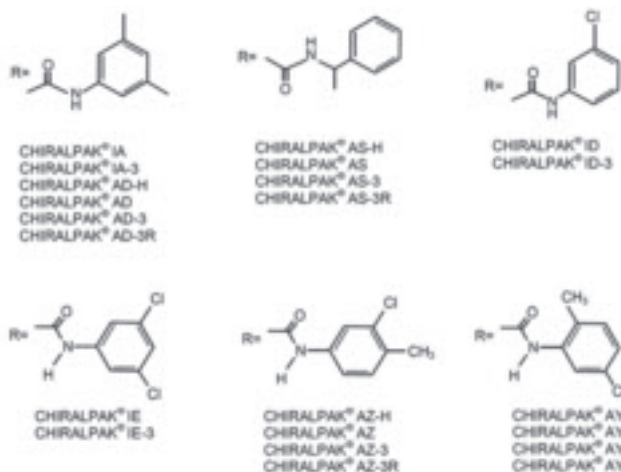


Daicel Polysaccharide Coated Phase Columns

- Original coated polysaccharide phases
- Fast easy method development
- Traditional 10µm, high resolution 5µm and ultra fast 3µm phases

AMYLOSE-O-R



CELLULOSE-O-R

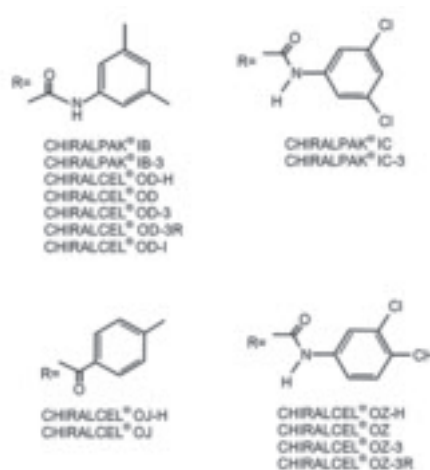


Figure 8. Structures of polysaccharide CSPs

Traditional Normal-Phase Columns (10µm)

The predecessors to the newer generation of immobilized columns, traditional CHIRALPAK® and CHIRALCEL® coated polysaccharide chiral stationary phases are based on a spherical high quality silica support on to which the polymeric chiral selector is physically coated. Due to the coated nature of these chiral supports, solvents should be carefully selected. CHIRALPAK AD and AS (amylose derivative coated on silica) and CHIRALCEL OD and OJ (cellulose derivative coated on silica) are the most widely used of the traditional 10µm phases.

High Resolution Reversed-Phase Columns (5µm)

Reversed-phase versions of the most popular normal-phase columns have been designed for high efficiency reversed-phase applications. These include CHIRALPAK AD-RH and AS-RH together with CHIRALCEL OD-RH and OJ-RH. These phases have the same coated chiral selector as the normal-phase columns but are coated to a hydrophobic high quality silica support. These reversed-phase columns were developed specifically for aqueous-organic eluents. They are suited for applications where the sample is in aqueous media (eg. biological samples) or for samples that require flexibility in terms of pH range. Figure 9 shows the separation of flurbiprofen enantiomers on CHIRALPAK AD-RH.

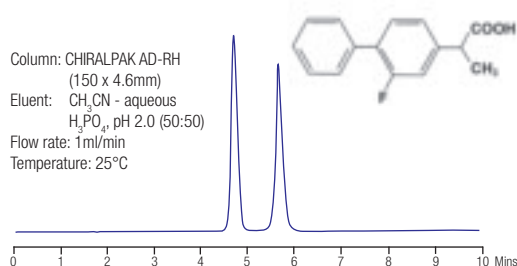


Figure 9. Analysis of flurbiprofen on CHIRALPAK AD-RH.

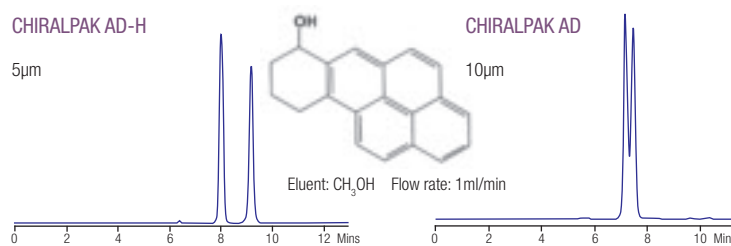


Figure 10. Analysis of 7, 8, 9, 10-tetrahydrobenzo[a]pyren-7-ol

High Resolution Normal-Phase Columns (5µm)

CHIRALPAK AD-H and AS-H together with CHIRALCEL OD-H and OJ-H are higher efficiency 5µm particle size normal-phase columns, used to resolve compounds requiring greater resolution than the traditional 10µm phases. Figure 10 shows the improved resolution obtained using a CHIRALPAK AD-H (5µm) compared to a CHIRALPAK AD (10µm) column.

