Cole-Parmer®

Cole-Parmer 1.7 µm UHPLC Columns

UHPLC Columns

- Optimized for Ultra-High Pressure LC (UHPLC)
- Available in 8 different selectivities
- Operate at 1200 bar (18,000 psi)



Speed
Resolution
Selectivity
Sensitivity

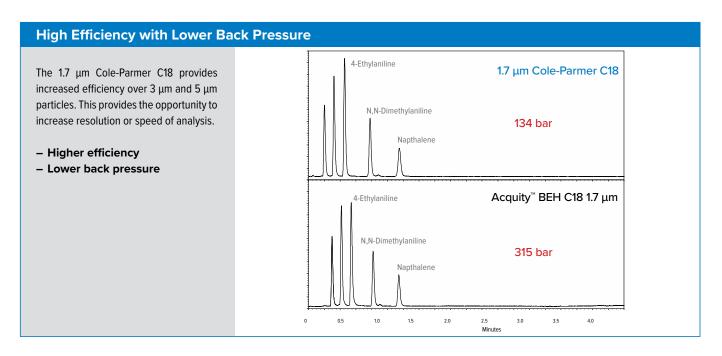
Phase Chemistry Selectivity

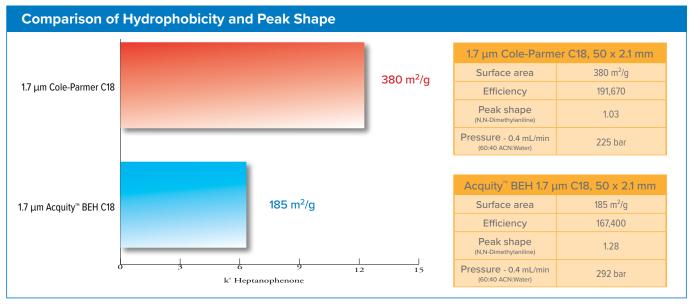
	C18 - General UHPLC use - Method development from pH 1–12	Acids Bases Neutrals
	Polar endcapped C18 - Polar endcapped - Increased polar retention	Hydrophilic analytes Organic acids Catecholamines
	Diphenyl - Unique diphenyl structure - Metabolite profiling - Separate positional isomers	Metabolites Positional isomers Hydrophilic / hydrophobic analytes
	C8 - General UHPLC use - Method development	Lipids Steroids Highly hydrophobic analytes
ОН	HILIC - High polar retention - Homogenous silanol concentration - Improve MS sensitivity	Carboxylic acids Nucleotides Vitamins
ОН	DIOL - Alternate selectivity to bare silica - Stable bonding - HILIC or normal phase mode	Steroids Proteins Metabolites
CN	Cyano - Cyano functionality - Reversed phase or normal phase	Explosives Pesticides Steroids
NH ₂	Amino - Reproducible, robust bonding - Reversed phase, normal phase or ion exchange mode	Saccarides Oligonucleotides Steroids

Cole-Parmer 1.7 µm UHPLC Columns

- Use 1.7 μm Cole-Parmer particles as a traditional UHPLC column or in place of core-shell
- 380 m²/g surface area for increased peak capacity
- Available in 8 phase chemistries
- Operate to 1200 bar (18,000 psi)
- Fully pH stable 1 to 12
- Fully scalable to analytical

The 1.7 μ m Cole-Parmer UHPLC columns can be used in UHPLC systems or in standard 400 to 600 bar systems to produce ultra-high pressure or ultra-high performance chromatography. The 1.7 μ m particles are designed to be robust, reproducible and fully scalable with 3 μ m and 5 μ m particles. They will operate up to 1200 bar (18,000 psi) providing increased efficiency at high linear velocities, allowing speed and sensitivity to be achieved on all the latest UHPLC systems. By choosing a high surface area UHPLC phase, the analyst can increase peak capacity using their existing column dimension, or maintain existing capacity while lowering back pressure on a shorter column.





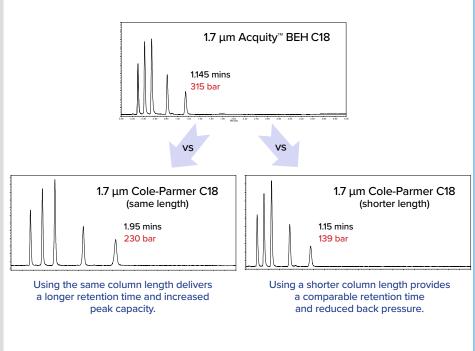
Acquity is a trademark of Waters Corporation. Cole-Parmer is not associated with this company. Comparative separations/results may not be representative of all applications. All columns are original manufacturers own.

