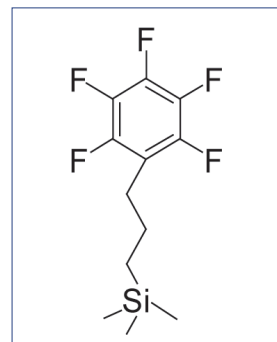




COSMOSIL

# High Performance Liquid Chromatography Column COSMOSIL 5PFP

- Pentafluorophenyl-bonded stationary phase
- Alternative selectivity to C<sub>18</sub> columns
- Available in analytical and preparative columns
- Suitable for structural isomers and halogenated compounds



Pentafluorophenyl Group

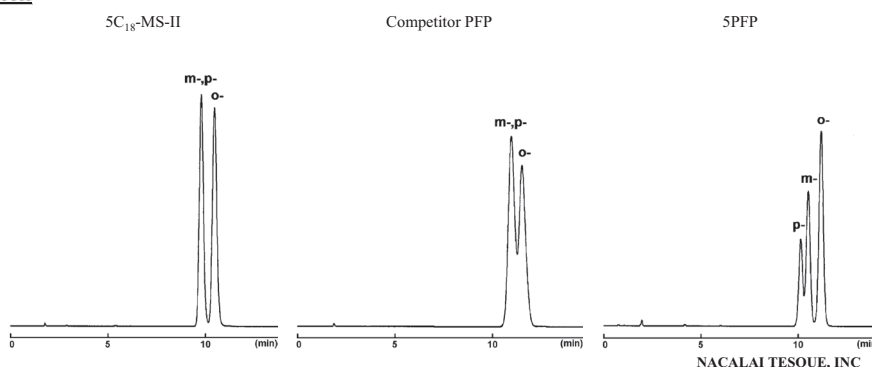
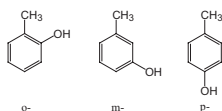
## Alternative Selectivity to C<sub>18</sub> Columns

COSMOSIL PFP provides different selectivity from C<sub>18</sub> Columns. Furthermore it offers improved separation compared to other companies' PFP columns.

### COSMOSIL Application Data

Column: 4.6mm I.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 40/60  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Cresol (3.0mg/ml)  
*m*-Cresol (3.0mg/ml)  
*p*-Cresol (3.0mg/ml)  
 Inj. Vol.: 1.0µl



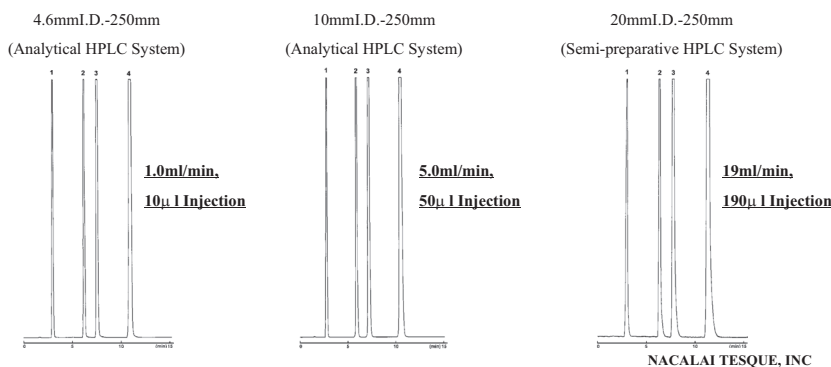
## Reasonably Priced Preparative Columns

We can offer preparative columns at a reasonable price because we synthesize our own silylating agents.

### COSMOSIL Application Data

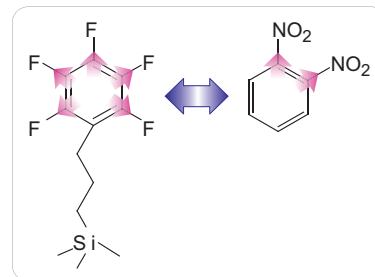
Column: 5PFP  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; Uracil  
 2; Methyl Benzoate  
 3; Toluene  
 4; Naphthalene



