

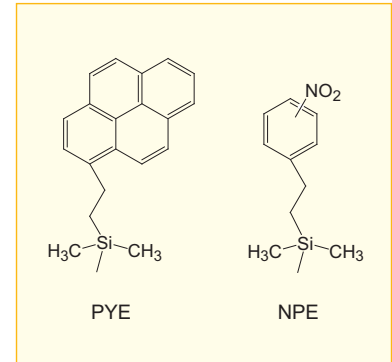
Specialty for Structural Isomers

COSMOSIL PYE / COSMOSIL NPE

COSMOSIL PYE (pyrenylethyl group bonded) and COSMOSIL NPE (nitrophenylethyl group bonded) column show unique retention characteristics based on multiple separation modes such as hydrophobic, charge transfer and π - π interactions. These columns are recommended for the separation of structural isomers.

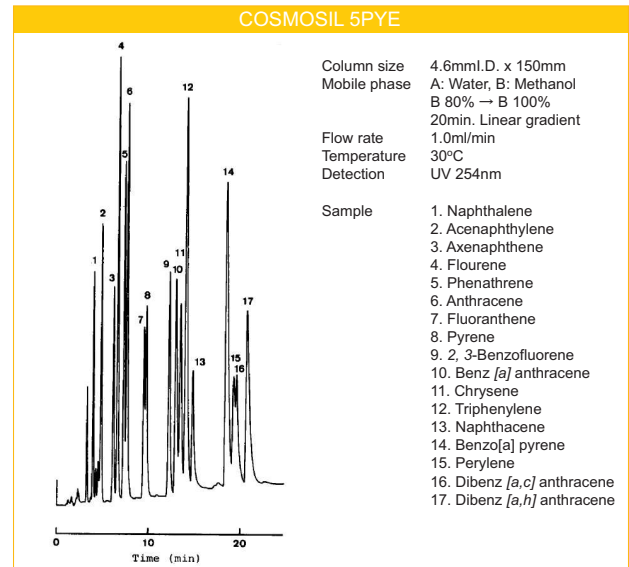
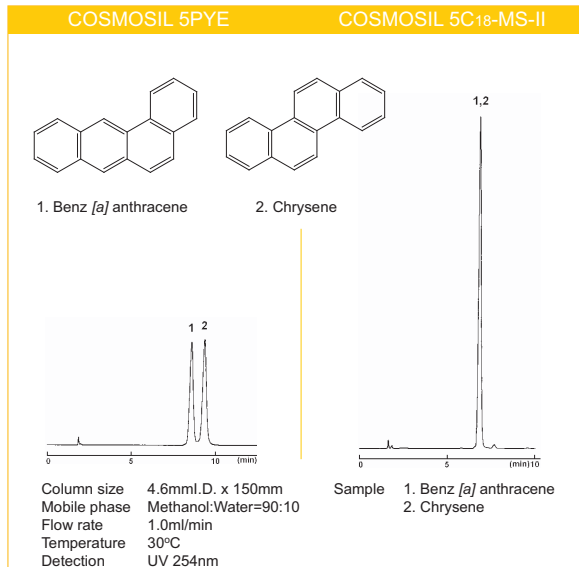
Material characteristics

Packing material	COSMOSIL 5PYE	COSMOSIL 5NPE
Silica gel	high purity spherical porous silica	
Average particle size	5 μ m	
Average pore size	approx. 120 Å	
Specific surface area	approx. 300m ² /g	
Stationary phase	2-(1-pyrenyl)ethyl group	nitrophenylethyl group
Main interaction	Hydrophobic interaction	Hydrophobic interaction,
	π - π interaction	π - π interaction
	Charge transfer interaction	Charge transfer interaction
	Stereo selectivity	Dipole-dipole interaction
End-capping treatment	near-perfect treatment	
Carbon content	approx. 18%	approx. 9%