Comparisons

Performance Comparison of 1.7 μm Cole-Parmer C18 vs 1.7 μm Acquity™ BEH C18

The high surface area of the silica 1.7 µm Cole-Parmer C18 gives you the choice to increase retention/resolution or to lower back pressure compared to other manufacturer's columns.

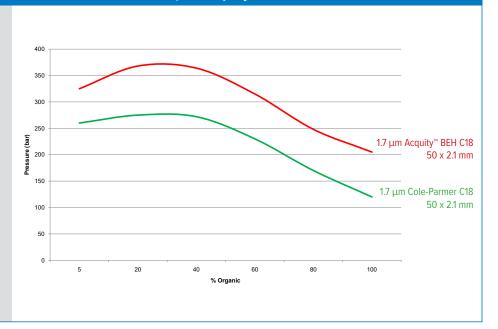
Increase peak capacity by using the same column length or use a shorter column to maintain the same retention while reducing back pressure.



Pressure Comparison of 1.7 μm Cole-Parmer C18 vs 1.7 μm Acquity™ BEH C18

The high surface area of the 1.7 μ m Cole-Parmer C18 provides less back pressure than many of other UHPLC columns on the market.

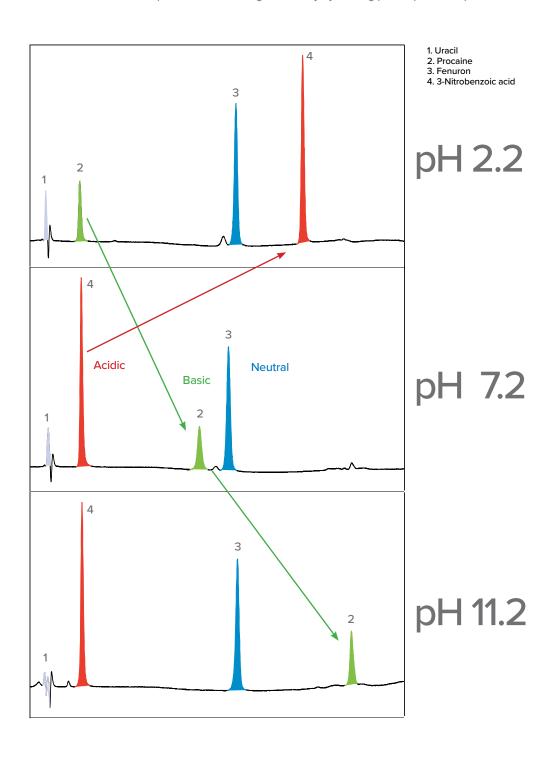
You can decide to use a shorter column that will reduce the pressure with no loss of separation.



1.7 µm Cole-Parmer C18 pH Options

- pH selectivity for method development
- pH stable 1 to 12
- Gives high speed of equilibration

The 1.7 µm Cole-Parmer C18 will operate across the pH spectrum giving the analyst the ability to optimize the correct pH region for their separation. Quickly equilibrating from formic acid to ammonium acetate through to ammonia allows pH, as a method variable, to be rapidly evaluated. Resolution of compounds can be changed radically by altering pH to optimize separation between compound classes.



Scalability and Sensitivity

Fully Scalable

All Cole-Parmer phases can be scaled from 1.7 μ m all the way through analytical 3 μ m and 5 μ m particles without any change in retention profile.

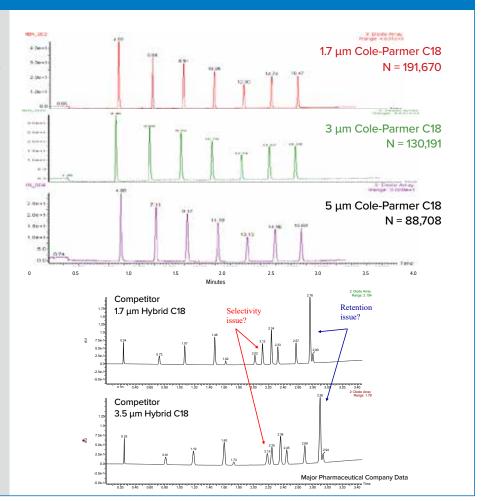
- Facilitate method transfer

Using columns of identical chemistry and by adjusting flow rate, injection volume and gradient scaling, scaling up or down is possible without change in selectivity, making it easy to transfer methods between laboratories.

