



Glantreo

Knowledge · Innovation · Service

SOLAS™ · EIROSHELL™ · SOLAD™

Functional Groups

C18

– USP L1

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

First choice stationary phase
– excellent results for a wide range of analytes

Superior peak shape, efficiency, resolution and lifetime for acids, bases, and neutrals

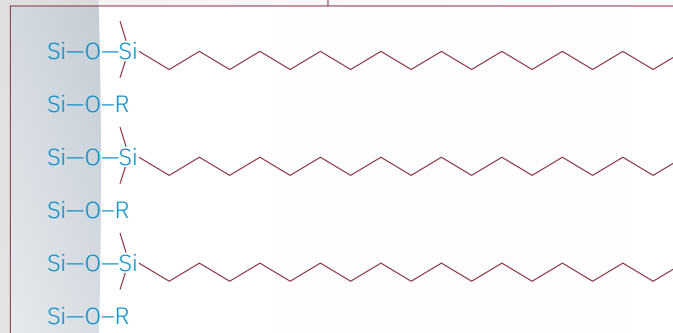
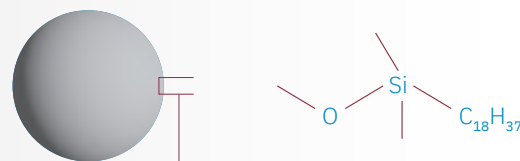
Key Properties

Separation Mechanism: **Hydrophobic Interaction**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 15–18%**
EIROSELL: 8–10%

Endcapping: **Yes 100%**

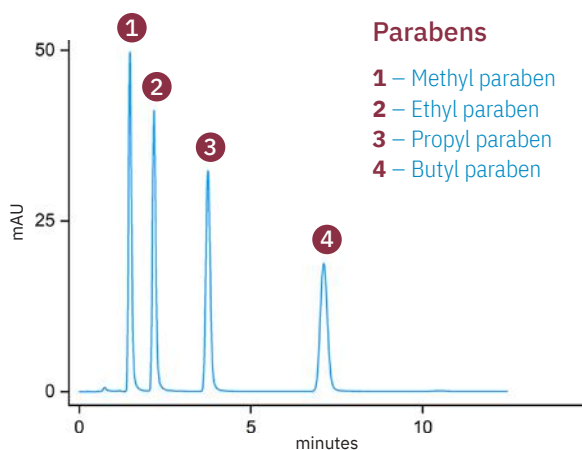


Recommended Application Areas

- Pharmaceuticals
- Steroids
- Fatty acids
- Vitamins
- Proteins

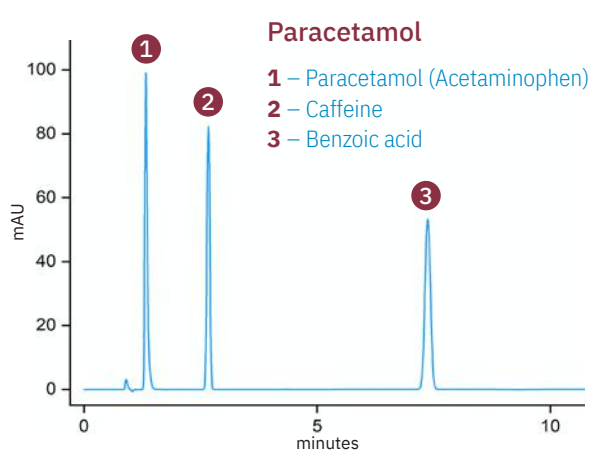
C18 Applications

SOLAS™ 1.7µm C18 50x2.1mm



Mobile Phase: 35/65 Acetonitrile/Water;
Flow rate: 0.2ml/Min; Injection Volume: 1.0µl;
UV: 254nm; Column Temperature: Ambient

EIROSELL™ 2.6µm C18 100x4.6mm



Mobile Phase: 69/28/3 Water/Methanol/Acetic Acid;
Flow rate: 1.0ml/Minute; Injection Volume: 1.0µl;
UV: 275nm; Column Temperature: Ambient

C18 plus

– USP L1

Available on all **Glantreo** silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Coated with proprietary bonding technology which ensures higher hydrophobic interactions and exceptionally low bleeding

Extended pH range from 1 – 12 for a wide range of applications

High pH stability and chemical resistance for long column lifetime, reliability, and reproducibility

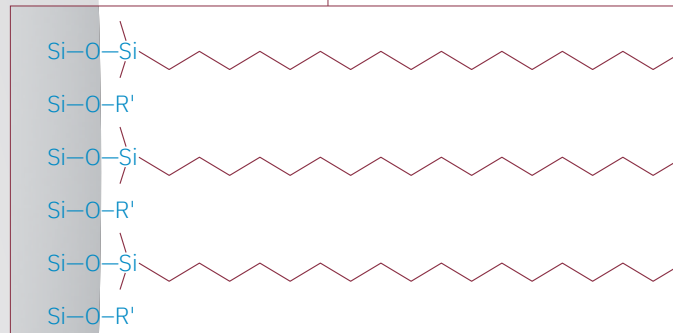
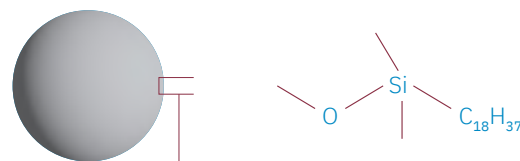
Key Properties

Separation Mechanism: **Hydrophobic Interaction**

pH Range: **1 to 12**

Carbon Load (100Å Pore Size): **SOLAS: 16 – 19%**
EIROSELL: 8 – 10%

Endcapping: **Yes, proprietary**



Recommended Application Areas

Acids, Bases, and Neutrals
across a wide pH range

Pharmaceuticals

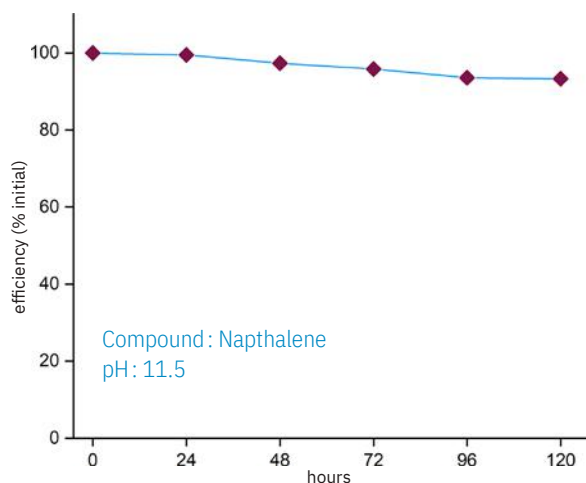
Biomolecules – Proteins, Peptides,
Oligonucleotides, Glycans