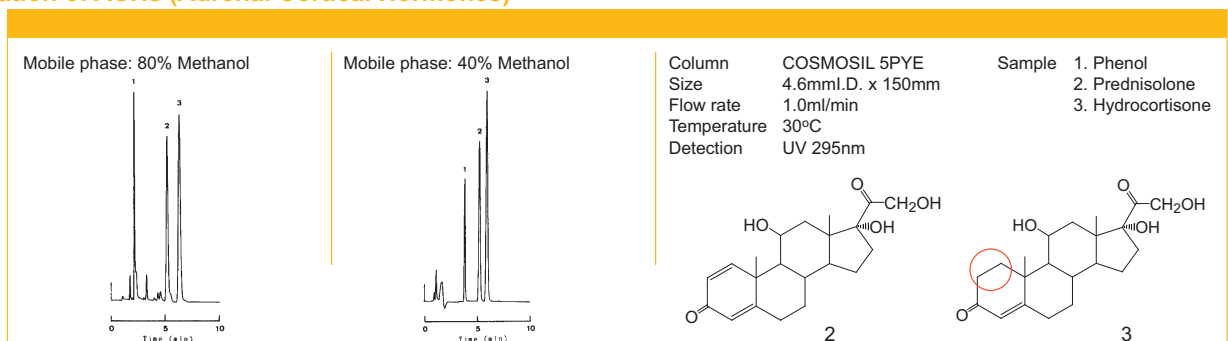


Separation of PAHs

Due to the planar pyrene ring structure and strong π - π interactions, COSMOSIL PYE achieves excellent separation of aromatic isomers.

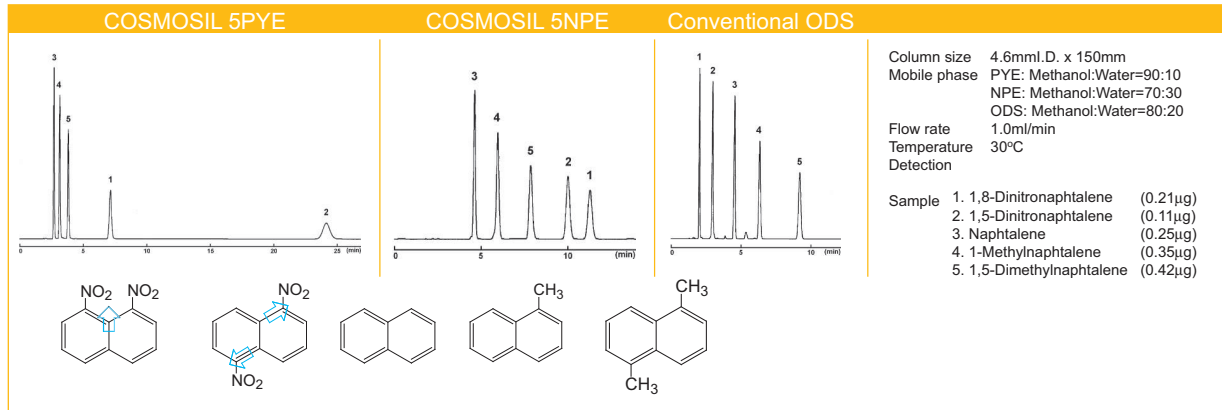


Separation of ACHs (Adrenal Cortical Hormones)



