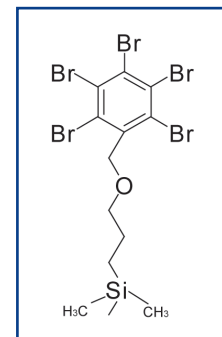




COSMOSIL

Pentabromobenzyl Group Bonded HPLC Column COSMOSIL PBr

- **Separate hydrophilic compounds in reversed-phase conditions**
- **Simple mobile phase condition compared to HILIC**
- **More sample loading capacity than HILIC**
- **Alternative selectivity to C₁₈ column**



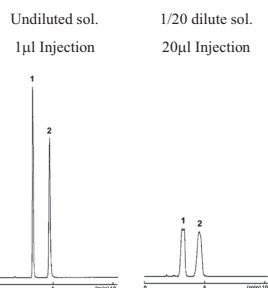
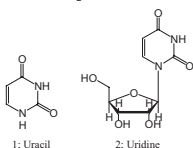
Separation of hydrophilic compounds in reversed-phase conditions

Hydrophilic interaction chromatography (HILIC) is an increasingly popular analytical technique. However, it is often difficult to develop a robust method due to users' less familiarity with HILIC conditions. Furthermore, high concentration of acetonitrile used in HILIC mobile phase makes it extremely sensitive to samples' water concentration; injecting samples in high water concentration often results in poor peak shapes. COSMOSIL PBr enables separation of hydrophilic compounds in reversed-phase conditions, maintaining sharp peak shapes even with aqueous samples.

COSMOSIL Application Data

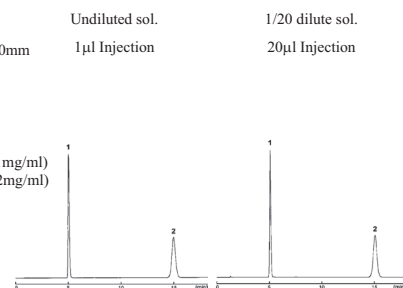
Column: HILIC
Column size: 4.6mm I.D.-150mm
Mobile phase: Acetonitrile/ H₂O = 90/10
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV260nm

Sample: 1; Uracil (0.1mg/ml)
2; Uridine (0.2mg/ml)
Sam. Solution H₂O



Column: PBr
Column size: 4.6mm I.D.-150mm
Mobile phase: H₂O
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV260nm

Sample: 1; Uracil (0.1mg/ml)
2; Uridine (0.2mg/ml)
Sam. Solution H₂O



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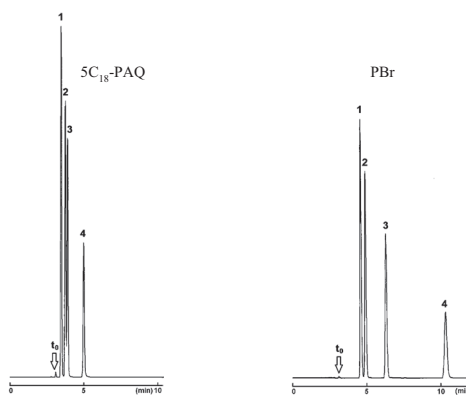
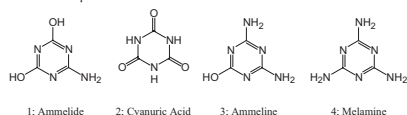
Comparison with C₁₈ Columns

COSMOSIL PBr retains hydrophilic compounds stronger than C₁₈ columns under the same reversed-phase conditions.