Vitamins

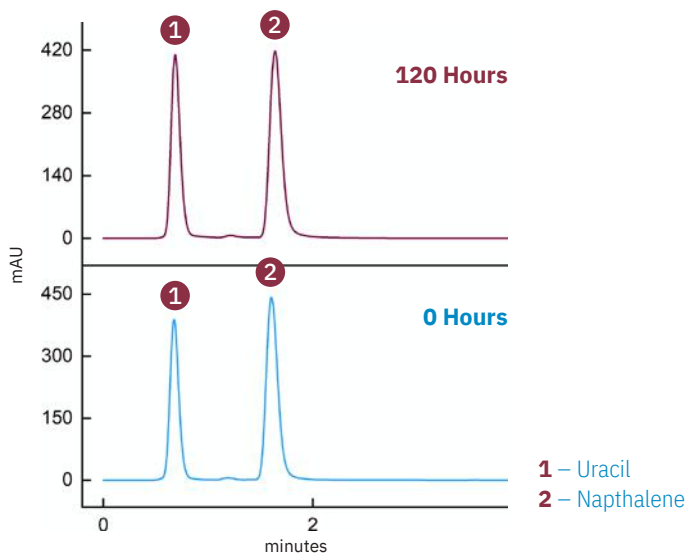
C18 Plus Applications 1/2

1. High pH Stability

EIROSELL™ 2.6µm C18 Plus 50x2.1mm



Mobile Phase: 0.1% TEA in 50/50 Acetonitrile/Water;
Mobile phase pH – 11.5; Flow rate:0.2ml/Min;
Injection Volume: 5.0µL; UV: 254nm;
Column Temperature: 25°C

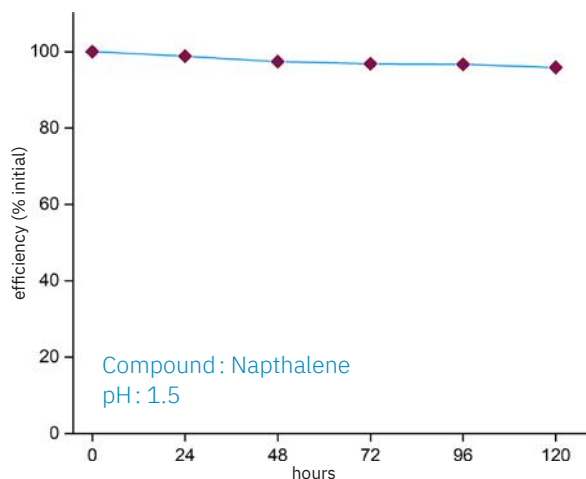


Tips/Advice: Always use a guard column to protect the column from particulates and other detrimental sample components, to increase the column lifetime

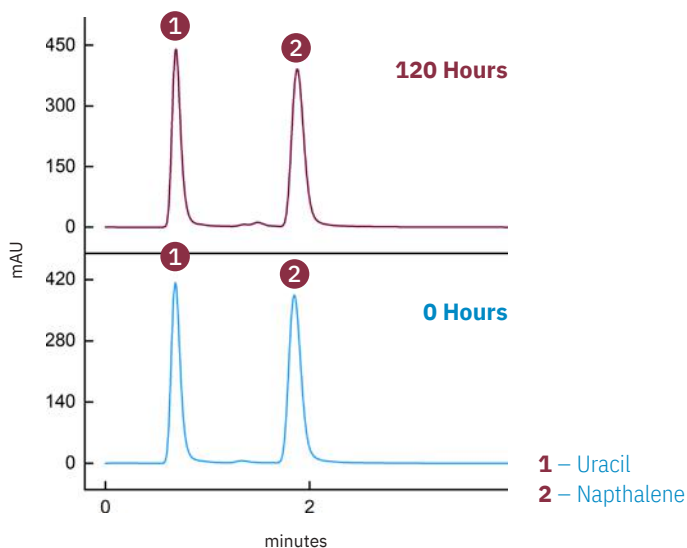
C18 Plus Applications 2/2

2. Low pH Stability

EIROSELL™ 2.6µm C18 Plus 50x2.1mm



Mobile Phase: 0.1% TEA in 50/50 Acetonitrile/Water;
Mobile phase pH – 1.5; Flow rate:0.2mL/Min;
Injection Volume:5.0uL; UV: 254nm; Column
Temperature: 25°C

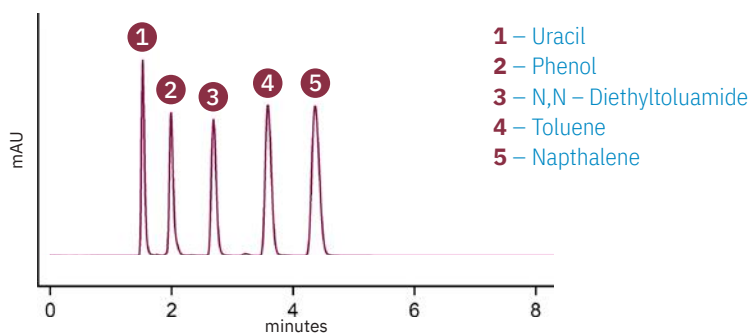


3. Comparison between C18 Plus and C18

Conclusion: Glantreo C18 Plus offers similar elution order and efficiency as Glantreo C18. This is achieved at lower flow rates...a greener alternative with reduced running costs.

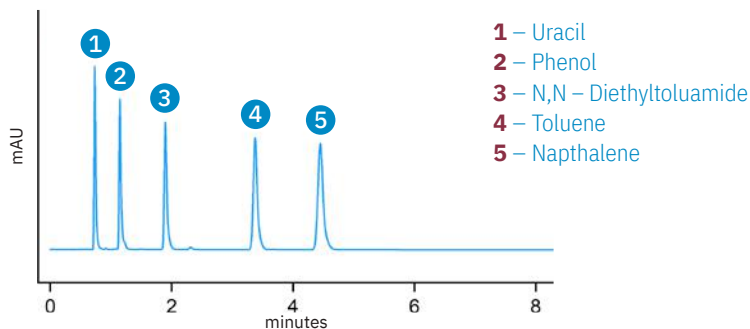
EIROSELL™ 2.6 µm C18 Plus, 50x2.1mm

Mobile Phase: 60/40 Acetonitrile/Water;
Flow rate:0.5ml/Min; Injection Volume:1.0µl;
UV: 254nm; Column Temperature: Ambient



EIROSELL™ 2.6 µm C18, 50x2.1mm

Mobile Phase: 60/40 Acetonitrile/Water;
Flow rate:1.0ml/Min; Injection Volume:1.0µl;
UV: 254nm; Column Temperature: Ambient



C8

– USP L7

- Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).
- Classical C8 phase, ideal for non-polar compounds that are retained too strongly on a traditional C18 column
- Outstanding chemical and mechanical stability, with excellent peak shapes, efficiency, reproducibility and reliability

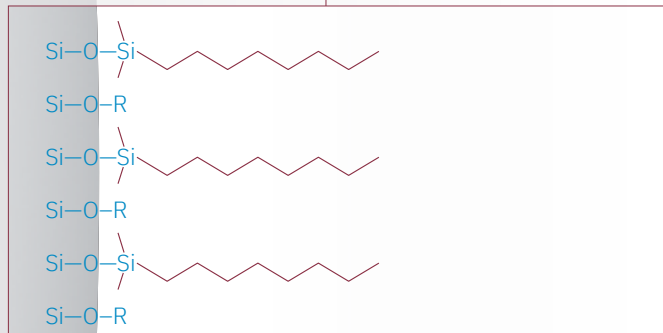
Key Properties

Separation Mechanism: **Hydrophobic Interaction**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 7–9%**
EIROSELL: 6–8%

