Sepax UHPLC Column Products

Silica Based Packings

Stationary Phases

C18 C8 C4

Phenyl NH_2 CN

Description

Sepax UHPLC silica packings use high purity (<10 ppm metals), spherical silica with the particle selection of 1.8 and 2.2 µm and the pore size of 120 Å. Their bonded phases include C18, C8, C4, Phenyl, Amino, Cyano, strong anion, strong cation, and HILIC. Their unique mono-functional bonding chemistry allows high efficiency, high selectivity and high speed separation. All sub-2 micron particles and bonded phases have excellent resistance to high pressure (>10,000 psi). As an example in Figure 1, 2.2 µm GP-C18 shows a reduced plate height of 2.22 µm, which is equivalent to plate number of 200,448 per meter.

Specifications

Phases	Particle size (µm)	Pore size (Å)	Surface area (m^2/g)	Carbon loading	pH range
GP-C18	1.8, 2.2	120	300	17.0%	2-8.5
BR-C18	1.8, 2.2	120	300	19.0%	1.5-10.5
GP-C8	1.8, 2.2	120	300	11.0%	2-8.5
GP-C4	1.8, 2.2	120	300	8.0%	2-8.5
GP-Phenyl	1.8, 2.2	120	300	11.0%	2-8.5
HP-Cyano	1.8, 2.2	120	300	7.0%	2-8.5
HP-Amino	1.8, 2.2	120	300	4.0%	2-8.5
HP-SCX	1.8, 2.2	120	300	11.0%	2-8.5
HP-SAX	1.8, 2.2	120	300	16.0%	2-8.5
HP-Silica	1.8, 2.2	120	300	0.0%	2-8.5
HILIC Polar-100	1.8, 2.2	120	300	11.0%	2-8.5

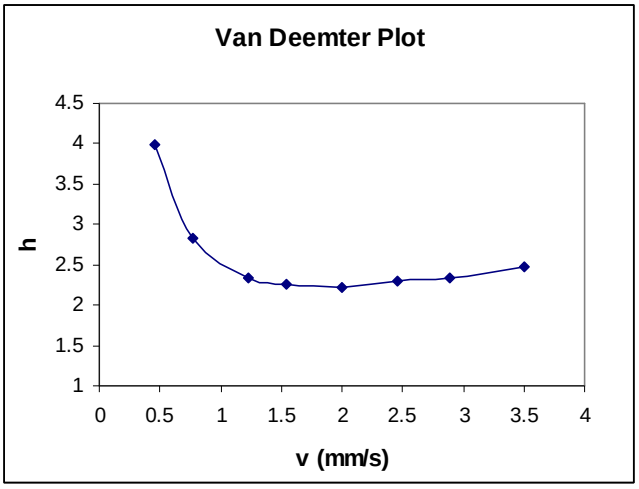


Figure 1. Reduced plate height (h) vs. linear flow rate (v).
Column: GP-C18 (2.2 µm, 4.6x50 mm)
Mobile phase: 70% MeOH/30% H_2O
Temperature: 30 °C
Detection: UV 254 nm
Test compound: naphthalene
Injection: 5 µL

Characteristics

- Most comprehensive selection of the stationary phases
- Highly controlled chemistry of monolayer formation and end-capping
- High column-to-column reproducibility
- High mechanical stability to resist the pressure as high as up to 10,000 psi
- High resolution, efficiency and selectivity for separations
- Suitable for separations of acidic, neutral and basic compounds, peptides, and proteins

Applications

- UHPLC separations
- Pharmaceuticals
- Peptides
- Proteins

Sepax sub-2 µm particles and columns can work well with both regular HPLC and UHPLC systems. Figure 2 shows an example of separation of a mixture of test compounds. The flow rate is 0.43 mL/min, generating 3060 psi for a 2.2 µm GP-C18 (3.0x150 mm) column. The flow rate was not optimized to reach minimum reduced plate height. However, it showed high separation efficiency and selectivity.