COSMOSIL Application Data

Column: 5C₁₈-PAQ
Column size: 4.6mm I.D.-250mm
Mobile phase: 20mmol/l Phosphate buffer(pH7.0)
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV225nm

Sample: 1; Ammelide (0.1mg/ml)
2; Cyanuric Acid (0.5mg/ml)
3; Ammeline (0.1mg/ml)
4; Melamine (0.1mg/ml)
Inj. Vol.: 1.0µl

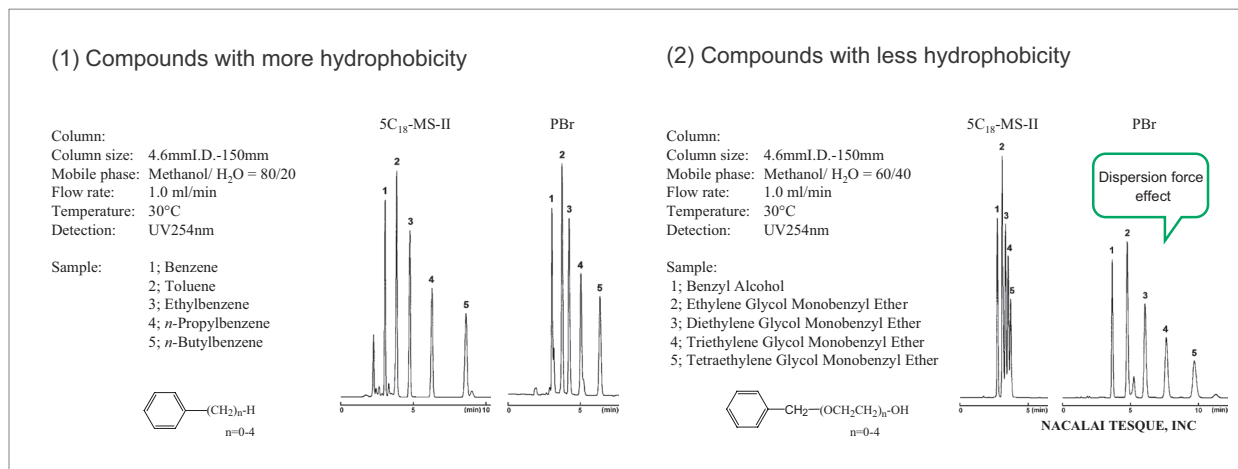


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T₀; Retention time of unretained peak

Separation Mechanism

In reversed-phase chromatography, compounds are separated by difference in hydrophobicity (the number of CH₂ bases, see chromatogram on the left (1)). Compounds with little hydrophobicity (the number of OCH₂CH₂, see chromatogram on the right (2)), are not retained by a C₁₈ column. However, these compounds can easily be separated by dispersion force interaction using the COSMOSIL PBr column.



► Dispersion force (instantaneous dipole–induced dipole force)

London Dispersion force is a weak intermolecular force that results from dipoles temporarily induced from random unsymmetrical electron positions in two adjacent atoms, also known as “instantaneous dipole–induced dipole force”. It is present in all molecules regardless if they are polar or non-polar. Compounds with high polarizability have stronger dispersion force.

