

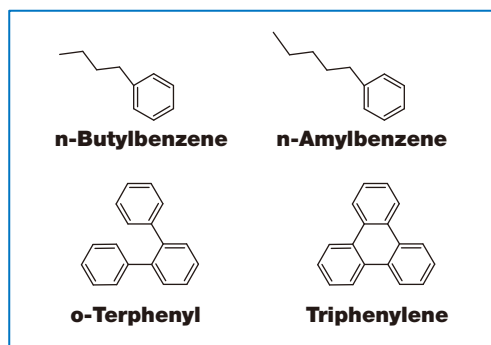
Comparison of Shodex Reversed Phase Chromatography (RPC) Column Features

ODS columns are the most popular reversed phase columns that are packed with silica-based octadecyl group. Shodex provides not only ODS columns but also polymer-based reversed phase columns with different functional groups. Please use following descriptions about the column features as guidelines to select suitable columns for your application purposes.

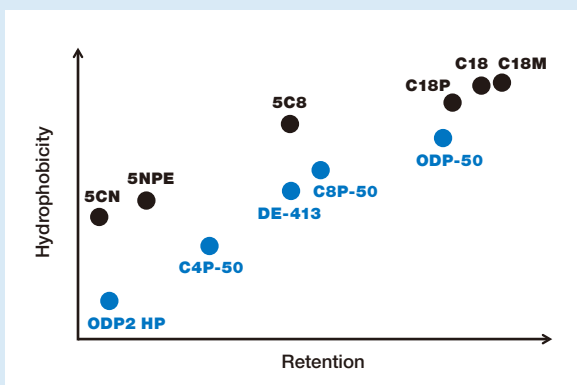
Features

ODP2 HP	<ul style="list-style-type: none">• Provides a large theoretical plate number nearly twice as much as generally available polymer-based reversed phase columns do• Offers enhanced retention of high polar substances compared to ODS columns• Suitable for the analysis of small molecules such as pharmaceuticals in the presence of protein matrix• Ideal for LC/MS analysis of high polar compounds• Fulfills USP L39 requirements
ODP-50	<ul style="list-style-type: none">• Relatively large pore size is suitable for the analysis of amino acids, peptides, and proteins
C8P-50	<ul style="list-style-type: none">• Usable in a wide pH range from pH 2 to 13
C4P-50	<ul style="list-style-type: none">• Usable in 100 % water and buffer solution• Best used for the analysis of basic substances• ODP-50 fulfills USP L67 requirements
ODP-40	<ul style="list-style-type: none">• Higher performance type of ODP-50 series• Fulfills USP L67 requirements
RP18-415	<ul style="list-style-type: none">• Large pore size is suitable for the analysis of proteins and peptides• Fulfills USP L21 requirements
DS-613	<ul style="list-style-type: none">• Suitable for reversed phase analysis of highly hydrophilic substances that are not well retained by ODS columns
DS-413	<ul style="list-style-type: none">• Fulfill USP L21 requirements
DE-613	<ul style="list-style-type: none">• General purpose polymer-based column having similar polarity as ODS columns
DE-413	<ul style="list-style-type: none">• Wide working pH range (from pH 2 to 12), usable in 100 % water and buffer solutions
DE-213	<ul style="list-style-type: none">• Fulfill USP L71 requirements
DM-614	<ul style="list-style-type: none">• Suitable for the analysis of amino acids and water-soluble vitamins• Fulfills USP L39 requirements
NN-814	<ul style="list-style-type: none">• The packing material modified with sulfo groups supports multimode (reversed phase and cation exchange) analysis
NN-614	<ul style="list-style-type: none">• Ideal for the analysis of complex samples containing neutral and ionic substances
NN-414	<ul style="list-style-type: none">• Ideal for the analysis of complex samples containing neutral and ionic substances
JJ-50	<ul style="list-style-type: none">• The packing material is modified with trace amounts of quaternary ammonium groups, and supports multimode (reversed phase and anion exchange) analysis• Ideal for analysis of complex samples containing neutral and ionic substances
C18	<ul style="list-style-type: none">• Fully end capped ODS column available at very reasonable price• Fulfills USP L1 requirements
C18M	<ul style="list-style-type: none">• Monomeric type ODS column, fully end capped high purity silica (99.99 % or higher)• Fulfills USP L1 requirements
C18P	<ul style="list-style-type: none">• Polymeric type ODS column, fully end capped high purity silica (99.99 % or higher)• Excellent acid tolerance• Advantageous for separating planar and nonplanar compounds from each other• Fulfills USP L1 requirements
New C18U	<ul style="list-style-type: none">• UHPLC column (Maximum pressure: 100 MPa)• Achieves high performance analysis with sub-2 μm particles• Organic/inorganic silica hybrid particles provide excellent resolution and mechanical stability and improved alkali durability (from pH 1 to 12)• Usable in 100 % water and buffer solution• Fulfills USP L1 requirements
5C8	<ul style="list-style-type: none">• Use when the retention capacity of C18 is too strong• Rapid mass transfer and fast equilibration allow its use as an ion-pair chromatography• Fulfills USP L7 requirements
5CN	<ul style="list-style-type: none">• Utilizes reversed phase interaction and π-electron interaction to separate regioisomers, which typically cannot be separated with ODS or C8 columns• Fulfills USP L10 requirements
5NPE	<ul style="list-style-type: none">• Utilizes several types of interactions based on π-electrons to separate structural isomers