Daicel Polysaccharide Coated Phase Columns (continued)

Ultra Fast NP and RP Columns (3 μ m)

More recently, 3 μ m particle size NP and RP phases have been introduced for higher resolution, fast analyses (CHIRALPAK AD-3, AD-3R, AS-3, AS-3R and CHIRALCEL OD-3, OD-3R, OJ-3, OJ-3R). These phases enable enhanced chromatographic separations to be achieved using conventional HPLC systems, without experiencing excessive pressure problems. Figure 11 demonstrates that enantiomer separation can be achieved in less than 30 seconds.

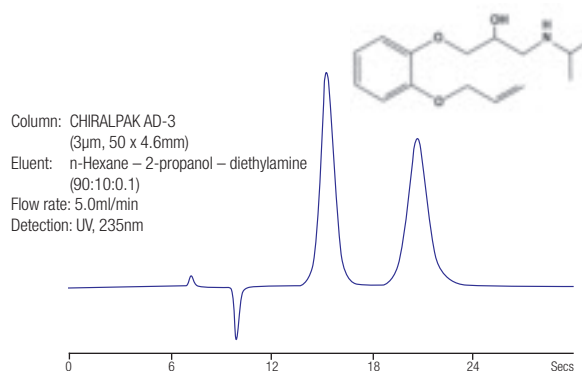


Figure 11. Fast analysis of oxprenolol on CHIRALPAK AD-3

Complementary Cellulose Chiral Phases

In addition to the four main phase types (AD, AS, OD and OJ), a complementary range of derivatized cellulose speciality phases is available. These phases were designed to resolve compounds that are not separated on these more versatile four key phases and include CHIRALCEL OA, OB, OC, OF, OG and OK.

New Polysaccharide Coated Phases

CHIRALPAK AY-H, AZ-H and CHIRALCEL OZ-H, OX-H 5 μ m and CHIRALPAK AY-3, AZ-3 and CHIRALCEL OZ-3, OX-3 3 μ m HPLC and SFC columns contain significantly different chiral selectors to the traditional phases discussed above. They show new recognition profiles, allowing effective method development for compounds not fully resolved on other Daicel columns. They are an excellent complement to the primary screen systems of CHIRALPAK IA, IB, IC and ID or the alternative CHIRALPAK AD, AS and CHIRALCEL OD, OJ.

Figure 12 shows the enhanced separation of the enantiomers of methyl-1-benzyl-5-oxo-3-pyrrolidinecarboxylate using CHIRALCEL OZ-H over that using CHIRALCEL OD-H.

The herbicide metolachlor has two chiral elements due to steric hindrance, which gives rise to four diastereomers. Figure 13 shows a comparison of the separation of these diastereomers using CHIRALPAK AY-H and CHIRALCEL OD-3.

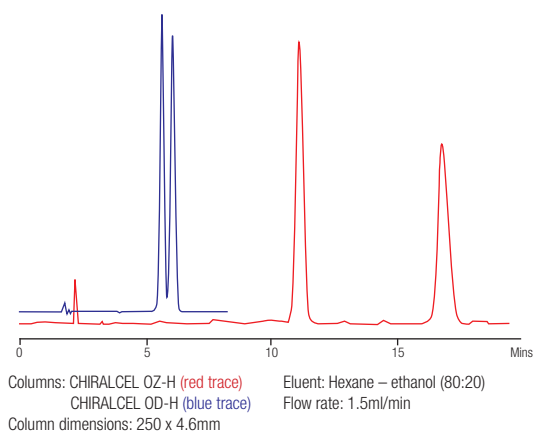


Figure 12. Separation of methyl-1-benzyl-5-oxo-3-pyrrolidinecarboxylate enantiomers

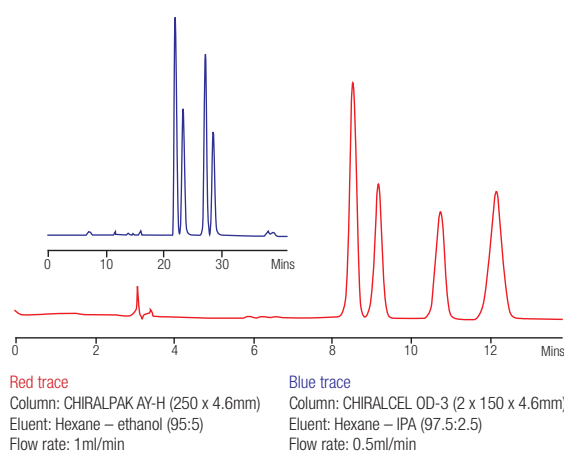


Figure 13. Separation of metolachlor diastereomers

Please see page 86 and 87 for ordering information for CHIRALPAK and CHIRALCEL coated phase columns.

Chiral Screening Service

Chiral Technologies Europe offers a chiral screening service in both HPLC and SFC, for customer supplied samples. A range of their chiral columns are screened under a variety of eluent compositions, in order to identify the most appropriate column. For further details of this service and to obtain a sample submission form, please contact Hichrom. Confidentiality agreements can be set up if required.

Application Guide

Chiral Technologies Europe have produced a fully searchable Application Guide on CD. This contains over 1,100 chiral applications, including new applications on the immobilized CSPs. Please contact Hichrom to obtain a free copy.