Avoid changes in resolution and retention

If a small particle used in UHPLC is not the same as its larger 3 μm and 5 μm particle then changes in resolution and retention can occur, neither of which are acceptable in method validation.

The 1.7 μm Cole-Parmer C18 will alleviate all these potential issues, leaving the analyst confident in method transfer.



Sensitivity Gains

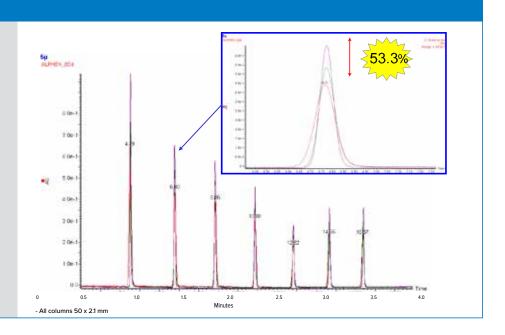
Peak height increases in UHPLC due to the rise in efficiency (N) from the smaller particle, but it is also inversely proportional to peak width, so symmetrical peaks will lead to increased sensitivity.

- Sharp Peak Shapes

All Cole-Parmer phases are designed to give the sharpest possible peak shapes.

- High Efficiency

Moving from 3 μ m to 1.7 μ m Cole-Parmer C18 gives a peak height increase of 27% in this example. The increase from 5 μ m particles is 53%.



UHPLC Method Development

The 1.7 µm Cole-Parmer columns will allow the transfer of methods from traditional HPLC to UHPLC, saving both time and solvent. If done properly the overall method time will be reduced but resolution and selectivity of solutes will remain constant or improve.

Equivalent UHPLC Column — 'Separating Power'

First consideration is the ability to scale the method down in column dimension, length and diameter:

- Equivalent UHPLC column

If you can retain equivalent column plate count or 'separating power' then it is much easier to scale down effectively.

- Example

If you move from a 5 μ m 150 x 4.6 mm to a 1.7 μ m 50 x 2.1 mm, the equivalent separation should be achieved but a several fold improvement in analysis time will be achieved.

Column length	Efficiency of 5 μm	Efficiency of 3 μm	Efficiency of 1.7 μm
250	22,000		
150	12,700	16,800	26,460
100	8,300	10,700	21,000
50	4,000	6,000	11,200
30		3,200	7,000
20			3,000

UHPLC Method Development



To scale to a UHPLC column, change the flow rate and injection volume in order to maintain the linear velocity across the method and not overload the column.

- Change flow rate

$$F_2 = F_1 \times (Dc_2 / Dc_1)^2$$

- Change injection volume

$$V_2 = V_1 \times \frac{(Dc_2^2 \times L_2)}{(Dc_1^2 \times L_1)}$$

 F_2 = New flow rate

F₁ = Original flow rate

Dc₂ = New column diameter

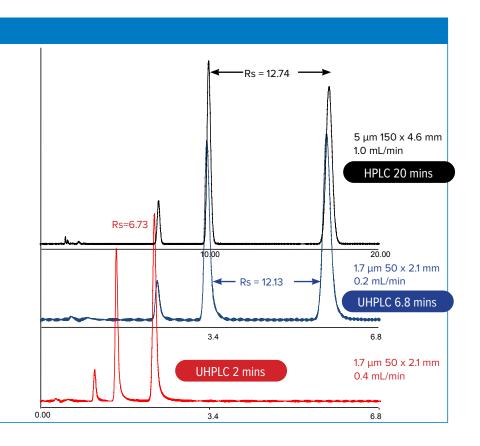
Dc₁ = Original column diameter

L₂ = Length of new column

 L_1 = Length of original column

V₂ = New injection volume

V₁ = Original injection volume



Scaling a Method — Gradient

In order to change our gradient, we must aim to keep the slope and the start point the same but lower the time the gradient runs in.