Endcapping: **Yes 100%**



Recommended Application Areas

Pharmaceuticals

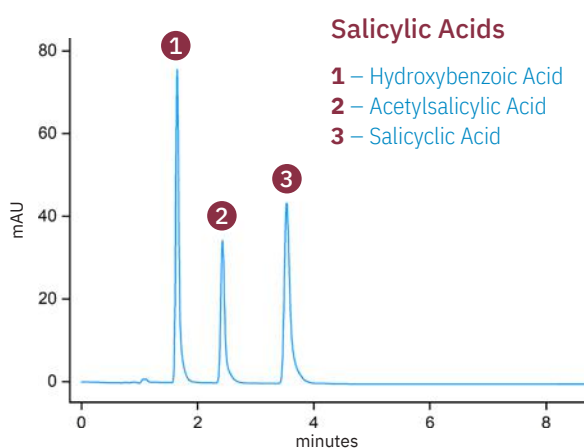
Steroids

Vitamins

Environmental

C8 Applications

SOLAS™ 1.7µm C8 100x4.6mm

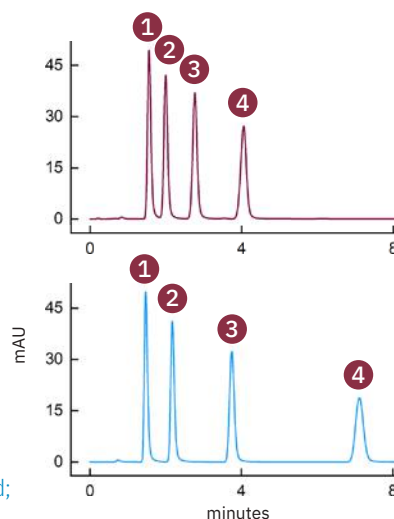


Salicylic Acids

- 1 – Hydroxybenzoic Acid
- 2 – Acetylsalicylic Acid
- 3 – Salicylic Acid

Mobile Phase: 40/58/2 Acetonitrile/Water/Phosphoric Acid;
Flow rate:1.0ml/Minute; Injection Volume: 1.0µl;
UV: 237nm; Column Temperature: Ambient

Comparison between C8 and C18



SOLAS™ 1.7 µm **C8**, 50x2.1mm

Mobile Phase: 35/65 Acetonitrile/
Water; Flow rate:0.2ml/Min; Injection
Volume:1.0µl; UV: 254nm; Column
Temperature: Ambient

SOLAS™ 1.7 µm **C18**, 50x2.1mm

Mobile Phase: 35/65 Acetonitrile/
Water; Flow rate:0.2ml/Min; Injection
Volume:1.0µl; UV: 254nm; Column
Temperature: Ambient

Parabens

- 1 – Methyl Paraben
- 2 – Ethyl Paraben
- 3 – Propyl Paraben
- 4 – Butyl Paraben

Tips/Advice: For column cleaning, all Glantreo columns can be used in reversed flow direction. Follow the appropriate cleaning procedure. Columns should be washed after each use.

C4

– USP L26

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Unique selectivity and increased retention for highly polar/hydrophilic compounds. Can be used in Reversed-phase, HILIC, Ion-pairing modes.

Lower hydrophobicity than C8 and C18, leading to faster separations for very hydrophobic compounds with outstanding efficiency and sensitivity.

Key Properties

Separation Mechanism: **Hydrophobic Interaction**

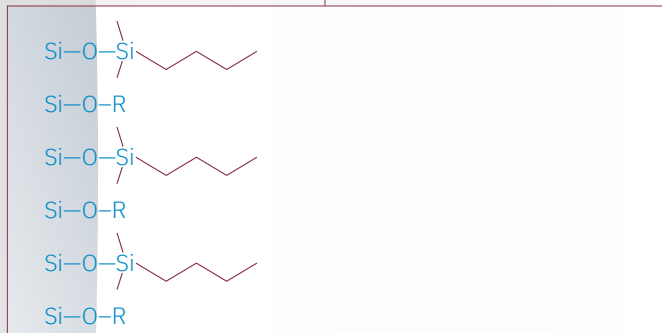
pH Range: **2 to 10**

Carbon Load (1000Å Pore Size): **SOLAS: < 1%**
EIROSELL: < 1%

Carbon Load (300Å Pore Size): **SOLAS: 3 – 5%**
EIROSELL: 4 – 6%

Carbon Load (100Å Pore Size): **SOLAS: 3 – 5%**
EIROSELL: 4 – 6%

Endcapping: **Yes 100%**



Recommended Application Areas

Proteins, Peptides, Amino Acids

Hormones

Polar Acids and Bases

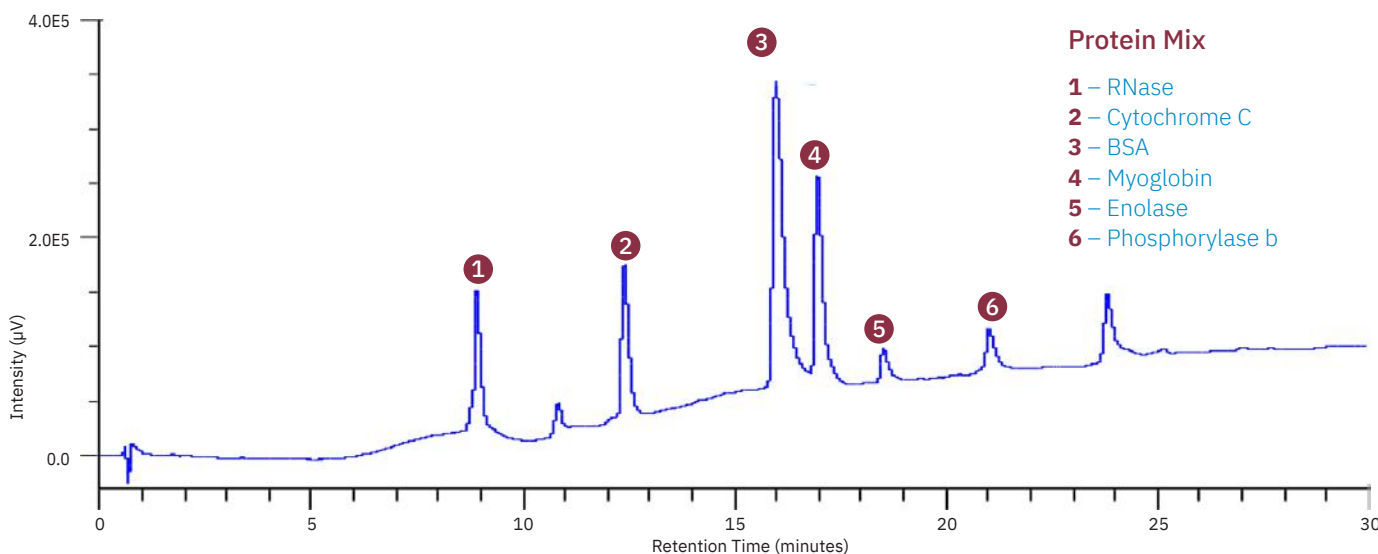
Nucleosides, Oligonucleotides

Vitamins

100Å Pore Size – up to 5000 Da
300Å Pore Size – up to 50 kDa
1000Å Pore Size – up to 150 kDa