## Separation Properties of PFP

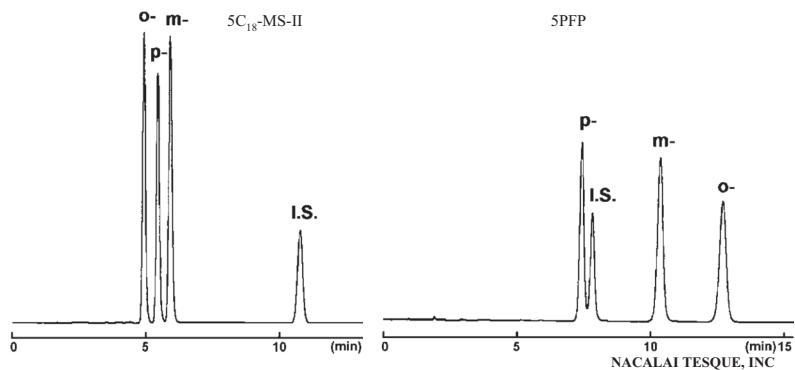
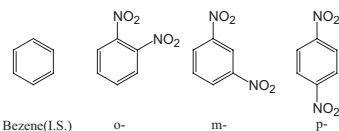
COSMOSIL PFP uses dipole-dipole and  $\pi$ - $\pi$  interactions. It offers strong retention for compounds with strong dipole moments, e.g. cationic or halogenated compounds. It also has high steric selectivity for structural isomer separations.



### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Dinitrobenzene  
*m*-Dinitrobenzene  
*p*-Dinitrobenzene  
 Benzene (I.S.)



## Applications

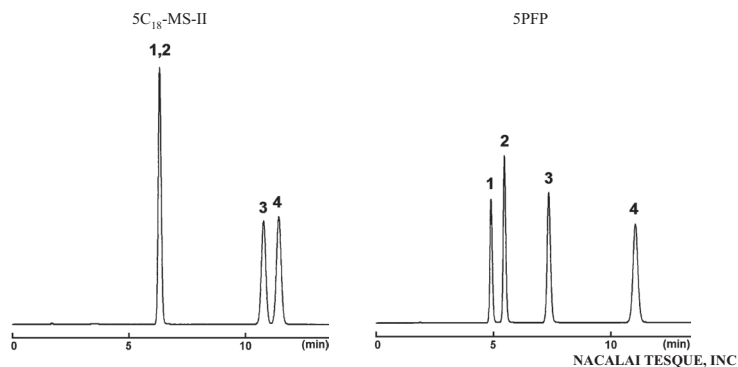
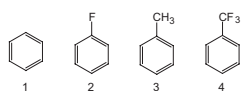
### Fluorinated compounds

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 60/40  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; Benzene (2.5mg/ml)  
 2; Fluorobenzene (1.0mg/ml)  
 3; Toluene (2.5mg/ml)  
 4;  $\alpha, \alpha, \alpha$ -Trifluorotoluene [Benzotrifluoride] (0.25mg/ml)

Inj. Vol.: 1.0  $\mu$ l

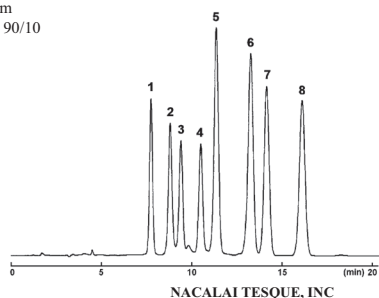


### Vitamin E

### COSMOSIL Application Data

Column: 5PFP  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV295nm

Sample: 1;  $\delta$ -Tocotrienol  
 2;  $\beta$ -Tocotrienol  
 3;  $\gamma$ -Tocotrienol  
 4;  $\alpha$ -Tocotrienol  
 5;  $\delta$ -Tocopherol  
 6;  $\beta$ -Tocopherol  
 7;  $\gamma$ -Tocopherol  
 8;  $\alpha$ -Tocopherol



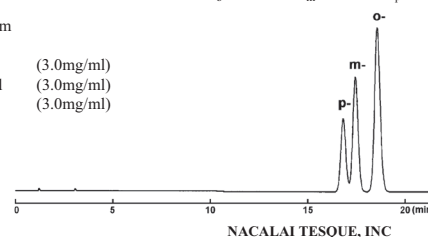
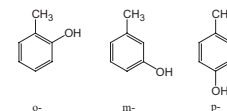
### Cresol Isomers

### COSMOSIL Application Data

Column: 5PFP  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 40/60  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Cresol (3.0mg/ml)  
*m*-Cresol (3.0mg/ml)  
*p*-Cresol (3.0mg/ml)