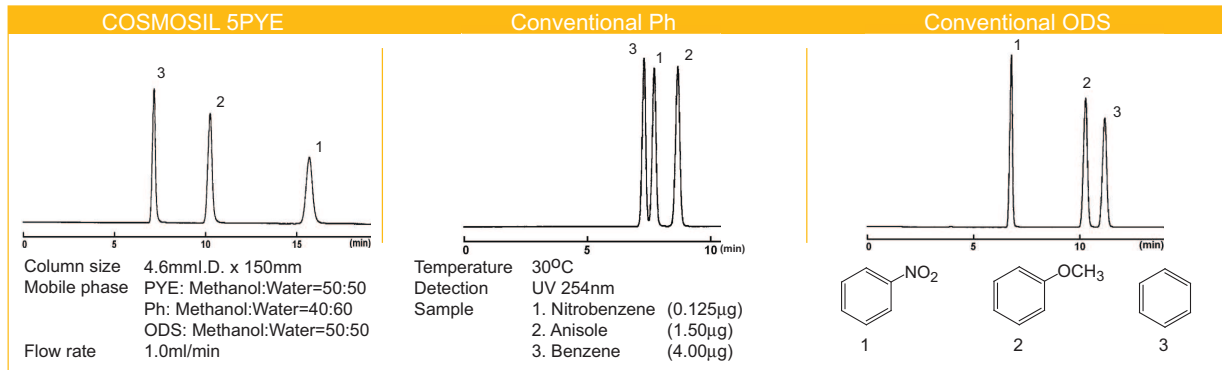
Analysis of disubstituted naphthalenes

COSMOSIL PYE and NPE columns show very unique retention characteristics for compounds containing electron donors and acceptors. These substances elute according to their hydrophobicity in ODS columns. In COSMOSIL PYE and NPE, on the other hand, dinitronaphthalenes are retained more strongly. That means charge transfer interaction contributes to the retention of dinitronaphthalenes. Furthermore, COSMOSIL PYE retains 1,5-dinitronaphthalene (Sample 2) more strongly than the 1,8- form (Sample 1), due to the charge transfer interaction. In the COSMOSIL NPE, on the other hand, Sample 1 is retained more strongly. In addition to π - π interaction, dipole-dipole interaction is utilized for its retention.



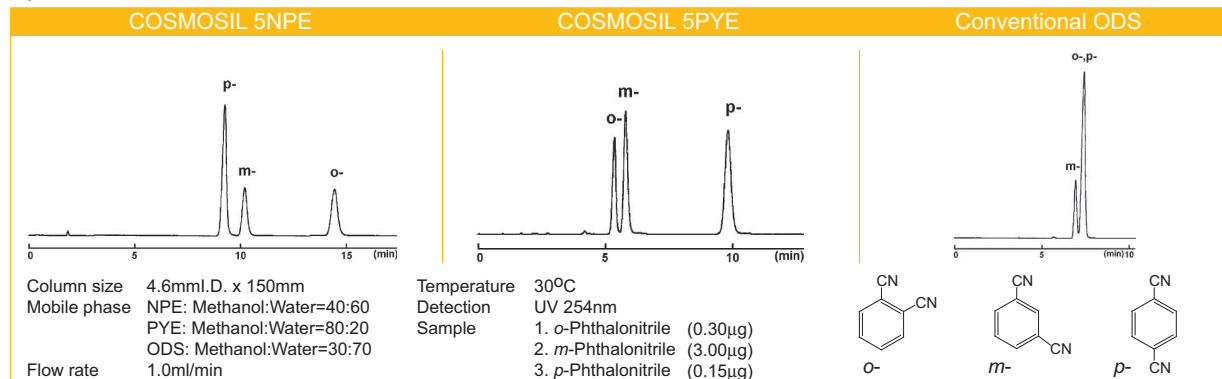
Effect of π - π interaction

The chromatograms below are examples for analysis of the electron donor anisole and the electron acceptors nitrobenzene and benzene. COSMOSIL PYE, conventional Ph and ODS show different elution orders and retention times.

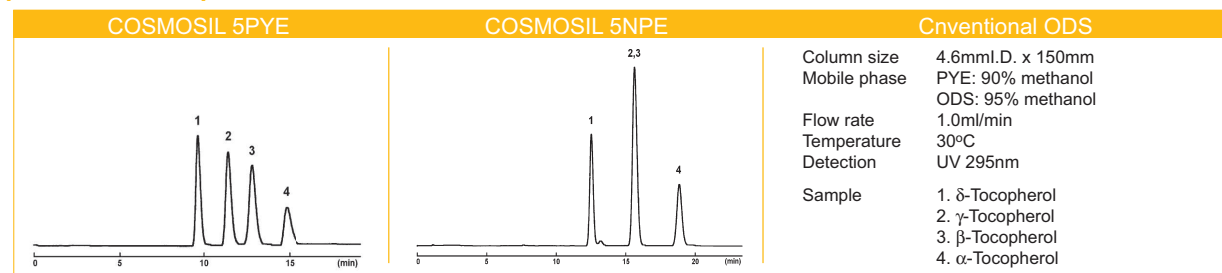


Effect of dipole-dipole interaction

The ODS column cannot sharply separate the positional isomers like phthalonitrile. In contrast, COSMOSIL PYE and NPE can do it very well by π - π interaction. Furthermore, COSMOSIL NPE strongly retains ortho compound which has a big dipole moment.