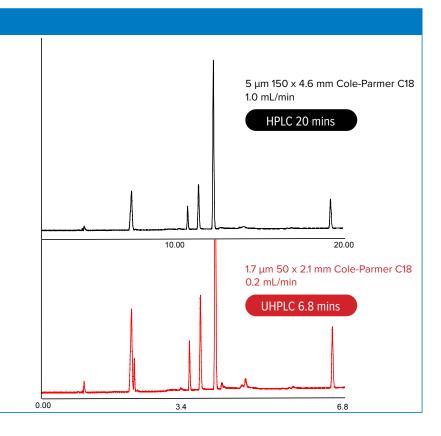
Altering the gradient time retains the same linear gradient and slope, but reduces the run time.

Change Gradient

$$tg_2 = tg_1 \times (F_1 / F_2) \times (Dc_2^2 / Dc_1^2) \times (L_1 / L_2)$$

tg₂ = New gradient time

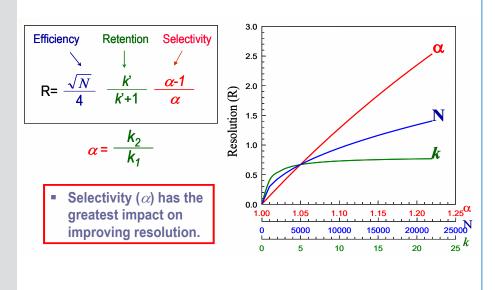
tg, = Original gradient time



UHPLC Method Development

Resolution vs Efficiency vs Selectivity

The 1.7 μ m Cole-Parmer C18 will provide hydrophobic selectivity which is suitable for many compounds. However as the resolution equation shows us having multiple phase chemistries available is a definite advantage even in UHPLC. Selectivity can then be used in conjunction with higher efficiency.

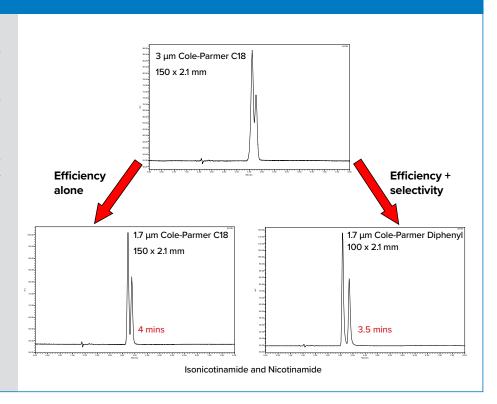


Improve Selectivity

To scale a method, efficiency alone can't provide the necessary resolution.

Scaling from 3 μm to 1.7 μm does not provide baseline resolution between the compounds.

Selecting an alternative phase chemistry may be needed to achieve faster separation on a shorter column and achieve full baseline separation.



UHPLC In-Line Filters



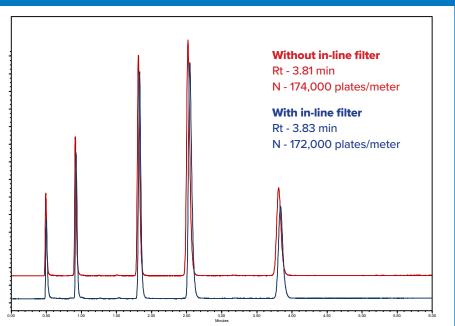
- Low volume in-line filters for all UHPLC columns
- No back pressure increase
- Increase lifetime of UHPLC columns
- Change-over time in seconds not minutes

Column Protection — No Loss in Performance

Cole-Parmer UHPLC in-line filters are direct connect design, fitting in between the UHPLC column and the conventional system fitting to filter out particulate matter.

In-line filters are ideal for 1.7 μ m UHPLC columns where extra packed bed from a guard would be detrimental.

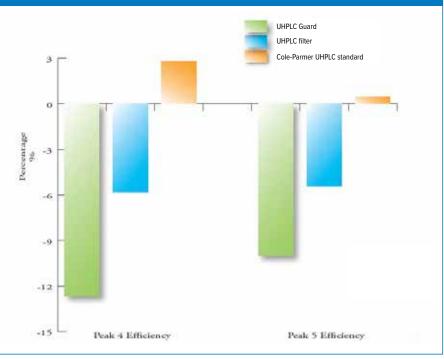
UHPLC in-line filters are manufactured to withstand 1379 bar (20,000 psi).