C4 Applications 1/2

EIROSELL™ BIO 2.6µm C4 50x2.1mm 1000Å



Protein Mix

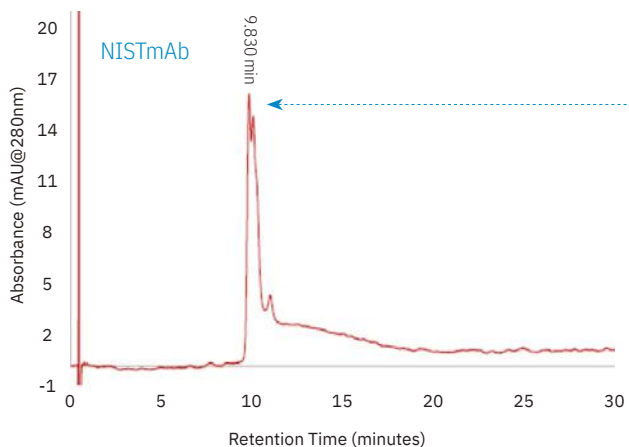
- 1 – RNase
- 2 – Cytochrome C
- 3 – BSA
- 4 – Myoglobin
- 5 – Enolase
- 6 – Phosphorylase b

Mobile Phase: A- 0.1% TFA in Water B- 0.075% TFA in Acetonitrile Gradient- %B 18-70% in 0-25 minutes;
Flow rate: 0.2ml/minute; injection volume:5.0µL; UV: 220nm; Column Oven Temperature: 60°C

Tips/Advice: Our Controlled and Stable Porosity (CSP) technology ensures stationary phase stability, even at larger pore sizes. Our 100Å pore sized columns are stable at up to 1200 bar.

C4 Applications 2/2

SOLAS™ BIO 1.7µm C4 50x2.1mm 1000Å



Mobile Phases (AMT):

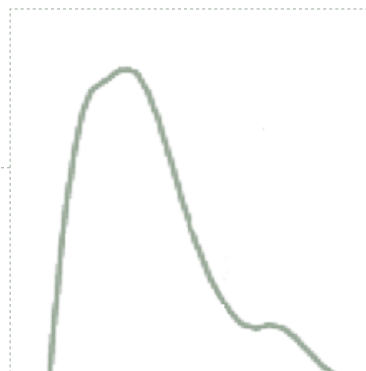
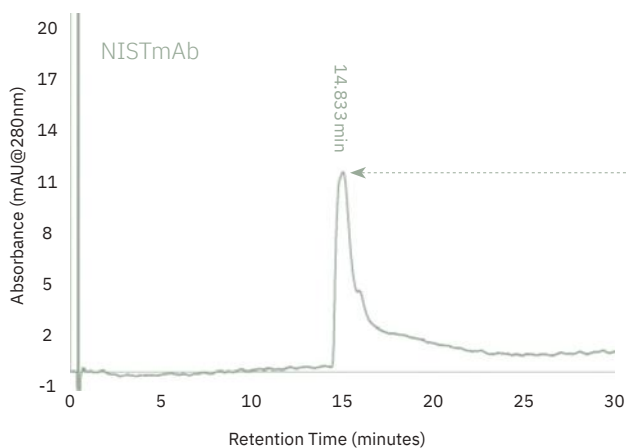
A: LC-MS grade water containing 5% n-propanol, 0.2% TFA

B: LC-MS grade water containing 70% n-propanol, 20% acetonitrile, 0.2% TFA

Flow Rate: 0.4ml/min; Detection: 205nm, 214nm, 240nm, 280nm;

Temperature: 60°C

Competitor 1.7µm C4 50x2.1mm 300Å



Mobile Phases (AMT):

A: LC-MS grade water containing 5% n-propanol, 0.2% TFA

B: LC-MS grade water containing 70% n-propanol, 20% Acetonitrile, 0.2% TFA

Flow Rate: 0.4ml/min; Detection: 205 nm, 214 nm, 240 nm, 280 nm;

Temperature: 60°C

Aqua

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Orthogonal selectivity to alkyl phases, with enhanced separation and resolution for samples containing polar, acidic, and basic compounds

Superior stability and durability even under highly aqueous mobile phase

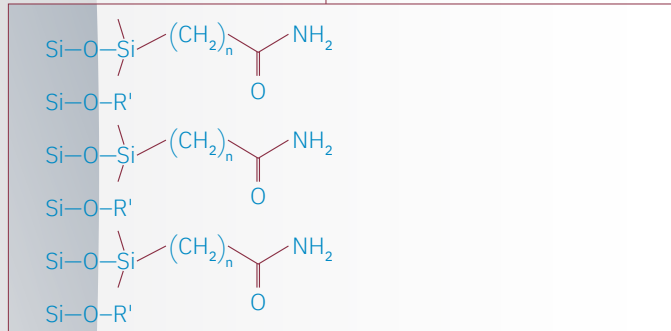
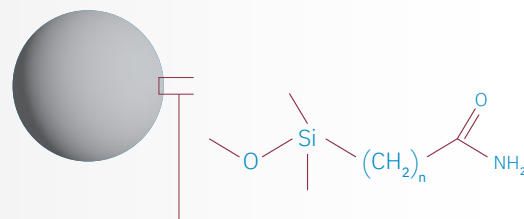
Key Properties

Separation Mechanism: **Hydrophobic and hydrophilic interactions**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 18–20%**
EIROSELL: 8–10%

Endcapping: **Yes**



Recommended Application Areas

Biomolecules

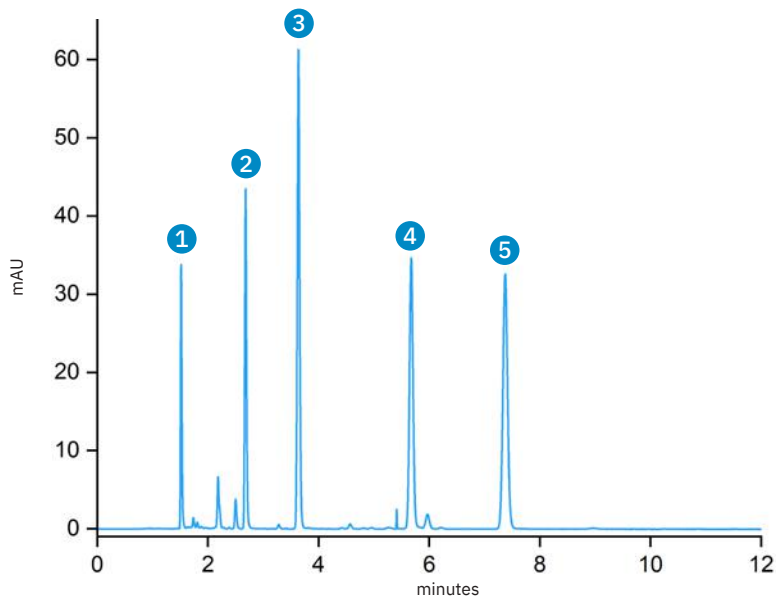
Alcohols, Phenols and Catechins

Polar Acids and Bases

Sugars and carbohydrates

Aqua Applications

SOLAS™ 5.0µm Aqua, 250x4.6mm



- 1** – Uracil
- 2** – Benzene
- 3** – Ethyl benzene
- 4** – Butyl benzene
- 5** – Pentyl benzene

Mobile Phase: 80/20 Acetonitrile/Water (v/v);
Flow rate: 1.5 ml/min; Injection volume: 1.0 µl;
UV: 254 nm ;Temperature: 25°C; Detector:

Tips/Advice: For optimum peak shape and sensitivity, it is recommended to prepare the sample in the operating mobile phase or to use a mobile phase, that is a weaker solvent than the mobile phase.