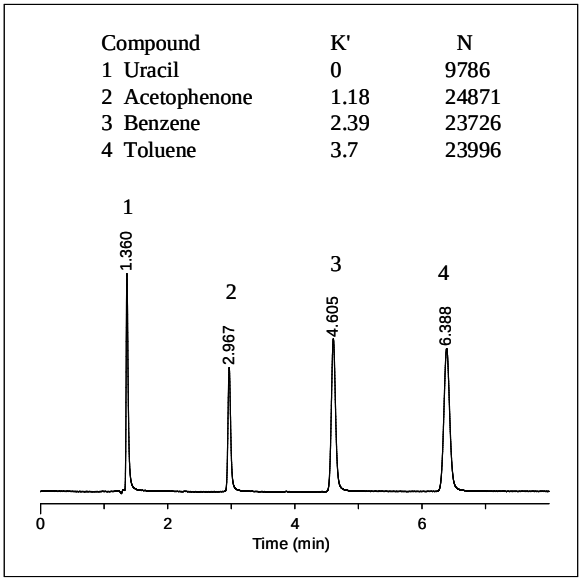


Figure 2. Separation of a mixture by regular HPLC system. Column: GP-C18 (2.2µm, 3.0x150mm). Mobile phase: 60% Acetonitrile/40% H_2O, 0.43 mL/min. Temperature: ambient. Detection: UV 254 nm. Injection: 2 µL.

Separation of a mixture of neutral and basic compounds

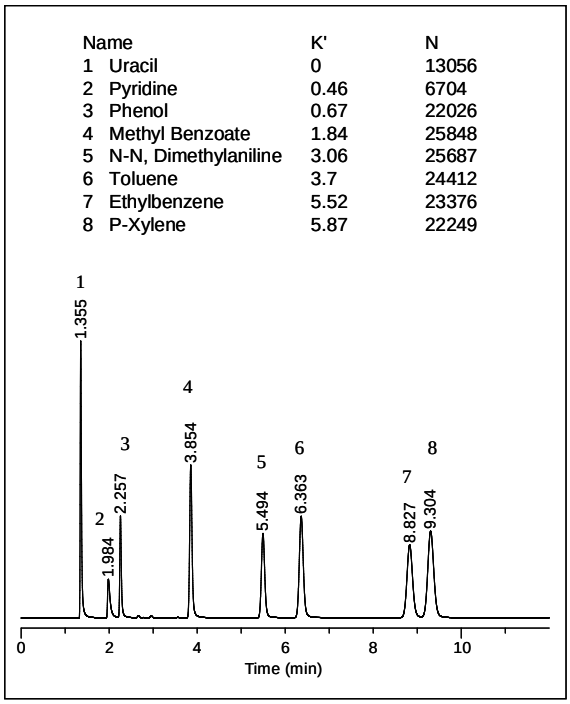


Figure 3. Separation of a mixture by regular HPLC system. Column: GP-C18 (2.2µm, 3.0x150mm). Mobile phase: 60% Acetonitrile/40% H_2O, 0.43 mL/min. Temperature: ambient. Detection: UV 254 nm. Injection: 2 µL.