► Compounds with stronger dispersion force

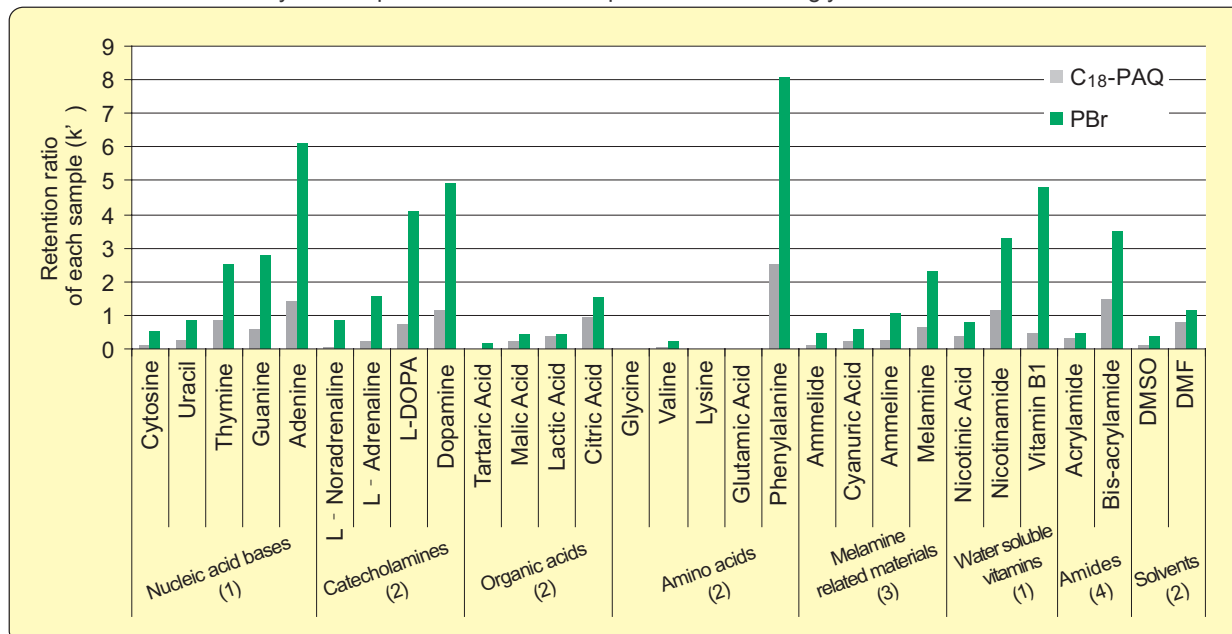
- Larger and heavier molecules
- Molecules with larger and heavier atoms (e.g. from weakest to strongest in halogens, F₂, Cl₂, Br₂, and I₂)
- Molecules with delocalized electrons and resonance (e.g. aromatic compounds)



COSMOSIL PBr column is packed with pentabromobenzyl bonded silica that enables separation by dispersion force interaction.

Suitable Compounds to Analyze by COSMOSIL PBr

COSMOSIL PBr retains cyclic compounds or amide compounds more strongly than C₁₈ columns.



(Mobile phase)

(1) Methanol/ 20mmol/l Phosphate buffer(pH7.0) = 10/90

(2) 20mmol/l Phosphate buffer(pH2.5)

(3) 20mmol/l Phosphate buffer(pH7.0)

(4) Methanol/ H₂O = 10/90

Applications

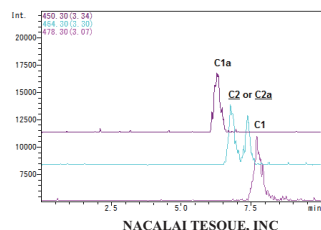
Gentamicin

COSMOSIL Application Data

Column: PBr
 Column size: 2.0mm I.D.-150mm
 Mobile phase: 0.1% Pentafluoropropionic Acid
 -Acetonitrile/ H₂O = 10/90

Flow rate: 0.2 ml/min
 Temperature: 40°C
 Detection: ESI-MS, Positive, SIM

Sample: Gentamicin
 (C1a, C2, C2a, C1)
 Inj. Vol.: 1.0µl



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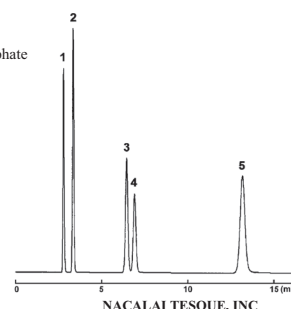
Nucleic Acid Base

COSMOSIL Application Data

Column: PBr
 Column size: 4.6mm I.D.-150mm
 Mobile phase: Methanol/ 20mmol/l Phosphate
 buffer(pH7.0) = 10/90

Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV260nm

Sample: 1: Cytosine (0.05mg/ml)
 2: Uracil (0.05mg/ml)
 3: Thymine (0.05mg/ml)
 4: Guanine (0.05mg/ml)
 5: Adenine (0.05mg/ml)
 Inj. Vol.: 1.0µl



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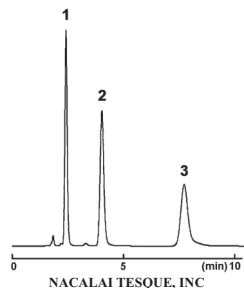
Coenzyme A