The interrelation between hydrophobicity and retention, and the interrelation between steric selectivity and retention were compared among Shodex columns for reversed phase chromatography. The retention factor (k') of amylbenzene was used as the retention, the separation factor (α) between n-butylbenzene and n-amylbenzene was used as the hydrophobicity. The separation factor between o-terphenyl and triphenylene was used as the steric recognition. Larger separation factor means higher hydrophobicity and higher steric selectivity.

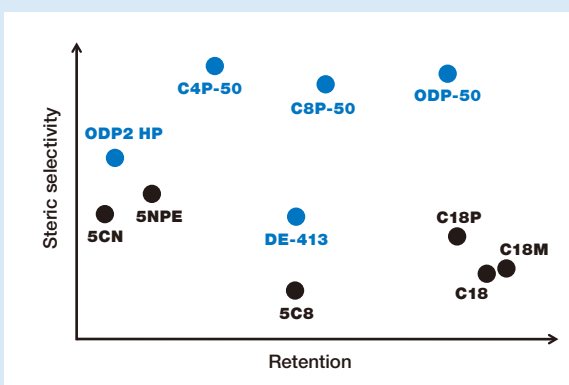


Hydrophobicity differences among Shodex RPCs



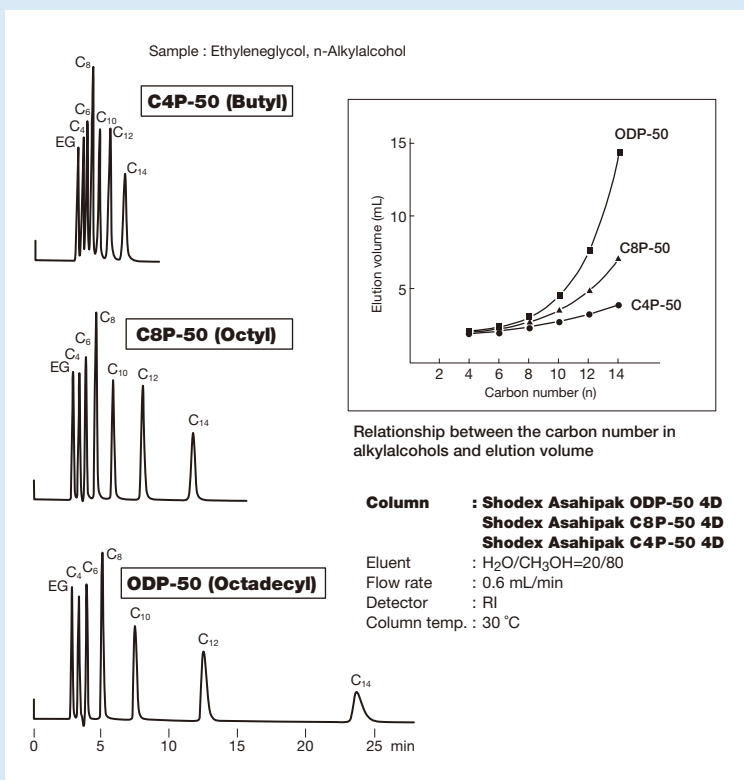
Column size : 4.6 mm I.D. x 150 mm each
 Eluent : H₂O/CH₃OH=20/80
 Flow rate : 1.0 mL/min
 Detector : UV (254 nm)
 Column temp. : 40 °C