C30

– USP L62

Available on all Glantreo silica materials
(fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™**
particles and non-porous **SOLAD™** particles).

Higher hydrophobic retention than C18 column

High shape selectivity for hydrophobic, long-chain,
structurally related isomers

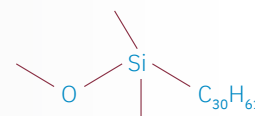
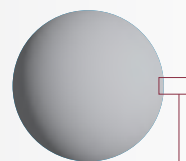
Key Properties

Separation Mechanism: **Strong Hydrophobic Interaction**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 24 – 28%**
EIROSELL: 12 – 15%

Endcapping: **Yes 100%**



Recommended Application Areas

Fat-soluble vitamins

Isomers

Lipids, Carotenoids

Steroids

Tips/Advice: Never use long chain reversed phases like C30 and classical C18 phases with 100% aqueous mobile phase. The hydrophobic chains will collapse.

C1 (TMS)

– USP L13

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Unique selectivity for multifunctional compounds, can be used in both Normal-phase and reversed phase modes

Suitable for hydrophilic, highly polar compounds which are difficult to separate with general reversed-phase or normal-phase columns.

Unique stationary bonding technology, providing high efficiency and excellent peak shape symmetry

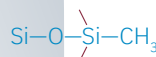
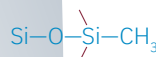
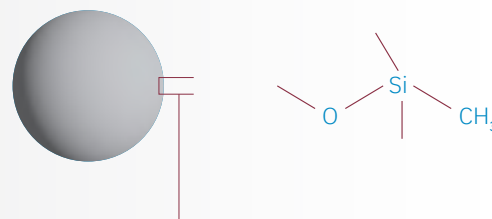
Key Properties

Separation Mechanism: **Weak Hydrophobic and Hydrophilic interactions**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: < 1%**
EIROSELL: < 1%

Endcapping: **Yes 100%**



Recommended Application Areas

Multifunctional compounds

Hydrophobic proteins, peptides, vitamins in reversed-phase mode

Polar compounds in normal-phase mode

Tips/Advice: Use only high-purity HPLC solvents and buffers. This will not only help to preserve the lifetime of the column, but also prevent unknown chromatographic peaks due to impurities.

Phenyl

– USP L11

Available on all Glantreo silica materials
(fully-porous SOLAS™ particles, superficially-porous EIROSELL™ particles and non-porous SOLAD™ particles)

Complementary selectivity to alkyl phases, with preferential retention of aromatic compounds

Excellent choice for analysing complex mixtures of polar and non-polar analytes, especially mixtures containing aromatic compounds

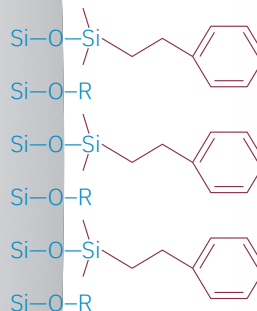
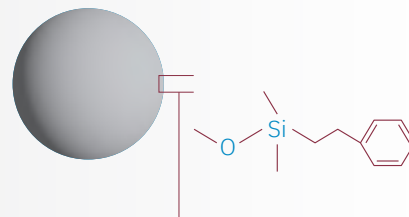
Key Properties

Separation Mechanism: **Hydrophobic Interaction, Aromatic and π - π Interaction**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 4 – 6%
EIROSELL: 2 – 3%**

Endcapping: **Yes 100%**



Recommended Application Areas

Proteins and peptides

Pharmaceuticals

Structural isomers

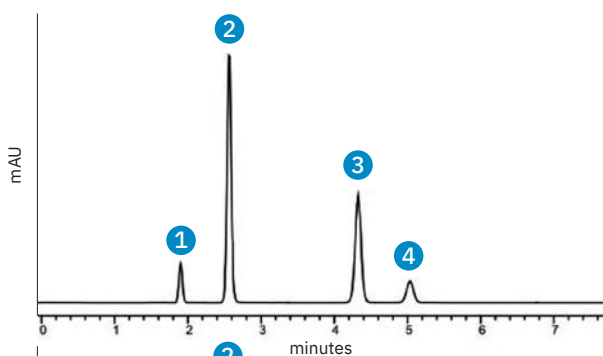
Nucleosides, Oligonucleotides

Phenyl Applications

Comparison between Phenyl and C18

SOLAS™ 5µm Phenyl, 150 x 4.6mm

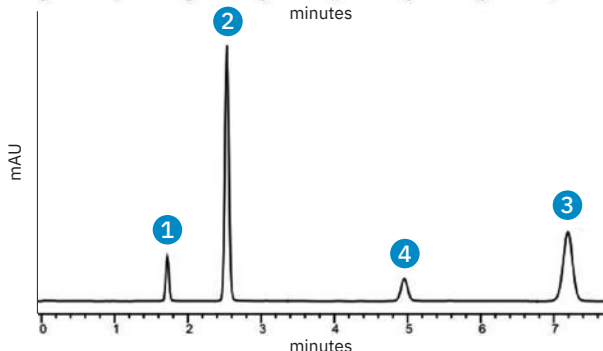
Mobile Phase: 70/30 Methanol/Water;
Flow rate: 1 ml/min; Injection Volume: 1.0µL;
UV: 254nm, Column Temperature: 24°C



1 – Uracil
2 – Phenol
3 – Toluene
4 – Chloro-4-nitrobenzene

SOLAS™ 5µm C18, 150 x 4.6mm

Mobile Phase: 70/30 Methanol/Water;
Flow rate: 1 ml/min; Injection Volume: 1.0µL;
UV: 254nm, Column Temperature: 24°C



1 – Uracil
2 – Phenol
3 – Toluene
4 – Chloro-4-nitrobenzene

Tips/Advice: When setting the flow rate, begin at a low flow rate and gradually increase the flow to the desired level, to minimise the physical shock to the column.

