

Sample:

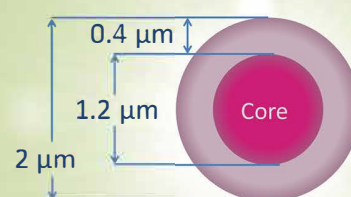
1 = Vitamin K1 (trans)



2 = Vitamin K1 (cis)



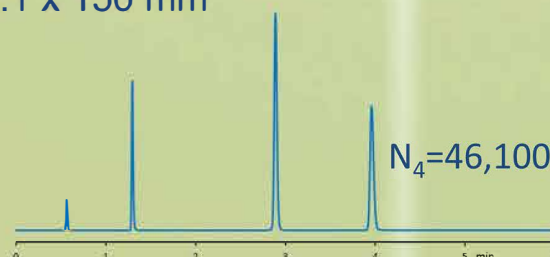
Pore size: 9 nm
Surface area: 120 m²/g
Carbon loading: 6.5% (C18)



Mobile phase:
Acetonitrile/water=70/30
Flow rate: 0.4 mL/min
Pressure: 64 MPa
Temperature: 25 °C

Sample: 1 = Uracil
2 = Ethylbenzoate
3 = Acenaphthene
4 = Butylbenzene

SunShell C18, **2 μm**
2.1 x 150 mm



Amazing!! **307,000 N/m**

UHPLC Column
SunShell C18

2 μm

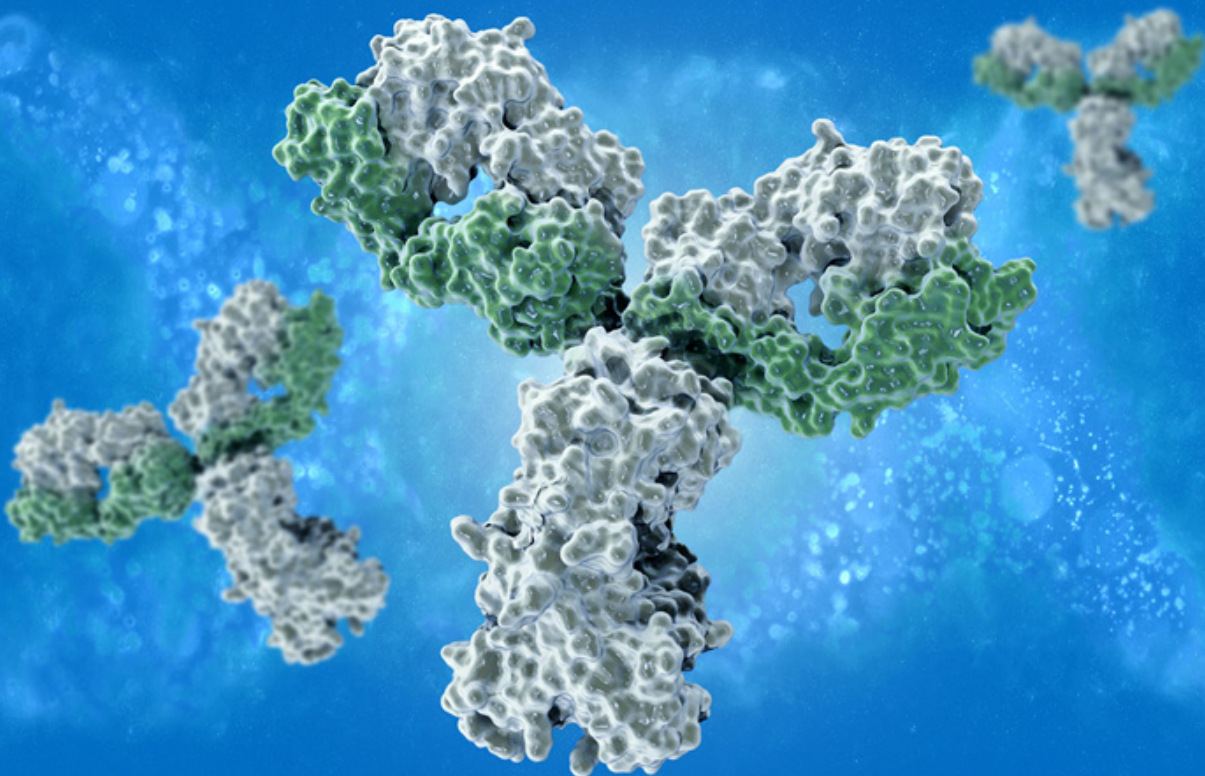


Troubleshooting Separations

SunShell C4-100



For Separation of Monoclonal Antibody

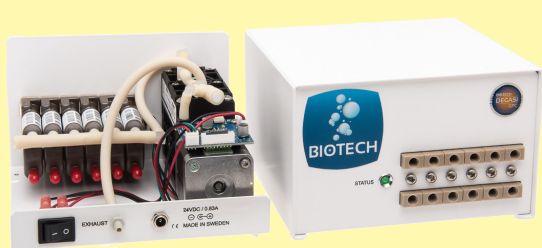


We are proud to announce the new column for large proteins such as monoclonal antibodies separation from ChromaNik Technologies Inc.

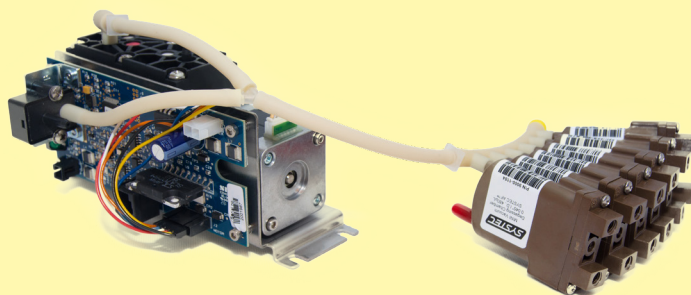
The new column has the following advantages:

- C4 stationary phase will elute target compounds without adsorption when using a mixture of trifluoroacetic acid solution and acetonitrile as a mobile phase while C8 stationary phase will adsorb and not elute.
- Pore size of 30 nm (300 Å) is not large enough for interactions, and interactions take place only where large pore distributions exist.
- Meantime, 100 nm (1000 Å) enables interactions in most areas and therefore 100 nm has larger sample load capacity than 30 nm even though the specific surface area of 100 nm packing material is smaller than its of 30 nm.
- Of course the structure of coreshell packing material realizes higher plate number compared to fully porous packing material. Due to the superficial porosity of coreshell packing material, the migration distance of molecules within pores is rather short, which gives advantages for the separation of large molecules with higher efficiency.

SPECIAL TAILORED OEM DEGASSERS

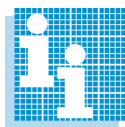


*Tips, Tricks and a little Troubleshooting
And we Customize your Degasser....*



Except for our unique range of DEGASi® Standalone degassers, Biotech offers custom made degassing modules to fit your need. Biotech supplies degassing modules to some of the world's largest instrument manufacturers.

We design according to your requests and needs, continuously developing new models for different applications, always assisting our customers with ideas and solutions along the way. We have degassers for a wide range of applications such as high flow, low flow and nasty organic solvents.



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