Column Protection — No Loss in Performance

In-line filters are more suitable to many instances of UHPLC since with very short run times guard columns will add retention that is not required. Guards can also reduce the efficiency of the system.

All in-line filters are not the same and some filters may affect both efficiency and peak shape. Cole-Parmer in-line filters are optimized for UHPLC.



Ordering Information

Phase Characteristics

Chemistry	C18	Polar endcapped C18	Diphenyl	C8	HILIC	DIOL	Cyano	Amino
Carbon loading	17%	18%	13%	13%	N/A	4%	7%	5%
Particle size	1.7 µm	1.7 μm	1.7 μm	1.7 μm	1.7 µm	1.7 μm	1.7 μm	1.7 µm
Specific area	380 m²/g	380 m²/g	380 m²/g	380 m²/g	380 m²/g	380 m²/g	380 m²/g	380 m²/g
Pore size	100 Å	100 Å	100 Å	100 Å	100 Å	100 Å	100 Å	100 Å
pH range	1 to 12	2 to 10	2 to 9	2 to 10	2 to 8	2 to 8	2 to 7	2 to 8
USP classification	L1	L1	L11	L7	L3	L20	L10	L8

UHPLC Columns



				C18	Polar end- capped C18	Diphenyl	C8	HILIC	DIOL	Cyano	Amino
Particle size	Length	Column ID	Qty	Item number	Item number	Item number	Item number	Item number	Item number	Item number	Item number
	50 mm	2.1 mm	1	16470-12	16470-54	16471-33	16470-33	16471-96	16471-75	16471-12	16471-54
17	50 11111	4.6 mm	1	16470-09	16470-51	16471-30	16470-30	16471-93	16471-72	16471-09	16471-51
1.7 μm	100 mm	2.1 mm	1	16470-11	16470-53	16471-32	16470-32	16471-95	16471-74	16471-11	16471-53
	150 mm	2.1 mm	1	16470-10	16470-52	16471-31	16470-31	16471-94	16471-73	16471-10	16471-52

In-Line Filters

- Maintain chromatographic integrity and increase column lifetime
- Low-volume in-line filters change out in seconds, not minutes
- Place between column and fitting—no back pressure increase
- Fingertight direct connection



Description	Qty	Item number
la lia a filha na fan I II IDI C a alumana O F uma	2	16470-92
In-line filters for UHPLC columns, 0.5 μm	4	16470-93

Applications

Compound	Use	Column
1-Hydroxy-midazolam	Anxiolytic	C18
11 a-Hydroxyprogester- one	Steroid	Polar endcapped C18
11 a-Hydroxyprogester- one	Steroid	Cyano
17 a-Hydroxyproges- terone	Steroid	Polar endcapped C18
17-Hydroxyprogesterone	Hormone	C18
2,4-D	Herbicide	Cyano
2,4-DB	Herbicide	Cyano
2,4-DCP	Herbicide	C18
2,4-DP	Herbicide	Cyano
2,6-Dinitrotoluene	Explosives	Cyano
2-Hydroxybenzoic acid	Positional isomers	Diphenyl
2-Hydroxyestradiol	Positional isomers	Diphenyl
2-Nitroaniline	Explosives	Cyano
3-Hydroxyanabsinthin	Sesquiterpene lactones	C18
3-Hydroxybenzoic acid	Positional isomers	Diphenyl
3-Methoxytyramine	Catecholamine	HILIC
3-Nitrobenzoic acid		C18
3-Octanon	Fragrance	C18
4-Ethylaniline		C18
4-Hydroxybenzoic acid	Positional isomers	Diphenyl
4-Hydroxyestradiol	Positional isomers	Diphenyl
4-Nitroaniline	Explosives	Cyano
5-HIAA	Catecholamines	Polar endcapped C18
6-Monacetylmorphine	Drugs of abuse	C18
7-Aminoclonazepam	Hypnotic	C18
7-Aminoflunitrazepam	Benzodiazepines	C18
7-Aminonitrazepam	Anxiolytic	C18
Absinthin	Sesquiterpene lactones	C18
Acetaminophen	Flu relief	C18
Acetic acid	Ear infections	C18
Adenine	Polars	HILIC
ALA	Amino acids	C18
Aldehydes	Aldehydes	C18
Alprazolam	Anxiolytic	C18
Amiloride	Diuretic	C18
Amitriptyline	Antidepressant	C18
Amoxicillin	Antibiotic	C18
Amphetamine	Drugs of abuse	C18
Amprenavir	HIV drugs	C18
Anabsin	Sesquiterpene lactones	C18
Anabsinthin	Sesquiterpene lactones	C18
Apigenin	Natural dyes	C18
ARG	Amino acids	C18
Artemisetin	Sesquiterpene lactones	C18