Phenyl Hexyl

– USP L11

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Complementary selectivity to alkyl phases, offering balanced hydrophobic and aromatic selectivity

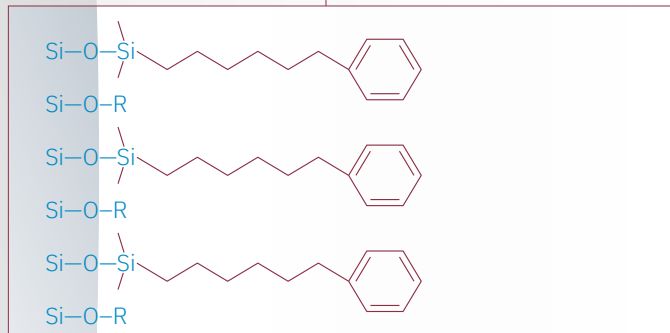
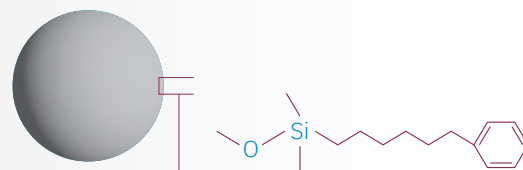
Key Properties

Separation Mechanism: **Hydrophobic Interaction, Aromatic and π - π Interaction**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 8–10%**
EIROSELL: 5–6%

Endcapping: **Yes**



Recommended Application Areas

Proteins, Peptides, Amino Acids

Hormones

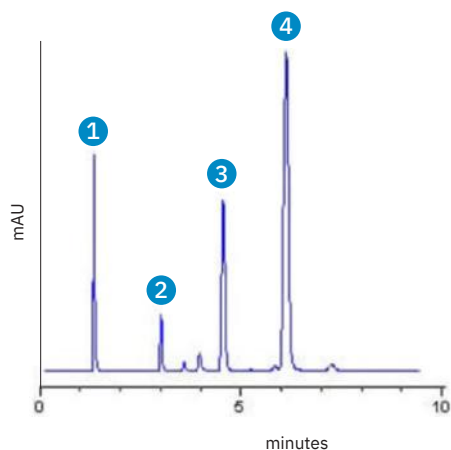
Polar Acids and Bases

Nucleosides, Oligonucleotides

Vitamins

C18 Applications

SOLAS™ 5µm Phenyl Hexyl, 150 x 4.6mm



Steroids

- 1** – Prednisolone
- 2** – Hydrocortison
- 3** – Cortisone
- 4** – Progesterone

Mobile Phase: 60/40 Methanol/Water;
Flow rate: 1ml/min; Injection Volume: 1.0µL;
UV: 254nm; Colum Temperature: 30°C

Tips/Advice: For optimum column lifetime, a mobile phase pH of 2-8 is recommended. The Glantreo C18 Plus and Phenyl Hexyl Plus phases are compatible with an extended pH range of 1-12

Phenyl Hexyl Plus

– USP L11

Available on all Glantreo silica materials

(fully-porous SOLAS™ particles, superficially-porous EIROSHELL™ particles and non-porous SOLAD™ particles)

Complementary selectivity to alkyl phases, offering balanced hydrophobic and aromatic selectivity

Extended pH range from 1-12 for a wide range of applications

High pH stability and chemical resistance for high column lifetime, reliability, and reproducibility

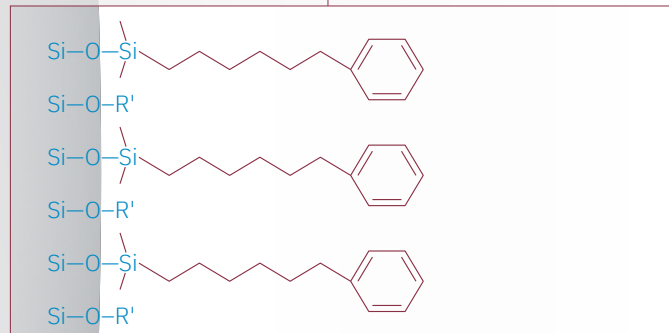
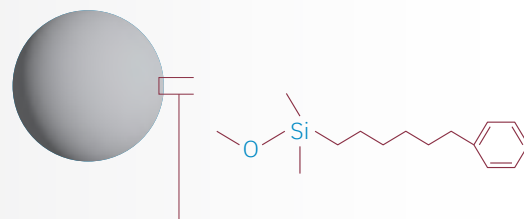
Key Properties

Separation Mechanism: **Hydrophobic Interaction, Aromatic and π - π Interaction**

pH Range: **1 to 12**

Carbon Load (100Å Pore Size): **SOLAS: 8 – 10%**
EIROSHELL: 5 – 6%

Endcapping: **Yes**



Recommended Application Areas

Proteins, Peptides, Amino Acids

Hormones

Polar Acids and Bases

Nucleosides, Oligonucleotides

Vitamins

Tips/Advice: It is very important to make sure that your column is clean before storage. This includes removal of buffer, salts, sample, and ion-pairing agents. Store the column in the recommended solvent mentioned in the Glantreo Certificate of Analysis supplied with the column.

BiPhenyl

– USP L11

Available on all Glantreo silica materials
(fully-porous SOLAS™ particles, superficially-porous EIROSHELL™ particles and non-porous SOLAD™ particles)

Complementary selectivity to alkyl phases

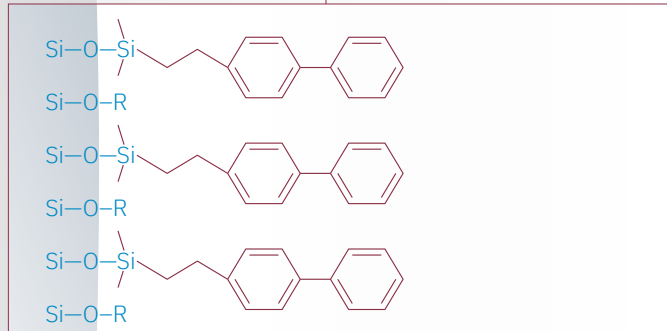
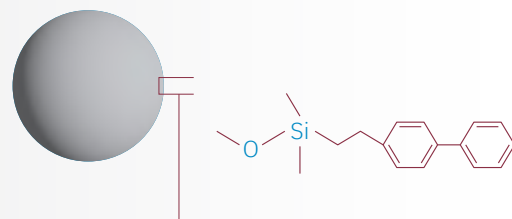
Key Properties

Separation Mechanism: **Hydrophobic Interaction, Aromatic and π - π Interaction**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 8 – 10%
EIROSHELL: 5 – 6%**

Endcapping: **Yes**



Recommended Application Areas

Drugs of Abuse

Bioanalysis

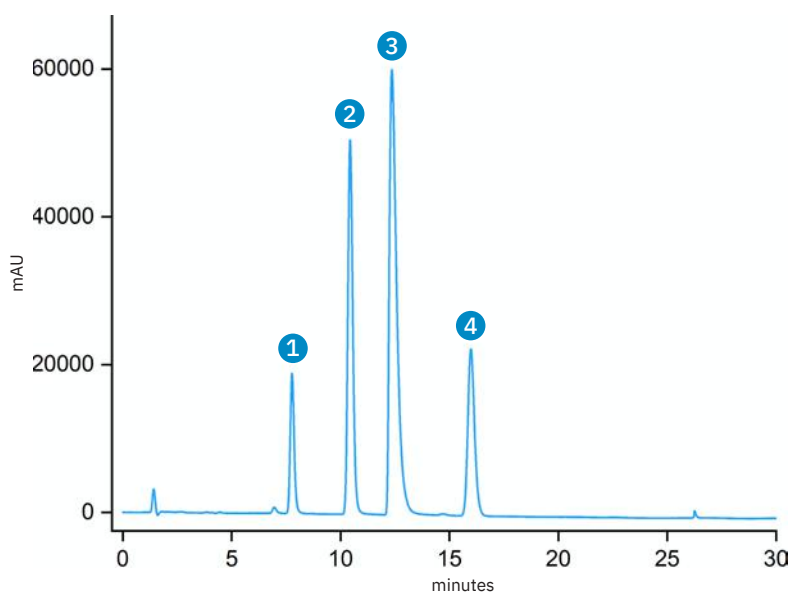
Clinical, forensics and toxicology

Explosives

Steroids, tetracyclines

BiPhenyl Applications

EIROSHELL™ 2.6µm CYANO, 150x4.6mm



- 1 – Benzene
- 2 – p-Tolunitrile
- 3 – N,N-Dimethylaniline
- 4 – 1,3,5-Trinitrobenzene

Mobile Phase: 80/20 Acetonitrile/Water;
Flow rate: 0.2 ml/min;
Injection Volume: 1.0µL; UV: 254 and 214 nm;
Column Temperature: 40°C

Tips/Advice: Columns should be handled with care, as every drop or shock can damage the column or the column bed.