COSMOSIL Application Data

Column: PBr
 Column size: 4.6mm I.D.-150mm
 Mobile phase: Methanol/ 20mmol/l Phosphate
 buffer(pH7.0) = 20/80

Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV260nm

Sample: 1: Malonyl Coenzyme A (0.25mg/ml)
 2: Coenzyme A (0.25mg/ml)
 3: Acetyl Coenzyme A (0.25mg/ml)
 Inj. Vol.: 2.0µl



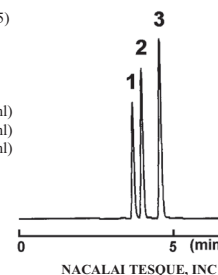
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Methylimidazole Isomers

COSMOSIL Application Data

Column: PBr
 Column size: 4.6mm I.D.-250mm
 Mobile phase: 20mmol/l Phosphate buffer(pH2.5)
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV220nm

Sample: 1: *l*-Methylimidazole (0.1mg/ml)
 2: 2-Methylimidazole (0.1mg/ml)
 3: 4-Methylimidazole (0.1mg/ml)
 Inj. Vol.: 1.0µl



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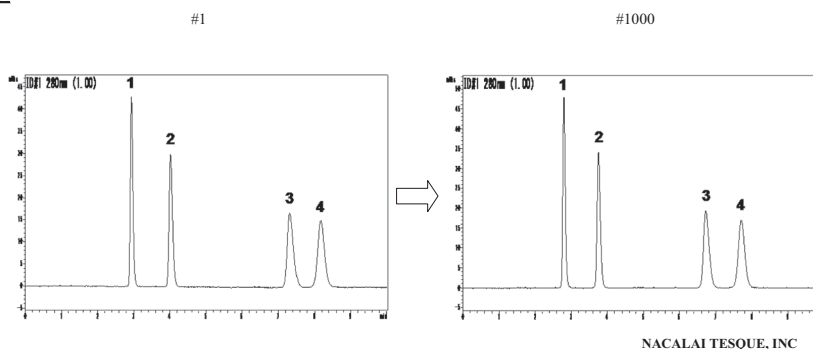
Column Stability Test

COSMOSIL PBr column remains stable after 1000 injections under 100% aqueous condition.

COSMOSIL Application Data

Column: PBr
 Column size: 4.6mm I.D.-150mm
 Mobile phase: 20mmol/l Phosphate buffer(pH2.5)
 Flow rate: 1.0 ml/min
 Temperature: 40°C
 Detection: UV280nm

Sample: 1: *L*-Noradrenaline (0.5mg/ml)
 2: *L*-Adrenaline (0.5mg/ml)
 3: Dopamine (0.5mg/ml)
 4: *L*-DOPA (0.5mg/ml)
 Inj. Vol.: 1.0µl