Ascisic acid Plant hormone C18 Ascorbic acid Vitamins HILIC ASP Amino acids C18 Atazanavir HIV drugs C18 Atenolol Beta blocker Polar endcapped C18 Atorvastatin Statins C18 Azithromycin Antibiotic C18
ASP Amino acids C18 Atazanavir HIV drugs C18 Atenolol Beta blocker Polar endcapped C18 Atorvastatin Statins C18
ASP Amino acids C18 Atazanavir HIV drugs C18 Atenolol Beta blocker Polar endcapped C18 Atorvastatin Statins C18
Atenolol Beta blocker Polar endcapped C18 Atorvastatin Statins C18
Atenolol Beta blocker Polar endcapped C18 Atorvastatin Statins C18
Azithromycin Antibiotic C18
Banvel Herbicide C18
Bendroflumethiazide Thiazide diuretic Polar endcapped C18
Benoquinone acetic Polar endcapped acid C18
Benzene Alkyl benzenes C18
Benzoylecgonine Drugs of abuse C18
Benzyladenine Plant hormone C18
Bromazepam Benzodiazepines C18
Butylbenzene Alkyl benzenes C18
Campher Fragrance C18
Candesartan cilexetil Hypertension C18
Cefachlor Antibiotic C18
Cefadroxil Antibiotic C18
Cefalexin Antibiotic C18
Cefradine Antibiotic C18
Chloramphenicol Antibiotic Polar endcapped C18
Cineol Fragrance C18
Ciprofloxacin Antibiotic Diphenyl
Citalopram Antidepressant C18
Clonaepam Hypnotic C18
Clopidogrel hydrogen SO ₄ Antiplatelet C8
Clozapine Drugs of abuse C18
CMPP Herbicide Cyano
Co-amoxiclav Antibiotic C18
Co-codamol Pain relief C18
Cortisone Anti-inflammatory C18
CYS-CYS Amino acids C18
Cytosine Nuclosides HILIC
D3-Digitoxin Cardiac glycosides C18
Dalbavancin Antibiotic Diphenyl
Demoxepam Benzodiazepines C18
Desmethyldiazepam Anxiolytic C18
Dexamethasone Ear infections C18
Diamorphine Opioid analgesic Polar endcapped C18
Dianette Alkaloid C18
Diazepam Anti anxiety C18

Applications

Compound	Use	Column
Diclofenac sodium	Painkiller	C18
Diethylaniline		C18
Digitoxin	Cardiac glycosides	C18
Dihydroquinidine	Antiarrhythmic	Diphenyl
Diltiazem	High blood pressure	Polar endcapped C18
Dimethylaniline		C18
Diphenhydramine	Antihistamine	C18
D-metafetamine	Drugs of abuse	C18
DOPAC	Catecholamines	Polar endcapped C18
Dopamine	Catecholamine	HILIC
Doxazosin	Apha blocker	Diphenyl
Entecavir	Antiviral	Diphenyl
Epinephrine	Catecholamine	HILIC
Epiyangambin	Sesquiterpene lactones	C18
Erythromycin	Erythromycin	HILIC
Estradiols	Estradiols	C18
Fenuron		C18
Flucloxacillin	Antibiotic	C18
Flunitrazepam	Anxiolytic	C18
Fluoruracil	Polars	HILIC
Fluoxetine	Antidepressant	C18
Folic acid	Vitamin	Polar endcapped C18
Fructose	Monosaccharide	Amino
Gabapentin	Epilepsy	C18
Gibberellin acid	Plant hormone	C18
Gliclazide	Diabetes	C18
GLU	Amino acids	C18
Glucose	Monosaccharide	Amino
GLY	Amino acids	C18
Guanosine	Nuclosides	HILIC
Haloperidol	Antipsychotic	C18
Heptylbenzene	Alkyl benzenes	C18
Hexylbenzene	Alkyl benzenes	C18
HIS	Amino acids	C18
Homogentisic acid		Polar endcapped C18
Hydroxy-21-acetate	Steroid	Cyano
Hydroxyphenylacetic acid		Polar endcapped C18
Hydroxyphenylpyruvic acid		Polar endcapped C18
Hydroxytisone-21-ac- etate	Steroid	Polar endcapped C18
Ibuprofen	Painkiller	C18
ILE	Amino acids	C18
Indol-3-yl-acetate	Plant hormone	C18