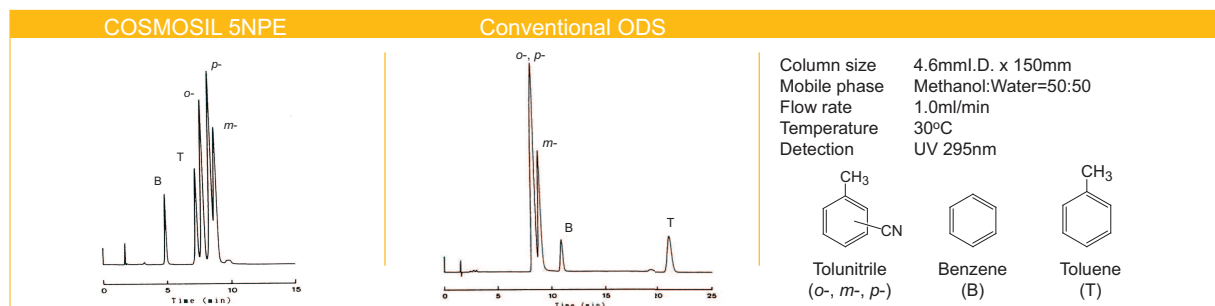
Separation of Tocopherols



Advantage of dipole-dipole interactions

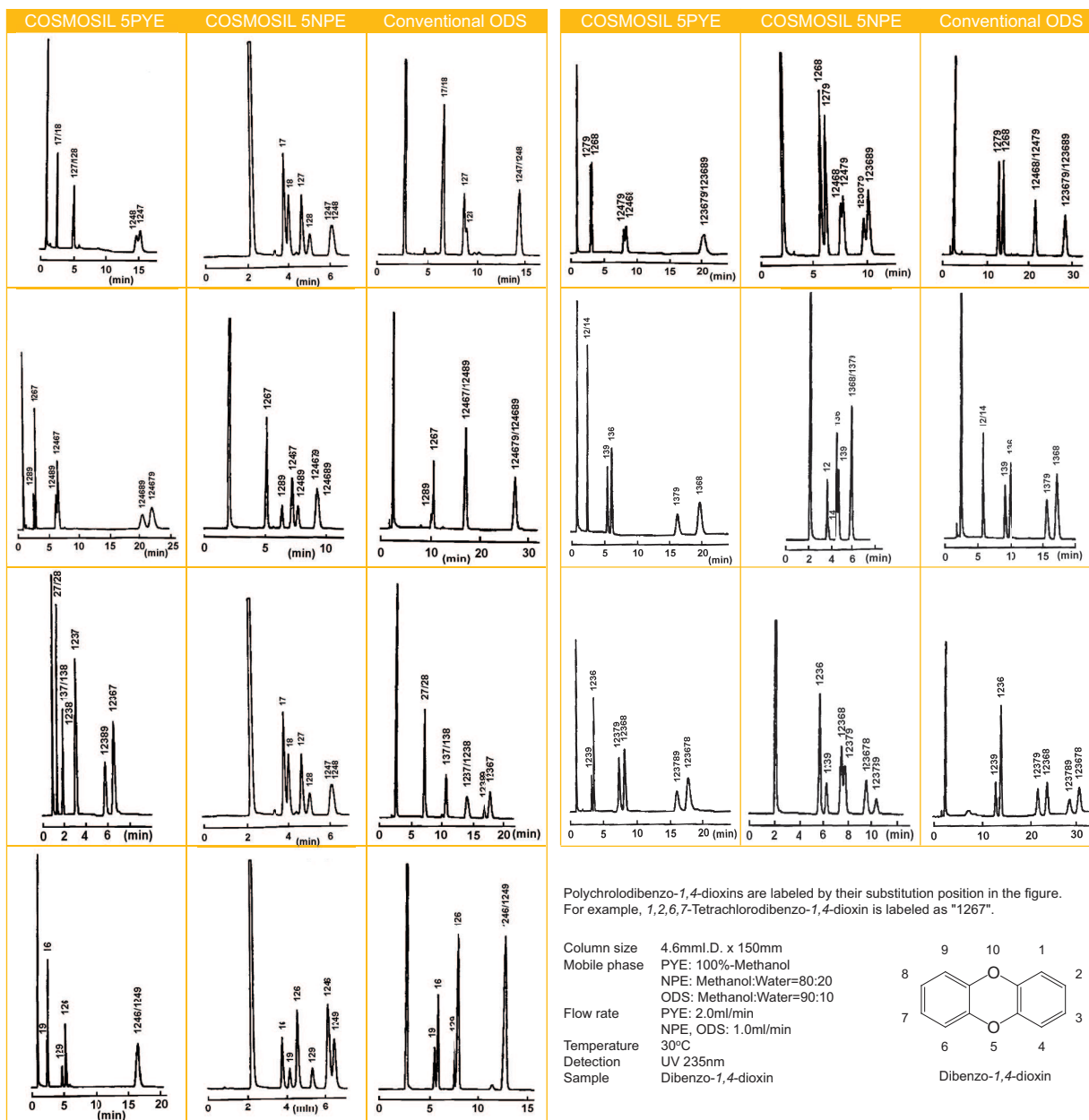
The chromatogram below illustrates the separation of *o*-, *m*-, *p*-tolunitrile. ODS column cannot achieve complete separation of them, while COSMOSIL NPE separates them more greatly.