PFP

– USP L43

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Unique orthogonal selectivity to alkyl, phenyl and phenyl-hexyl phases with superior steric selectivity

Can be used in reversed phase and HILIC modes

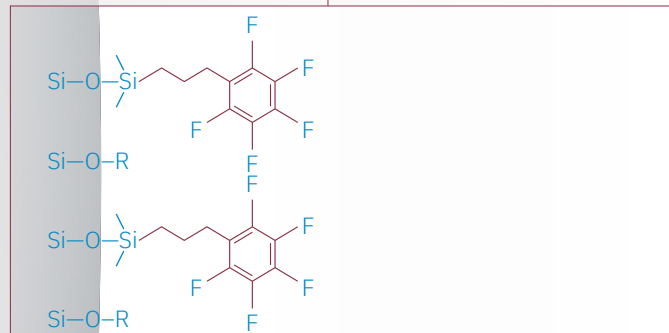
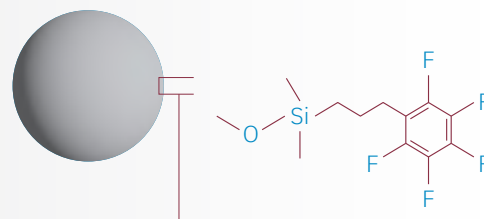
Key Properties

Separation Mechanism: **Hydrophobic Interaction, Aromatic and π - π Interaction, Dipole-dipole Interaction, Hydrogen Bonding**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 5 – 6%
EIROSELL: 4 – 6%**

Endcapping: **Yes**



Recommended Application Areas

Complex natural products

Steroids and highly polar pharmaceuticals

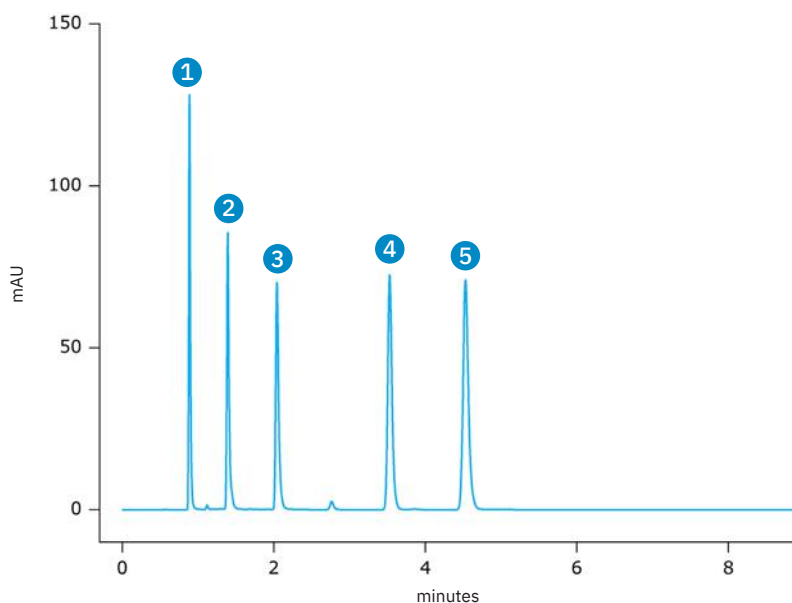
Amines, esters and ketones

Substituted aromatics

Isomeric compounds

PFP Applications

EIROSELL™ 2.6µm PFP, 50x4.6mm



- 1** – Malic Acid
- 2** – Doxylamine
- 3** – Chlorpheniramine
- 4** – Bromopheniramine
- 5** – Diphenhydramine

Mobile Phase: (A) 20 mM Potassium Phosphate, pH 2.5
(B) Acetonitrile; Gradient: A/B (90:10) to (20:80) in 15 mins; Flow rate: 1ml/min; Injection Volume: 1.0µL; UV: 220nm; Column Temperature: 22°C

Tips/Advice: Before injecting the sample, thoroughly equilibrate the column with the mobile phase to be used at the same flow rate and temperature as the method to be applied, to ensure stable chromatographic separation.

Silica

– USP L3

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

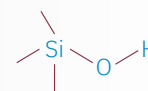
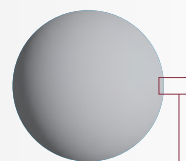
Ultra-pure, unbonded deactivated silica phase which offers excellent peak shape and selectivity for non-polar and moderately polar compounds

Traditional normal phase for use in 100% organic mobile phases. Can also be used in HILIC mode

Key Properties

Separation Mechanism: **Hydrophobic Interaction**

pH Range: **2 to 10**



Si–O–H

Si–O–H

Si–O–H

Si–O–H

Si–O–H

Recommended Application Areas

Small pharmaceutical compounds

Positional isomers

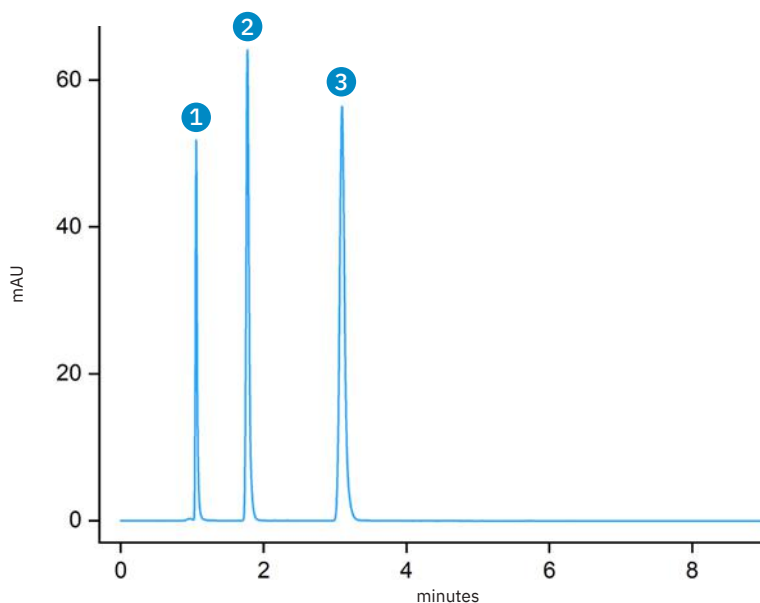
Fat soluble compounds

Food additives

Polar compounds

Silica Applications

SOLAS™ 5.0µm Silica, 150 x 4.6mm



- 1 – Napthalenee
- 2 – Uracil
- 2 – Cysteine

Mobile Phase: 80/20 Acetonitrile/Water/25 mM Ammonium Acetate, pH 6.8 ;
Flow rate: 1.5 mL/min; Injection Volume: 1.0µL;
UV: 254 nm; Column Temperature: Ambient

Tips/Advice: Contamination of the column by impurities from the sample or mobile phase can cause changes in peak shape, peak splitting, shifts in retention or high backpressure. Clean the column every single time after analysis to prolong column lifetimes.