Separation of barbitals

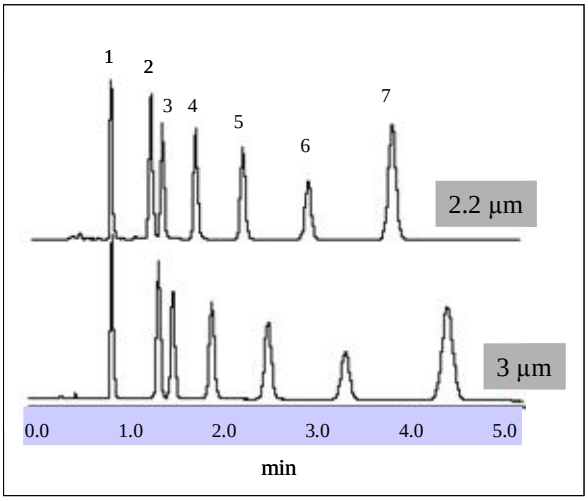


Figure 4. Barbitals separated by a 2.2 µm GP-C18 column and a 3 µm commercial C18 column with regular HPLC system. Columns: 4.6x50 mm. Mobile phase: 50% MeOH/50% H_2O. Flow rate: 1.0 mL/min. Temperature: 30°C. Detection: UV 214 nm. Injection: 3 µL. Sample: 1. barbital, 2. phenobarbital, 3. aprobarbital, 4. butabarbital, 5. mephobarbital, 6. pentobarbital, and 7. secobarbital.

Separation of Vitamin D Isomers

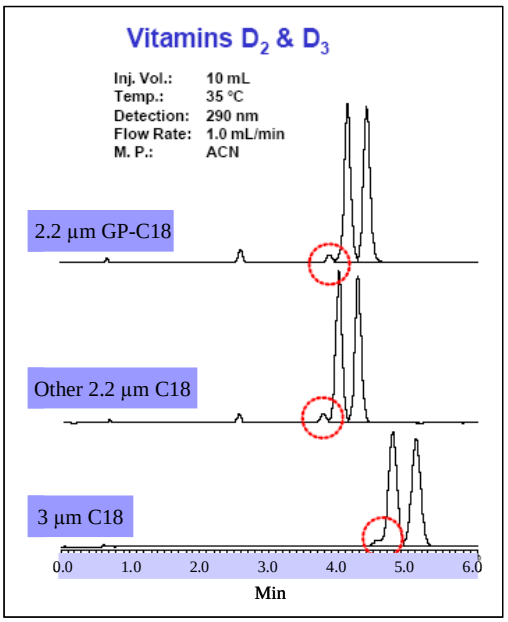


Figure 5. Vitamin D2 and D3 separated by a Sepax 2.2 µm GP-C18 column, a 2.2 µm and a 3 µm C18 columns from other vendors. Columns: 4.6x50 mm. Injection: 3 µL.

Separation of Caffein & Metabolites

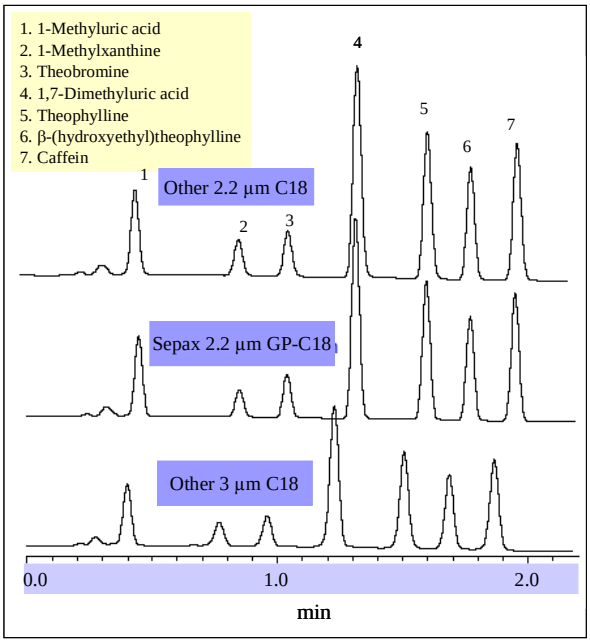
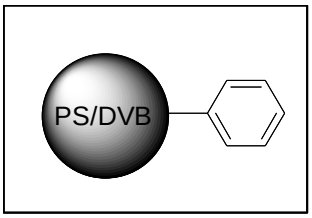