Comparing hydrophobicity, tolunitrile which contains a CN⁻ group is lower in its hydrophobicity than benzene and toluene. Since hydrophobic interaction is dominant in the separation by a ODS column, tolunitrile elutes first. In COSMOSIL NPE, tolunitrile elutes later. This suggests that COSMOSIL NPE utilizes the interaction between π -electron of the nitrophenyl group and CN⁻ for retention in addition to hydrophobic interaction.

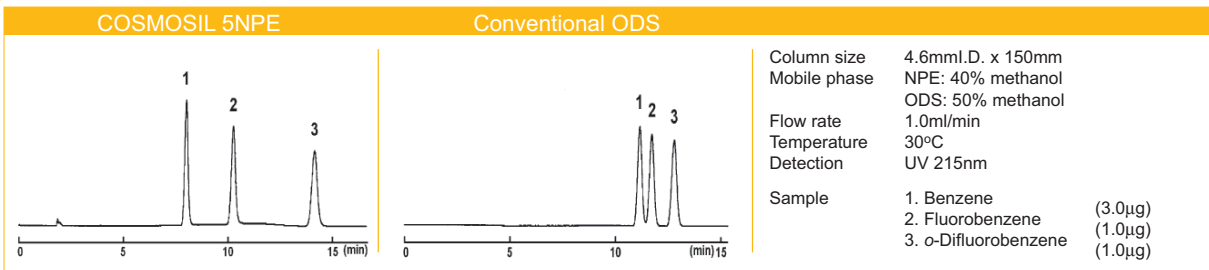


Separation of Dioxins

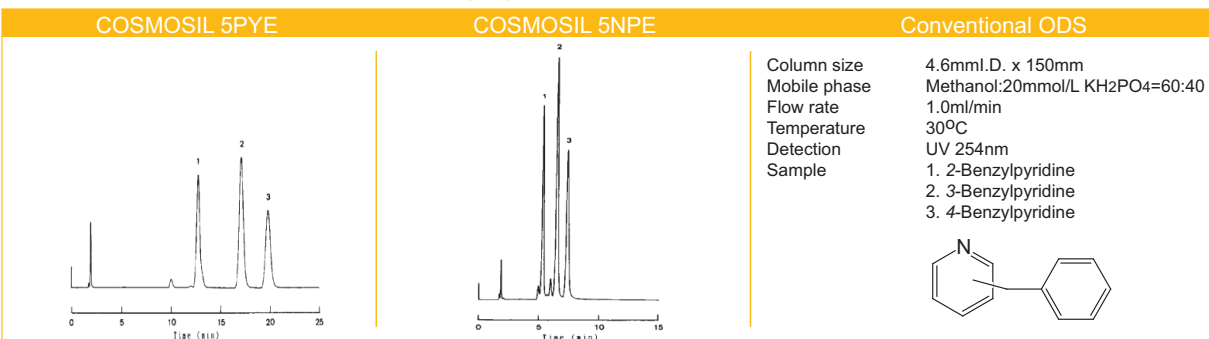
Polychlorodibenzo-1,4-dioxins (pCDDs) have been in the focus of environmental separations due to their extreme toxicity. The pCDDs are usually present as a mixture of isomers. The mixture must be separated in order to evaluate the biological effects of each isomer. The pCDD isomers can be separated by utilizing hydrophobic, charge transfer and dipole-dipole interactions. COSMOSIL PYE retains symmetrical isomers more strongly. In COSMOSIL NPE, on the other hand, isomers with a strong dipole moment are retained preferentially. Both COSMOSIL PYE and NPE offer special resolutions that are beyond the possibilities of conventional ODS columns as shown below.