Diol

– USP L20

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Unique HILIC phase offering increased retentivity and reproducibility. Also offers alternate selectivity to reversed-phase and normal-phase modes

Intermediate polarity between C18 and silica, ideal for separation of low to mid-polar analytes which are difficult to resolve in other phases

Can be used with a wide range of solvents

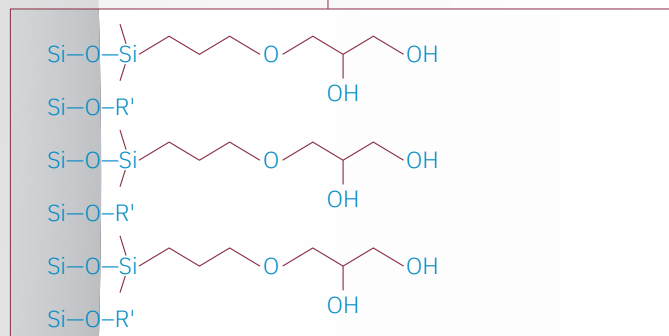
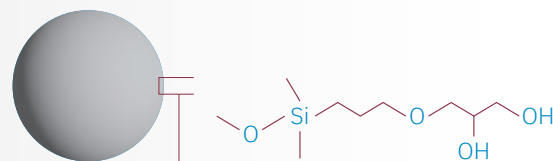
Key Properties

Separation Mechanism: **Hydrophobic Interaction**

pH Range: **2 to 10**

Carbon Load (1000Å Pore Size): **SOLAS: 4 – 6%**
EIROSELL: 1 – 2%

Endcapping: **Yes**



Recommended Application Areas

Sugars

Amino acids and
water-soluble vitamins

Polar biomolecules

Pharmaceutical Metabolites

Pesticides and Herbicides

Polar natural products

Tips/Advice: Use freshly prepared mobile phases and buffers to prevent bacterial growth, particularly for low buffer concentrations and mobile phases around pH 7.

Cyano

– USP L10

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Complementary selectivity to alkyl phases, and can be used for a wide range of applications in both reversed-phase and normal-phase modes.

Offers strong retention for highly polar and mid-polar compounds, and faster separation of non-polar compounds than alkyl phases

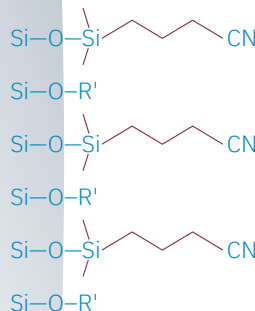
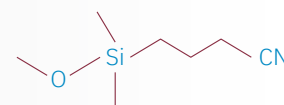
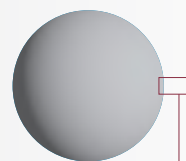
Key Properties

Separation Mechanism: **Hydrophobic and hydrophilic interactions**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 5–6%**
EIROSELL: 2–3%

Endcapping: **Yes**



Recommended Application Areas

Polar and very polar bases, acids, and neutrals

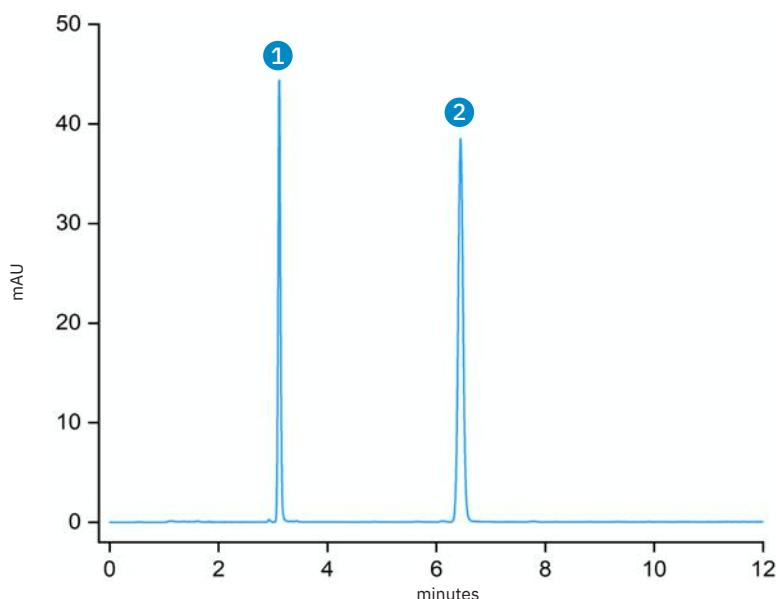
Explosives

Pharmaceuticals

Steroids

Cyano Applications

EIROSELL™ 2.6µm Cyano, 150x4.6mm



1 – Acetophenone
2 – Heptanophenone

Mobile Phase: 50/50/1 Acetonitrile/Water/75 mM Ammonium Acetate;
Flow rate: 1 ml/min; Injection Volume: 1.0µL;
UV: 254nm; Column Temperature: 25°C

Tips/Advice: It is advisable to check the performance of the column, before and after any cleaning protocol, using the QC test conditions on the accompanying chromatogram in the Glantreo Certificate of Analysis.

Amino

– USP L8

Available on all Glantreo silica materials (fully-porous **SOLAS™** particles, superficially-porous **EIROSELL™** particles and non-porous **SOLAD™** particles).

Versatile stationary phase which can be used in normal phase, reversed-phase, weak anion-exchange and HILIC modes

Proprietary bonding technology with ultra-inert, high-efficiency particles for high robustness and reproducibility

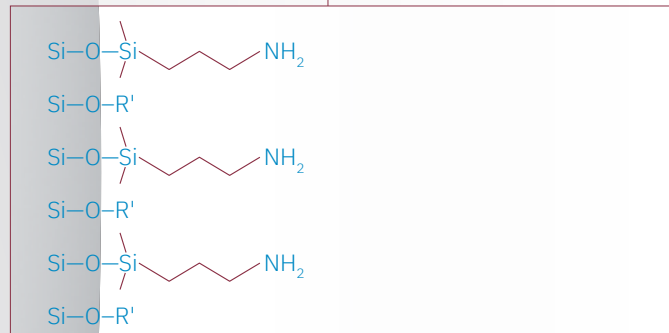
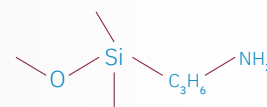
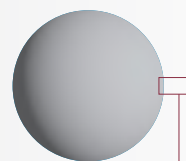
Key Properties

Separation Mechanism: **Hydrophilic and Ionic interactions**

pH Range: **2 to 10**

Carbon Load (100Å Pore Size): **SOLAS: 4 – 5%**
EIROSELL: 2 – 3%

Endcapping: **Yes**



Recommended Application Areas

Sugars and sugar alcohols

Nucleosides, nucleotides,
and oligonucleotides

Carbohydrates and vitamins

Anions and organic acids



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