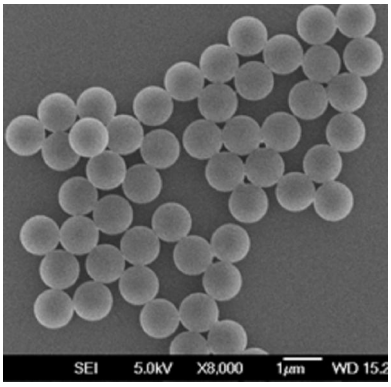
Figure 6. Caffein and metabolites separated by a Sepax 2.2 µm GP-C18 column, a 2.2 µm and a 3 µm C18 columns from other vendors. Columns: 4.6x50mm. Mobile phase A: 0.1% NH_4OAc, pH 4.5; B: ACN. Gradient: 98%-93%-85%-85%A (0-0.75-1.50-2.25min). Flow rate: 3.0 mL/min. Temperature: 30°C. Detection: UV 275nm. Injection: 5 µL.

PolyRP Phases



Specifications

PS/DVB Particles: spherical, 80% cross-linking
Pore size: non-porous
Particle size: 1.0, 1.8 µm
Surface area: <10 m^2/g
Phase structure: phenyl group
Separation mechanism: hydrophobic interaction



Description

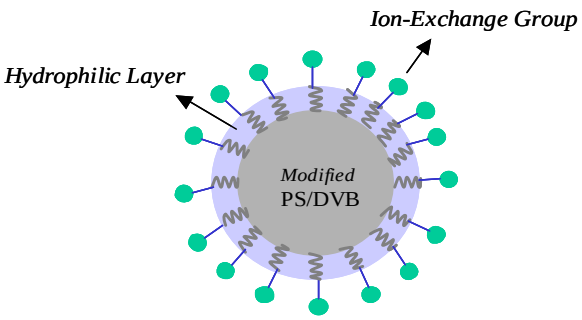
PolyRP phases are made of 80% cross-linking PS/DVB spherical particles. Those high rigid particles have both non-porous and porous structures with the particle selection of 1 and 1.8 µm. The phase structure is phenyl functional group that enables hydrophobic interaction. Compared with silica based reversed phases, PolyRP phases have advantages over applications at extreme pH (1-14) with special selectivity and slightly lower separation efficiency.

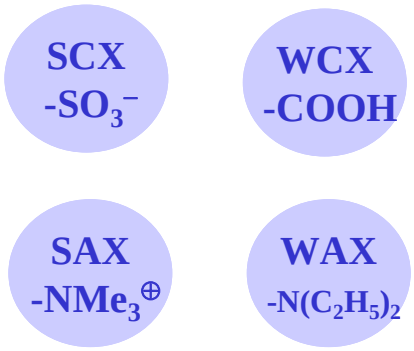
Characteristics

- High resolution and efficiency
- Different selectivity as the silica based reversed phases
- High column-to-column reproducibility
- Unique PolyRP reversed phases for pH 1-14
- High mechanical stability to resist the pressure as high as up to 10,000 psi
- Suitable for separations of acidic, neutral and basic compounds, peptides, and proteins

Proteomix Ion-exchange phases

Stationary phases





Specifications

Proteomix Phases	Particle size (µm)	Pore size	Functional Group	Dynamic loading capacity	pH range
SCX-NP	1.8	Non-porous	Sulfonate	65 mg/mL	2-12
WCX-NP	1.8	Non-porous	Carboxylate	25 mg/mL	2-12
SAX-NP	1.8	Non-porous	Quaternary ammonium	43 mg/mL	2-12
WAX-NP	1.8	Non-porous	Tertiary amine	35 mg/mL	2-12

Description

Proteomix ion-exchange phases have been innovatively developed for achieving high ion-exchange capacity, a breakthrough technology for non-porous resins. Proteomix packing support is composed of a rigid, spherical, highly cross-linked poly(styrene divinylbenzene) (PS/DVB) non-porous bead. The PS/DVB resin surface is grafted with a highly hydrophilic, neutral polymer thin layer with the thickness in the range of nanometers, which shields the hydrophobic PS/DVB core and eliminates their non-specific bindings with biological analytes, leading to high efficiency and high recovery separations for biological molecules. On the top of the hydrophilic layer, ion-exchange functional groups are attached via a proprietary chemistry, resulting in high capacity ion-exchange layer.