Steric selectivity differences among Shodex RPCs

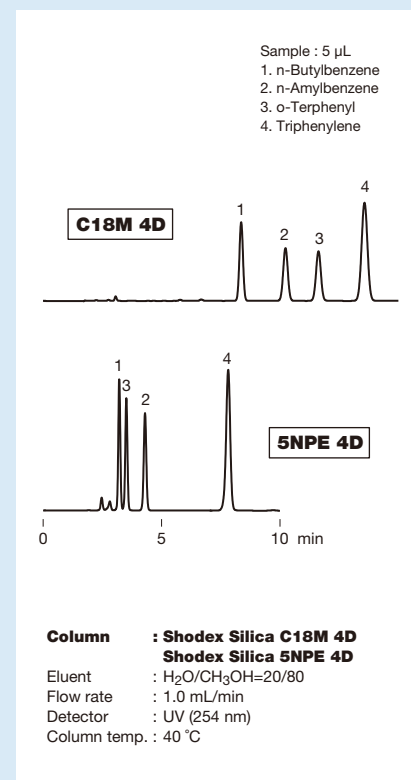


Column size : 4.6 mm I.D. x 150 mm each
 Eluent : H₂O/CH₃OH=20/80
 Flow rate : 1.0 mL/min
 Detector : UV (254 nm)
 Column temp. : 40 °C

Comparison of different functional groups on the separation of alkylalcohols



Effects of steric selectivity differences



Polymer-based Reversed Phase Chromatography Columns (Asahipak)

Please refer to “Comparison of Shodex Reversed Phase Chromatography (RPC) Column Features” on page 6 and 7 for features.

● Standard columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (μm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7621001	Asahipak ODP-40 4D	≥ 11,000	Octadecyl	4	250	4.6 x 150	H ₂ O/CH ₃ CN=35/65
F7621002	Asahipak ODP-40 4E	≥ 17,000	Octadecyl	4	250	4.6 x 250	H ₂ O/CH ₃ CN=35/65
F7620002	Asahipak ODP-50 6D	≥ 9,000	Octadecyl	5	250	6.0 x 150	H ₂ O/CH ₃ CN=35/65
F7620001	Asahipak ODP-50 6E	≥ 14,000	Octadecyl	5	250	6.0 x 250	H ₂ O/CH ₃ CN=35/65
F6710001	Asahipak ODP-50G 6A	(guard column)	Octadecyl	5	–	6.0 x 10	H ₂ O/CH ₃ CN=35/65
F6710023	Asahipak ODP-50 4B	≥ 2,500	Octadecyl	5	250	4.6 x 50	H ₂ O/CH ₃ CN=35/65
F7620004	Asahipak ODP-50 4D	≥ 9,000	Octadecyl	5	250	4.6 x 150	H ₂ O/CH ₃ CN=35/65
F7620003	Asahipak ODP-50 4E	≥ 14,000	Octadecyl	5	250	4.6 x 250	H ₂ O/CH ₃ CN=35/65
F6710022	Asahipak ODP-50G 4A	(guard column)	Octadecyl	5	–	4.6 x 10	H ₂ O/CH ₃ CN=35/65
F7620006	Asahipak C8P-50 4D	≥ 7,000	Octyl	5	250	4.6 x 150	H ₂ O/CH ₃ CN=35/65
F7620005	Asahipak C8P-50 4E	≥ 11,000	Octyl	5	250	4.6 x 250	H ₂ O/CH ₃ CN=35/65
F6710002	Asahipak C8P-50G 4A	(guard column)	Octyl	5	–	4.6 x 10	H ₂ O/CH ₃ CN=35/65
F7620008	Asahipak C4P-50 4D	≥ 6,000	Butyl	5	250	4.6 x 150	H ₂ O/CH ₃ CN=35/65
F7620007	Asahipak C4P-50 4E	≥ 9,000	Butyl	5	250	4.6 x 250	H ₂ O/CH ₃ CN=35/65
F6710003	Asahipak C4P-50G 4A	(guard column)	Butyl	5	–	4.6 x 10	H ₂ O/CH ₃ CN=35/65

Base Material: Polyvinyl alcohol

● Semi-micro columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (μm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7620009	Asahipak ODP-50 2D	≥ 5,000	Octadecyl	5	250	2.0 x 150	H ₂ O/CH ₃ CN=35/65
F6713001	Asahipak ODP-50G 2A	(guard column)	Octadecyl	5	–	2.0 x 10	H ₂ O/CH ₃ CN=35/65

Base Material: Polyvinyl alcohol

● Preparative columns [Preparative columns are made to order]

Product Code	Product Name	Plate Number (TP/column)	Particle Size (μm)	Column Size (mm) I.D. x Length	Standard Column
F6820001	Asahipak ODP-50 10E	≥ 10,000	5	10.0 x 250	ODP-40, ODP-50
F6820035	Asahipak ODP-90 20F	≥ 9,000	9	20.0 x 300	ODP-40, ODP-50
F6710004	Asahipak ODP-130G 7B	(guard column)	13	7.5 x 50	(guard column)

Base Material: Polyvinyl alcohol