Inj. Vol.: 1.0  $\mu$ l



## Specialty Columns with Alternative Selectivity to C<sub>18</sub>

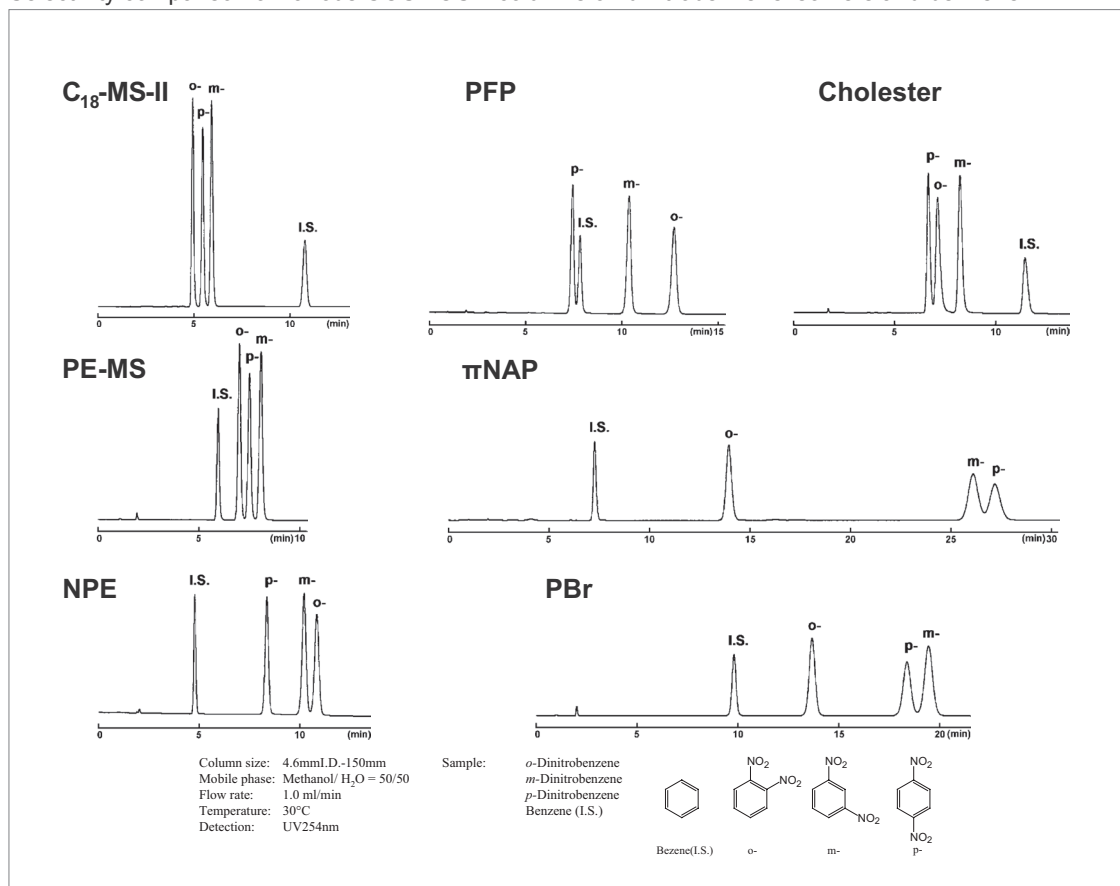
Nacalai Tesque offers the following specialty columns with alternative selectivity to C<sub>18</sub> columns.