Characteristics

- Pioneered high capacity sub-2 µm non-porous ion-exchange packings
- Unprecedented high efficiency and resolution
- High column-to-column reproducibility
- High mechanical stability to resist the pressure as high as up to 10,000 psi
- High speed, high recovery and high stability

Applications

The uniqueness of non-porous Proteomix ion-exchange phases is that they combine increased capacity and resolution with their intrinsic advantages of high efficiency and high separation speed. Proteomics ion-exchange phases are especially suitable for high resolution, high efficiency and high recovery separations of proteins, oligonucleotides, peptides, polysaccharides, cell lysates, nanoparticles and nanotubes.

- UHPLC separations
- Proteins
- DNA and oligonucleotides
- Peptides
- Carbohydrates
- Cell lysates

Separation of proteins

Extremely high efficiency separation of proteins was achieved by a 1.8 µm Proteomix WCX column, as shown in Figure 1.

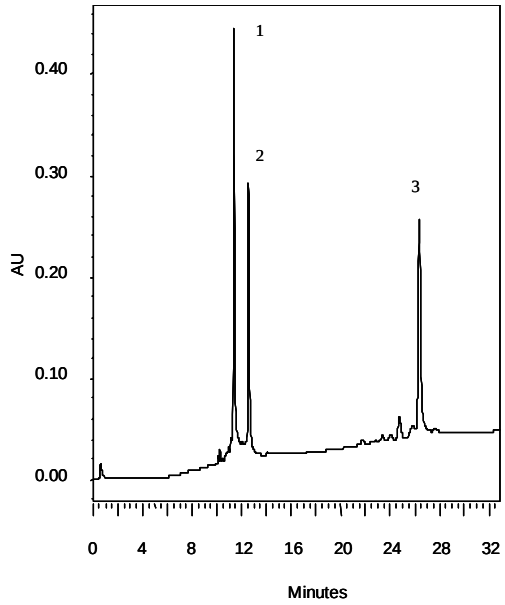


Figure 1. Separation of proteins by a Proteomix WCX-NP1.8 (1.8µm, 4.6x50mm). Mobile phase: (A) 10 mM phosphate, pH 6.0; (B) A + 1.0 M NaCl; 0-75%B in 25 min; Flow rate: 0.75 mL/min. Temperature: ambient. Detection: UV 280 nm. Sample: (1) Ribonuclese A, (2) Cytochrome C and (3) Lysozyme. Injection: 5 µL.

Separation of ovalbumin major components from its impurities by anionic exchange column

Ovalbumin from Sigma has two major components and a number of minor components or impurities. Resolution of those components is a good indication of the efficiency and resolving power of a column. A short Proteomix SAX-NP1.8 column (1.8µm, 4.6x30mm) very well resolved those components, as shown in Figure 2.

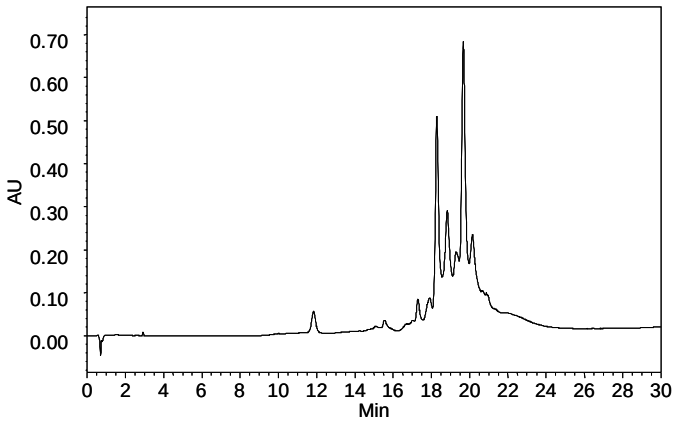


Figure 2. Separation of multiple components of ovalbumin by a Proteomix SAX-NP1.8 (1.8µm, 4.6x30mm). Mobile phases: (A) 20 mM Tris buffer, pH 8.0; (B) A + 0.5 M NaCl. Gradient: 0-75%-100%B (0-21-21.5min). Flow rate: 0.4 mL/min. Temperature: ambient. Backpressure: 1,800 psi. Detection: UV 214 nm. Injection: 5 µL (10 mg/mL of ovalbumin in H_2O).

