Supercritical Fluid Chromatography (SFC) has become more attractive because it offers some advantages over HPLC, such as high speed, unique selectivity and environmentally friendly separations. Many conventional normal-phase stationary phases, such as diol, amino and cyano, have been used for SFC applications. However, these phases present limitations for separations. COSMOSIL SFC Columns have been developed to enhance the capability of SFC separations.

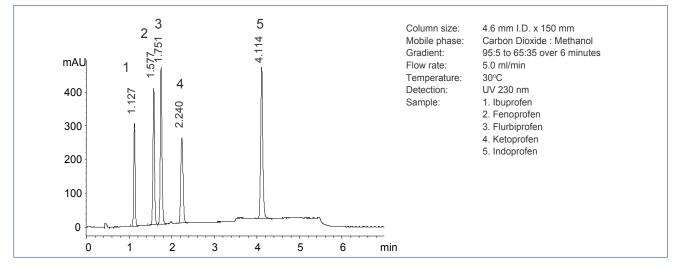
# COSMOSIL SFC Columns

Nacalai Tesque has developed columns specially designed for SFC in collaboration with Nacalai USA and Pfizer, Inc. Global R&D: COSMOSIL HP, PY (equivalent to 2-ethylpyridine) and Quinoline. In addition to these, our HPLC columns Cholester and PBr have been tested for use with SFC.

Packing Material	HP	PY	Quinoline	Cholester	PBr
Particle Sizes	3, 5 µm		2.5,	2.5, 5 μm	
Pore Sizes			120 Å		
Surface Area			300 m²/g		
Structure	HO NH Si	HNOSi		H <sub>3</sub> C H <sub>3</sub> C H <sub>3</sub> C C H <sub>3</sub> C C H <sub>3</sub> C C H <sub>3</sub> C	$Br \\ Br \\$
Stationary Phase	3–Hydroxyphenyl group	Pyridinyl group	Quinoline group	Cholesteryl group	Pentabromobenzyl group

# COSMOSIL HP(3-Hydroxyphenyl)



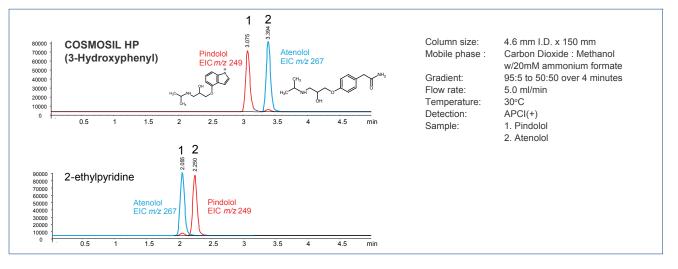


# **COSMOSIL SFC Columns**

-H

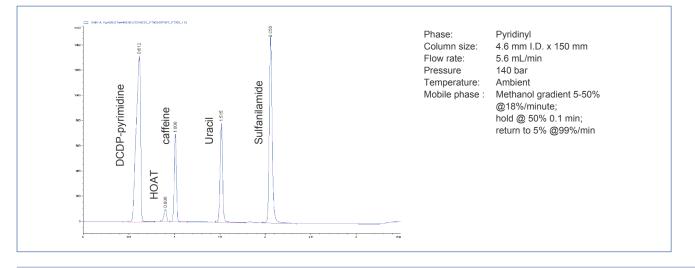


#### Application Data: Beta Blockers Peak elution order reversal under identical conditions



# **COSMOSIL PY (Pyridinyl)**

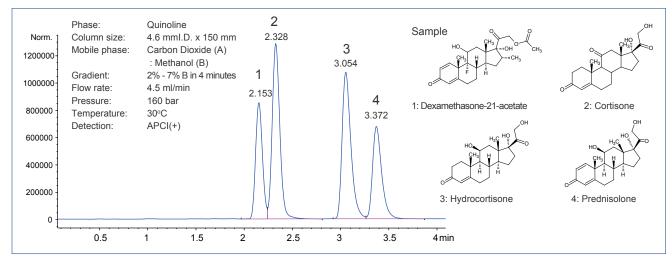
#### Application Data: Hydrophilic organics



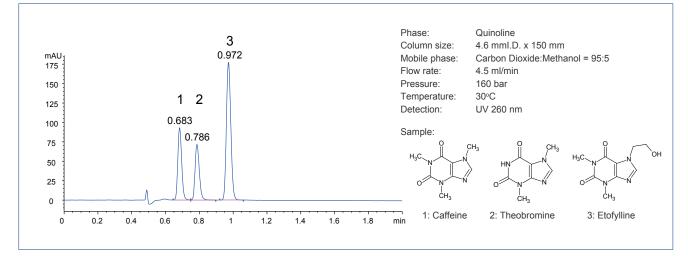
## **COSMOSIL** Quinoline

The structural similarities between polar lipids, such as cholesterol and related analogs, have posed chromatographic and spectrometric challenges to analysts interested in quantifying these potential biomarkers. COSMOSIL Quinoline has been developed to improve the separation of these structural isomers utilizing the  $\pi$ - $\pi$  interactions and structural rigidity of the naphthylethyl phase and the hydrogen bonding of the pyridine phase.