### Reversed Phase Specialty Columns

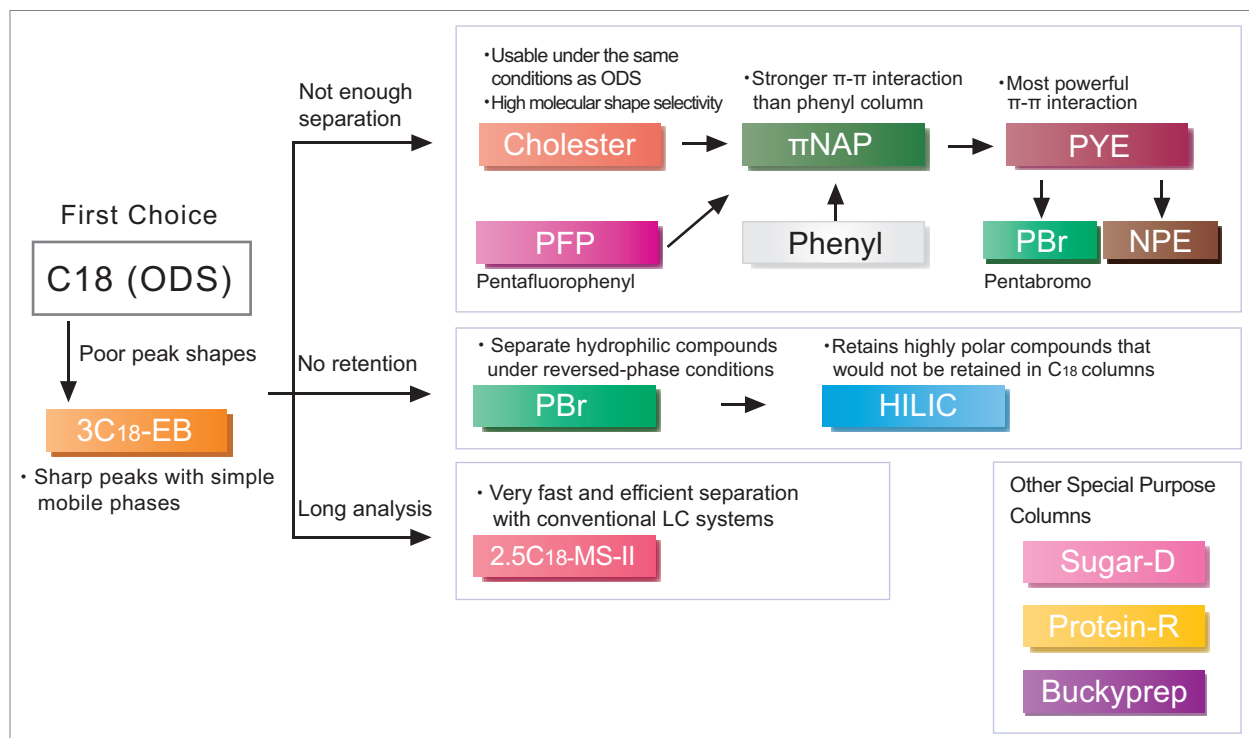
Product Name	PFP	Cholester	PE-MS	$\pi$ NAP	PYE	NPE	PBr
Stationary phase structure							
Stationary phase	Pentafluorophenyl group	Cholesteryl group	Phenylethyl group	Naphtylethyl group	Pyrenylethyl group	Nitrophenylethyl group	Pentabromobenzyl group
Main interactions	Hydrophobic interaction $\pi$ - $\pi$ interaction Dipole-dipole interaction	Hydrophobic interaction Molecular shape selectivity	Hydrophobic interaction $\pi$ - $\pi$ interaction	Hydrophobic interaction $\pi$ - $\pi$ interaction	Hydrophobic interaction $\pi$ - $\pi$ interaction Dispersion force Molecular shape selectivity	Hydrophobic interaction $\pi$ - $\pi$ interaction Dipole-dipole interaction	Hydrophobic interaction Dispersion force
Features	<ul style="list-style-type: none"> <li>Separation by dipole-dipole interactions.</li> </ul>	<ul style="list-style-type: none"> <li>Usable under the same conditions as C<sub>18</sub></li> <li>High molecular shape selectivity</li> </ul>	<ul style="list-style-type: none"> <li>Weak <math>\pi</math>-<math>\pi</math> interaction</li> </ul>	<ul style="list-style-type: none"> <li>Stronger <math>\pi</math>-<math>\pi</math> interaction than phenyl column</li> </ul>	<ul style="list-style-type: none"> <li>Strongest <math>\pi</math>-<math>\pi</math> interaction</li> </ul>	<ul style="list-style-type: none"> <li>Strong dipole-dipole Interaction</li> </ul>	<ul style="list-style-type: none"> <li>Separation by dispersion force</li> <li>Separate hydrophilic compounds in reversed phase conditions.</li> </ul>

## Selectivity to Dinitrobenzene Isomers

Selectivity comparison of various COSMOSIL columns on dinitrobenzene isomers and benzene



## COSMOSIL Column Selection Guide



## Specifications

Packing Material	5PFP
Silica gel	High-purity porous spherical silica
Average particle size	5 $\mu$ m
Average pore size	approx. 120 Å
Specific surface area	approx. 300 m <sup>2</sup> /g
Stationary phase	Pentafluorophenyl group
USP category	L43
Bonding type	Monomeric
Endcapping treatment	Yes
Carbon load	approx. 10%
Usable pH range	2–7.5

## Ordering Information

### • COSMOSIL 5PFP

Column Size I.D. x Length (mm)	Product Number	Column Size I.D. x Length (mm)	Product Number	Column Size I.D. x Length (mm)	Product Number
2.0 x 50	13263-41	10 x 50	13272-21	4.6 mm I.D. x 10 mm cartridge*	12443-24
2.0 x 100	13264-31	10 x 100	13273-11	10 x 20	12385-81
2.0 x 150	12381-21	10 x 150	13274-01	20 x 20	13275-91
2.0 x 250	13265-21	10 x 250	12386-71	4.6 mm I.D. Cartridge Holder	38009-79
3.0 x 50	13266-11	20 x 50	13276-81	*Cartridge Holder is required.	
3.0 x 100	13267-01	20 x 100	13277-71		
3.0 x 150	13268-91	20 x 150	13278-61		
3.0 x 250	13269-81	20 x 250	12387-61		
4.6 x 50	13270-41	28 x 100	13280-11		
4.6 x 100	13271-31	28 x 150	13281-01		
4.6 x 150	12383-01	28 x 250	13282-91		
4.6 x 250	12384-91				

For research use only, not intended for diagnostic or drug use.