Ordering Information

1.8 µm Reversed and Normal Phases (ID x length mm)						
Phases	2.1x30	2.1x50	2.1x100	2.1x150	3.0x30	3.0x50
GP-C18 (120 Å)	101181-2103	101181-2105	101181-2110	101181-2115	101181-3003	101181-3005
BR-C18 (120 Å)	102181-2103	102181-2105	102181-2110	102181-2115	102181-3003	102181-3005
GP-C8 (120 Å)	107081-2103	107081-2105	107081-2110	107081-2115	107081-3003	107081-3005
GP-C4 (120 Å)	109041-2103	109041-2105	109041-2110	109041-2115	109041-3003	109041-3005
GP-Phenyl (120 Å)	111361-2103	111361-2105	111361-2110	111361-2115	111361-3003	111361-3005
HP-CN (120 Å)	113311-2103	113311-2105	113311-2110	113311-2115	113311-3003	113311-3005
HP-NH_2 (120 Å)	115301-2103	115301-2105	115301-2110	115301-2115	115301-3003	115301-3005
HP-SCX (120 Å)	120361-2103	120361-2105	120361-2110	120361-2115	120361-3003	120361-3005
HP-Silica (120 Å)	117001-2103	117001-2105	117001-2110	117001-2115	117001-3003	117001-3005
HILIC Polar-100	131581-2103	131581-2105	131581-2110	131581-2115	131581-3003	131581-3005

1.8 µm Reversed and Normal Phases (ID x length mm)						
Phases	3.0x100	3.0x150	4.6x30	4.6x50	4.6x100	4.6x150
GP-C18 (120 Å)	101181-3010	101181-3015	101181-4603	101181-4605	101181-4610	101181-4615
GP-C18 (120 Å)	102181-3010	102181-3015	102181-4603	102181-4605	102181-4610	102181-4615
GP-C8 (120 Å)	107081-3010	107081-3015	107081-4603	107081-4605	107081-4610	107081-4615
GP-C4 (120 Å)	109041-3010	109041-3015	109041-4603	109041-4605	109041-4610	109041-4615
GP-Phenyl (120 Å)	111361-3010	111361-3015	111361-4603	111361-4605	111361-4610	111361-4615
HP-CN (120 Å)	113311-3010	113311-3015	113311-4603	113311-4605	113311-4610	113311-4615
HP-NH_2 (120 Å)	115301-3010	115301-3015	115301-4603	115301-4605	115301-4610	115301-4615
HP-SCX (120 Å)	120361-3010	120361-3015	120361-4603	120361-4605	120361-4610	120361-4615
HP-Silica (120 Å)	117001-3010	117001-3015	117001-4603	117001-4605	117001-4610	117001-4615
HILIC Polar-100	131581-3010	131581-3015	131581-4603	131581-4605	131581-4610	131581-4615