Compound	Use	Column
Irbesartan	Angiotensin II antagonist	C18
Isoascorbic acid	Vitamins	HILIC
Isonicatinamide	Positional isomers	Diphenyl
Ketopelenolide	Sesquiterpene lactones	C18
Kinetin	Plant hormone	C18
Lactose	Disaccharide	Amino
Lamotrigine	Epilepsy	C8
Lanalool	Fragrance	C18
Lanandulyl acetate		C18
Lansoprazole	Stomach ulcers	C18
Lavandulol		C18
LEU	Amino acids	C18
Levocetirizine	Antihistamine	Polar endcapped C18
Lidocaine	Irregular heartbeats	C18
Limonen	Fragrance	C18
Linalyl acetate	Fragrance	C18
Lopinavir	HIV drugs	C18
Loratadine	Antihistamine	C18
Lorazepam	Anti anxiety	Diphenyl
LSD	Drugs of abuse	C18
Luteolin	Natural dyes	C18
LYS	Amino acids	C18
Maltose	Disaccharide	Amino
MCPA	Agrochemicals	C18
МСРВ	Weed control	Cyano
MDA	Drugs of abuse	C18
MDEA	Drugs of abuse	C18
MDMA (Ecstasy)	Drugs of abuse	C18
Melamine		HILIC
MET	Amino acids	C18
Metanephrine	Catecholamine	HILIC
Methamphetamine	Drugs of abuse	C18
Methyl melonic acid	Organic acids	Polar endcapped C18
Methylbenzoate		C18
Midazolam	Anxiolytic	C18
Mirtazapine	Antidepressant	C18
Morphine	Drugs of abuse	C18
N,N-Dimethylaniline	QC test	C18
Naphthalene	QC test	C18
Nelfinavir	HIV drugs	C18
Neomycin sulphate	Ear Infections	C18
Nicotinamide	Positional isomers	Diphenyl
Nicotinic acid	Vitamins	HILIC
Nitosininone		Polar endcapped C18