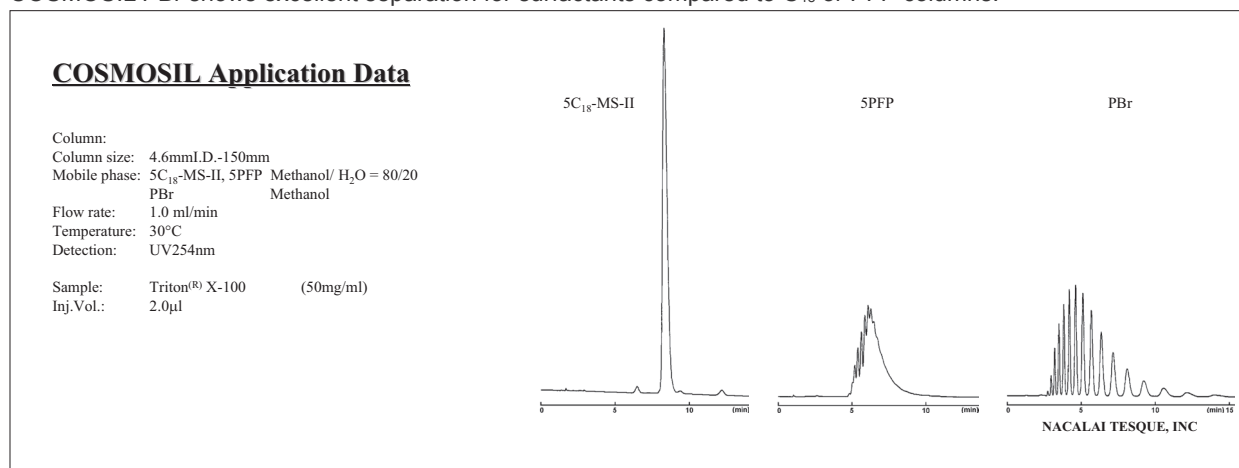


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Applications for Surfactants and Halogen Compounds

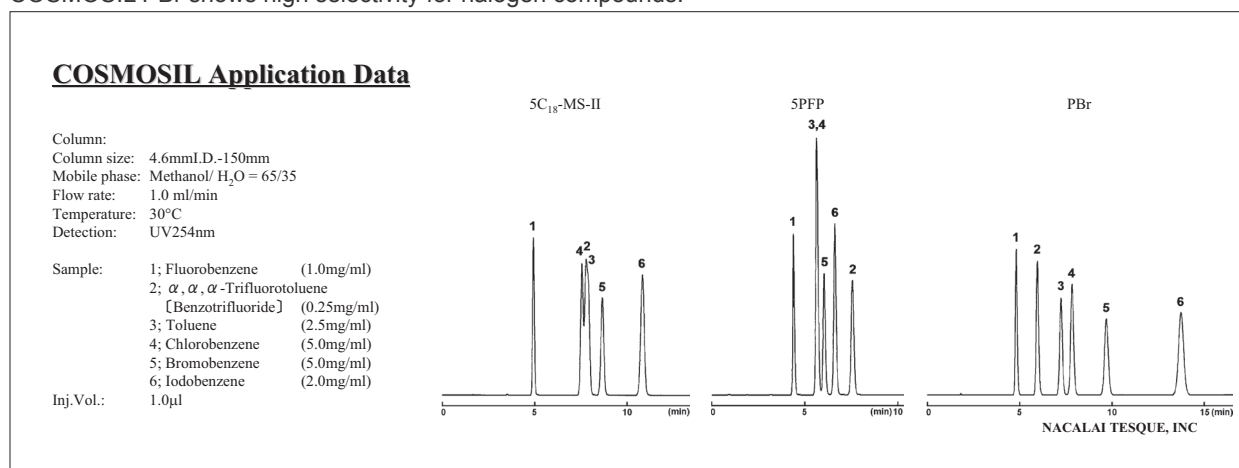
Surfactants

COSMOSIL PBr shows excellent separation for surfactants compared to C₁₈ or PFP columns.



Halogen Compounds

COSMOSIL PBr shows high selectivity for halogen compounds.



Specifications

Packing Material	5PBr
Silica gel	High-purity porous spherical silica
Average particle size	5 µm
Average pore size	approx. 120 Å
Specific surface area	approx. 300 m ² /g
Stationary phase	Pentabromobenzyl group
Bonding type	Monomeric
Endcapping treatment	Yes
Carbon load	approx. 8%
Usable pH range	2-7.5

Ordering Informations

• COSMOSIL 5PBr Columns

Column Size	Product Number	Column Size	Product Number
2.0 mm I.D. x 150 mm	12392-81	10.0 mm I.D. x 250 mm	12397-31
4.6 mm I.D. x 150 mm	12394-61	20.0 mm I.D. x 250 mm	12398-21
4.6 mm I.D. x 250 mm	12395-51	Other size may be available. Please enquire.	

• Guard Columns

Column Size	Product Number
4.6 mm I.D. x 10 mm cartridge*	12444-14
10.0 mm I.D. x 20.0 mm	12396-41
4.6 mm I.D. Cartridge Holder	38009-79

*Cartridge Holder is required.

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



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