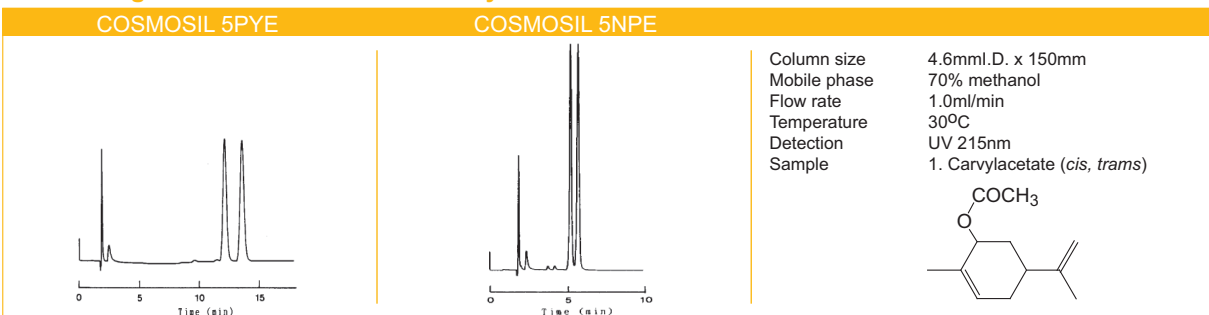
Separation of Fluorides



Separation of positional isomers like Benzylpyridine



Separation of geometrical isomers like Carvylacetate



Ordering information

Product name	Size	Code No.	Product name	Size	Code No.
COSMOSIL PYE	1.0mmI.D. x 150mm	02851-71	COSMOSIL PYE	4.6mmI.D. x 10mm	37903-11
Packed Column	2.0mmI.D. x 150mm	38042-61	Guard Column	10.0mmI.D. x 20mm	38041-71
	2.0mmI.D. x 250mm	34450-31		20.0mmI.D. x 20mm	05867-91
	4.6mmI.D. x 150mm	37837-91		20.0mmI.D. x 50mm	34475-21
	4.6mmI.D. x 250mm	37989-11			
	10.0mmI.D. x 250mm	37996-11			
	20.0mmI.D. x 250mm	38044-41			

Product name	Size	Code No.	Product name	Size	Code No.
COSMOSIL NPE	1.0mmI.D. x 150mm	05897-01	COSMOSIL NPE	4.6mmI.D. x 10mm	37904-01
Packed Column	2.0mmI.D. x 150mm	34328-51	Guard Column	10.0mmI.D. x 20mm	38045-31
	2.0mmI.D. x 250mm	34379-91		20.0mmI.D. x 20mm	05868-81
	4.6mmI.D. x 150mm	37902-21		20.0mmI.D. x 50mm	05869-71
	4.6mmI.D. x 250mm	37990-71			
	10.0mmI.D. x 250mm	05469-11			
	20.0mmI.D. x 250mm	38046-21			

Other size may be available. Please enquire!!

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



Hichrom Limited

1 The Markham Centre, Station Road
Theale, Reading, Berks, RG7 4PE
Tel: 0118 930 3660
Fax: 0118 932 3484
Web site: www.hichrom.co.uk
Email: sales@hichrom.co.uk

NACALAI TESQUE, INC.

Nijo Karasuma, Nakagyo-ku, Kyoto 604-0855, JAPAN
TEL: +81-75-251-1730
FAX: +81-75-251-1763
Web site: <http://www.nacalai.com>
E-mail: info.intl@nacalai.co.jp