Applications

Nitrazepam Anxiolytic C18 Nitrobenzene Explosives Cyano Nordiazepam Drugs of abuse C18 Normetanephrine Catecholamine HILLC Norpinephrine Catecholamine HILLC Nortriptyline Tricyclic antidepressants C18 OH-Dalbavancin Antibiotic Diphenyl Omeprazole Stomach ulcers C18 Oseltamivir Antiviral C18 Oxazepam Hypnotic C18 PAH 16 PAH EPA C18 PAH 16 PAH EPA C18 Paracetamol Flu relief C18 Paracetamol Flu relief C18 Paracetamol Pilu relief C18 Perocc Weed control Cyano Pettylbenzene Alkyl benzenes C18 Pettylbenzene Alkyl benzenes C18 Pettides KFDA 83 - 59 pesticides C18 Phenylephrine Flu relief C18 Pheophorbide F	Compound	Use	Column
Nordiazepam Drugs of abuse C18 Normetanephrine Catecholamine HILLC Norpinephrine Catecholamine HILLC Norpinephrine Tricyclic antidepressants C18 OH-Dalbavancin Antibiotic Diphenyl Omeprazole Stomach ulcers C18 Oseltamivir Antiviral C18 Oxazepam Hypnotic C18 PAH 16 PAH EPA C18 Paracetamol Flu relief C18 Paroxetine Antidepressant Polar endcapped C18 Petticides KFDA 83 - 59 pesticides C18 Phenylephrine Flu relief C18 Phenylephrine Flu relief C18 Phenylephrine Flu relief C18 Pheophytin C18 Phetylbarzene Autiotic C18 Phetylbarzene Autiotic C18 Phetylbarzene Autiotic C18 Phenylephrine Flu relief C18 Pheophytin C18 Phetylbarzene Pet tracer Diphenyl PK11195 Dechlorinated PET tracer Diphenyl Prednisolone Steroid Polar endcapped C18 Procaine Annino acids C18 Progustine Propylbarzene Diphenyl Promethazine antipsychotics Progesterone Steroid Polar endcapped C18 Proguanil Anti-malarial Diphenyl Promethazine theoclate Nausea C18 Propylbenzene Alkyl benzenes C18 Pryrazoline C18 Pyrazoline C18 Pyrazoline C18 Pyrazoline C18 Pyrazoline Diphenyl Raloxifene glucoronides Treat osteoporosis C18 Riboflavin Vitamins HILLC Ribose Monosaccharide Amino	Nitrazepam	Anxiolytic	C18
Normetanephrine Catecholamine HILLC Norpinephrine Catecholamine HILLC Norpinephrine Catecholamine HILLC Nortriptyline Tricyclic antidepressants C18 OH-Dalbavancin Antibiotic Diphenyl Omeprazole Stomach ulcers C18 Oseltamivir Antiviral C18 Osazepam Hypnotic C18 PAH 16 PAH EPA C18 Paracetamol Flu relief C18 Paroxetine Antidepressant Polar endcapped C18 Pentylbenzene Alkyl benzenes C18 Pesticides KFDA 83 - 59 pesticides C18 Phenoxymethylpenicillin Antibiotic C18 Phenophytin Flu relief C18 Pheophorbide C18 Pheophorbide Flu relief C18 Pheophytin PET tracer Diphenyl PK11195 Dechlorinated PET tracer Diphenyl Prednisolone Steroid Polar endcapped C18 Prednisolone Steroid C18 Procaine Antibiotic C18 Procaine Antibiotic C18 Procaine Antievate C18 Procaine Antievate C18 Procaine Antievate C18 Progesterone Steroid Polar endcapped C18 Proguanil Anti-malarial Diphenyl Promethazine theoclate Nausea C18 Propylbenzene Alkyl benzenes C18 Propylbenzene Antierpressant C18 Propylbenzene Alkyl benzenes C18 Propylbenzene Alkyl benz	Nitrobenzene	Explosives	Cyano
Norpinephrine Catecholamine HILLC Nortriptyline Tricyclic antidepressants OH-Dalbavancin Antibiotic Diphenyl Omeprazole Stomach ulcers C18 Oseltamivir Antiviral C18 PAH 16 PAH EPA C18 Paracetamol Flu relief C18 Paroxetine Alkyl benzenes C18 Pentylbenzene Alkyl benzenes C18 Phenophytin C18 Phenophytin C18 Phenophytin PET tracer Diphenyl Prednisone Steroid Polar endcapped C18 Procaine Anioacids C18 Procaine Anioacids C18 Procaine Steroid Polar endcapped C18 Procy Amino acids C18 Procy Amino acids C18 Procy Amino acids C18 Procy Amino acids C18 Procy Betticate Petrocaine C18 Procy Amino acids C18 Procy C18 Procy C18 Procy C18 Propulbenzene Alkyl benzenes C18 Propylbenzene Alkyl benzenes C18 Protriptyline Antidepressant C18 Protriptyline Antidepressant C18 Protriptyline Antidepressant C18 Protriptyline Antidepressant C18 Pryrazoline C18 Pryrazoline C18 Pryrazoline C18 Prictiptyline Antidepressant C18 Pryrazoline C18 Prictiptyline Antidepressant C18 Pryrazoline C18 Protriptyline C18 Protriptyline Antidepressant C18 Protriptyline Antidepressant C18 Pryrazoline C18 Prictiptyline C18 Prictiptyline Antidepressant C18 Protriptyline Antidepressant C18 Protriptyline C18 Protriptyline C18 Protriptyline C18 Protriptyline C18 Protriptyline Antidepressant C18 Protriptyline C18 P	Nordiazepam	Drugs of abuse	C18
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	Riboflavin	Vitamins	HILIC
Ritonavir HIV drugs C18	Ribose	Monosaccharide	Amino
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Zolpidem Hypnotic C18	Warfarin	Anticoagulant	• •
	Xylose	Monosaccharide	Amino
Zopiclone Hypnotic C18	Zolpidem	Hypnotic	C18
	Zopiclone	Hypnotic	C18