2.2 µm Reversed and Normal Phases (ID x length mm)						
Phases	2.1x30	2.1x50	2.1x100	2.1x150	3.0x30	3.0x50
GP-C18 (120 Å)	101182-2103	101182-2105	101182-2110	101182-2115	101182-3003	101182-3005
GP-C18 (120 Å)	102182-2103	102182-2105	102182-2110	102182-2115	102182-3003	102182-3005
GP-C8 (120 Å)	107082-2103	107082-2105	107082-2110	107082-2115	107082-3003	107082-3005
GP-C4 (120 Å)	109042-2103	109042-2105	109042-2110	109042-2115	109042-3003	109042-3005
GP-Phenyl (120 Å)	111362-2103	111362-2105	111362-2110	111362-2115	111362-3003	111362-3005
HP-CN (120 Å)	113312-2103	113312-2105	113312-2110	113312-2115	113312-3003	113312-3005
HP-NH_2 (120 Å)	115302-2103	115302-2105	115302-2110	115302-2115	115302-3003	115302-3005
HP-SCX (120 Å)	120362-2103	120362-2105	120362-2110	120362-2115	120362-3003	120362-3005
HP-Silica (120 Å)	117002-2103	117002-2105	117002-2110	117002-2115	117002-3003	117002-3005
HILIC Polar-100	131582-2103	131582-2105	131582-2110	131582-2115	131582-3003	131582-3005
Phases	3.0x100	3.0x150	4.6x30	4.6x50	4.6x100	4.6x150
GP-C18 (120 Å)	101182-3010	101182-3015	101182-4603	101182-4605	101182-4610	101182-4615
BR-C18 (120 Å)	102182-3010	102182-3015	102182-4603	102182-4605	102182-4610	102182-4615
GP-C8 (120 Å)	107082-3010	107082-3015	107082-4603	107082-4605	107082-4610	107082-4615
GP-C4 (120 Å)	109042-3010	109042-3015	109042-4603	109042-4605	109042-4610	109042-4615
GP-Phenyl (120 Å)	111362-3010	111362-3015	111362-4603	111362-4605	111362-4610	111362-4615
HP-CN (120 Å)	113312-3010	113312-3015	113312-4603	113312-4605	113312-4610	113312-4615
HP-NH_2 (120 Å)	115302-3010	115302-3015	115302-4603	115302-4605	115302-4610	115302-4615
HP-SCX (120 Å)	120362-3010	120362-3015	120362-4603	120362-4605	120362-4610	120362-4615
HP-Silica (120 Å)	117002-3010	117002-3015	117002-4603	117002-4605	117002-4610	117002-4615
HILIC Polar-100	131582-3010	131582-3015	131582-4603	131582-4605	131582-4610	131582-4615

1.8 µm PolyRP-NP phase (ID x length mm)						
Phases	2.1x30	2.1x50	2.1x100	2.1x150	3.0x30	3.0x50
PolyRP-NP1.8	262002-2103	262001-2105	262001-2110	262001-2115	262001-3003	262001-3005
Phases	3.0x100	3.0x150	4.6x30	4.6x50	4.6x100	4.6x150
PolyRP-NP1.8	262002-3010	262001-3015	262001-4603	262001-4605	262001-4610	262001-4615

1.8 µm Proteomix Ion-exchange phases (ID x length mm)						
Phases	2.1x30	2.1x50	2.1x100	2.1x150	3.0x30	3.0x50
SCX-NP1.8	401NP2-2103	401NP2-2105	401NP2-2110	401NP2-2115	401NP2-3003	401NP2-3005
WCX-NP1.8	402NP2-2103	402NP2-2105	402NP2-2110	402NP2-2115	402NP2-3003	402NP2-3005
SAX-NP1.8	403NP2-2103	403NP2-2105	403NP2-2110	403NP2-2115	403NP2-3003	403NP2-3005
WCX-NP1.8	404NP2-2103	404NP2-2105	404NP2-2110	404NP2-2115	404NP2-3003	404NP2-3005
Phases	3.0x100	3.0x150	4.6x30	4.6x50	4.6x100	4.6x150
SCX-NP1.8	401NP2-3010	401NP2-3015	401NP2-4603	401NP2-4605	401NP2-4610	401NP2-4615
WCX-NP1.8	402NP2-3010	402NP2-3015	402NP2-4603	402NP2-4605	402NP2-4610	402NP2-4615
SAX-NP1.8	403NP2-3010	403NP2-3015	403NP2-4603	403NP2-4605	403NP2-4610	403NP2-4615
WCX-NP1.8	404NP2-3010	404NP2-3015	404NP2-4603	404NP2-4605	404NP2-4610	404NP2-4615