#### **Application Data: Steroids**

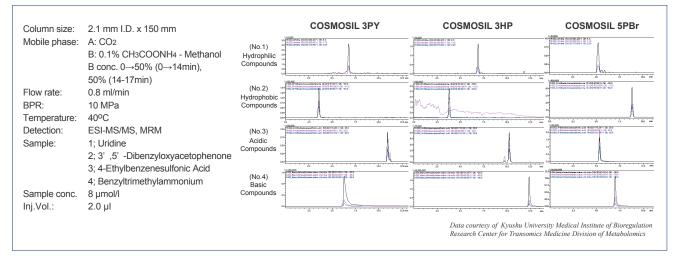


#### **Application Data: Caffeine analogs**



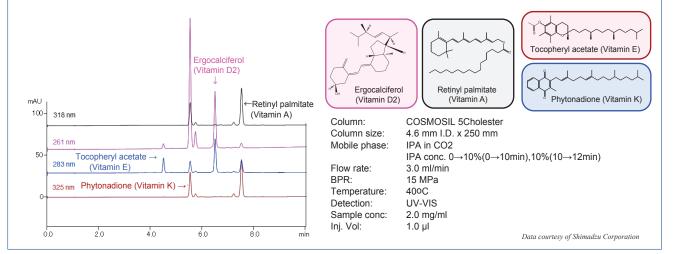
### Comparison of Retention Behavior

The following three stationary phases were evaluated for their retention of hydrophilic, hydrophobic, acidic and basic compounds. COSMOSIL HP and PY elute hydrophobic compounds first and retain hydrophilic compounds longer, whereas PBr elutes in the reverse order, exhibiting high retention for hydrophobic compounds. HP had the longest retention for basic compounds.



## Fat-Soluble Vitamin Analysis with COSMOSIL Cholester

When used with SFC, COSMOSIL Cholester can separate fat-soluble vitamins and their impurities.



COSMOSIL Cholester exhibits strong retention for fat-soluble vitamins and is suitable for on-line SFE-SFC using Shimadzu's Nexera UC. The on-line extraction from food also produced triglyceride impurities, which were successfully separated from the vitamins.

# Ordering Information

COSMOSIL HP (3-Hydroxyphenyl)				COSMOSIL
	Product Name	Column Size (mm I.D. x mm)	Product No.	Product Nam
Packed C (5 μm)	Packed Column	2.0 x 150	13787-91	Packed Colum
	(5 µm)	4.6 x 250	13788-81	(5 µm)
		10.0 x 250	13789-71	
		20.0 x 250	13790-31	
	Guard Column (5 µm)	10.0 x 20	13791-21	Guard Column (5 µm)
Packed Colu (3 µm)	Packed Column	2.0 x 150	13792-11	Packed Colum
	(3 µm)	4.6 x 250	13793-01	<b>(3 µm</b> )

#### PY (Pyridinyl)

Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column	2.0 x 150	13818-81
(5 µm)	4.6 x 250	13827-61
	10.0 x 250	13828-51
	20.0 x 250	13829-41
Guard Column (5 μm)	10.0 x 20	13830-01
Packed Column	2.0 x 150	13831-91
(3 µm)	4.6 x 250	13832-81

#### **COSMOSIL** Quinoline

Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column	2.0 x 150	Inquire
(5 µm)	4.6 x 100	Inquire
	4.6 x 150	Inquire
	10.0 x 150	Inquire
	20.0 x 150	Inquire
Packed Column	3.0 x 50	Inquire
(2.5 µm)	3.0 x 100	Inquire
	3.0 x 150	Inquire

#### **COSMOSIL** Cholester

COSMOSIL Cholester			COSMOSIL PBr		
Product Name	Column Size (mm I.D. x mm)	Product No.	Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column	4.6 x 150	05976-61	Packed Column	4.6 x 150	12394-61
(5 µm)	4.6 x 250 05977-51	(5 µm)	4.6 x 250	12395-51	
	10.0 x 250	05979-31		10.0 x 250	12397-31
	20.0 x 250	05982-71		20.0 x 250	12398-21

Other sizes may be available. Please inquire.

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