Ordering Information - Immobilized Phases

CHIRALPAK 5µm Phase	Column Dimensions (mm)					Analytical Guard Cartridge ¹ (For 4.6mm i.d. Columns)	Semi-prep Guard Column ² (For 10 and 20mm i.d. Columns)
	150 x 2.1	150 x 4.6	250 x 4.6	250 x 10	250 x 20		
IA	80394	80324	80325	80335	80345	80311	80337
IB	81394	81324	81325	81335	81345	81311	81337
IC	83394	83324	83325	83335	83345	83311	83337
ID	84394	84324	84325	84335	84345	84311	84337
IE	85394	85324	85325	85335	85345	85311	85337
IF	86394	86324	86325	86335	86345	86311	86337

CHIRALPAK 3µm Phase	Column Dimensions (mm)					Analytical Guard Cartridge ¹ 3/pk (For 4.6mm i.d. Columns)
	150 x 2.1	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	
IA-3	80594	80522	80523	80524	80525	80511
IB-3	81594	81522	81523	81524	81525	81511
IC-3	83594	83522	83523	83524	83525	83511
ID-3	84594	84522	84523	84524	84525	84511
IE-3	85594	85522	85523	85524	85525	85511
IF-3	86594	86522	86523	86524	86525	86511

¹ Use with holder 00011

and column coupler 000D1

² No holder required

Ordering Information - Traditional Phases

10µm Phase ¹	Column Dimensions (mm)				Analytical Guard Cartridge ² (For 4.6mm i.d. Columns)	Semi-prep Guard Column ³ (For 10mm i.d. Columns)
	150 x 2.1	250 x 4.6	250 x 10	250 x 20		
Normal-phase						
CHIRALPAK AD	19094	19025	19035	19045	19311 ⁴	19032
CHIRALPAK AS	20094	20025	20035	20045	20311 ⁴	20032
CHIRALCEL OD	-	14025	14035	14045	14311 ⁴	14032
CHIRALCEL OJ	-	17025	17035	17045	17311 ⁴	17032
Reversed-phase						
CHIRALCEL OD-R	-	14625	-	-	14611	-

5µm Phase	Column Dimensions (mm)					Analytical Guard Cartridge ² 3/pk (For 4.6mm i.d. Columns)
	150 x 2.1	150 x 4.6	250 x 4.6	250 x 10 ⁵	250 x 20	
Normal-phase						
CHIRALPAK AD-H	19394	19324	19325	19335	19345	19311
CHIRALPAK AS-H	20394	20324	20325	20335	20345	20311
CHIRALCEL OD-H	14394	14324	14325	14335	14345	14311
CHIRALCEL OJ-H	17394	17324	17325	17335	17345	17311
CHIRALPAK AZ-H	61394	61324	61325	61335	61345	61311
CHIRALPAK AY-H	47394	47324	47325	47335	47345	47311
CHIRALCEL OZ-H	42394	42324	42325	42335	42345	42311
CHIRALCEL OX-H	63394	63324	63325	63335	63345	63311
Reversed-phase						
CHIRALPAK AD-RH	19794	19724	-	-	-	19711
CHIRALPAK AS-RH	20794	20724	-	-	-	20711
CHIRALCEL OD-RH	14794	14724	-	-	-	14711
CHIRALCEL OJ-RH	17794	17724	-	-	-	17711
CHIRALPAK AZ-RH	61794	61724	-	-	-	61711
CHIRALPAK AY-RH	47794	47724	-	-	-	47711
CHIRALCEL OZ-RH	42794	42724	-	-	-	42711
CHIRALCEL OX-RH	63794	63724	-	-	-	63711

¹ Other phases and column dimensions available

² Use with holder 00011 and column coupler 000D1

³ No holder required

⁴ 5µm material

⁵ Semi-prep guard column available – please enquire

Ordering Information - Traditional Phases (continued)

3µm Phase	Column Dimensions (mm)					Analytical Guard Cartridge ¹ 3/µk (For 4.6mm i.d. Columns)
	150 x 2.1	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	
Normal-phase						
CHIRALPAK AD-3	19594	19522	19523	19524	19525	19511
CHIRALPAK AS-3	-	20522	20523	20524	20525	20511
CHIRALCEL OD-3	14594	14522	14523	14524	14525	14511
CHIRALCEL OJ-3	-	17522	17523	17524	17525	17511
CHIRALPAK AZ-3	-	61522	61523	61524	61525	61511
CHIRALPAK AY-3	-	47522	47523	47524	47525	47511
CHIRALCEL OZ-3	-	42522	42523	42524	42525	42511
CHIRALCEL OX-3	63594	63522	63523	63524	63525	63511
Reversed-phase						
CHIRALPAK AD-3R	19894	19822	19823	19824	-	19811
CHIRALPAK AS-3R	-	20822	20823	20824	-	20811
CHIRALCEL OD-3R	14894	14822	14823	14824	-	14811
CHIRALCEL OJ-3R	-	17822	17823	17824	-	17811
CHIRALPAK AY-3R	-	47822	47823	47824	-	47811
CHIRALPAK AZ-3R	-	61822	61823	61824	-	61811
CHIRALCEL OZ-3R	-	42822	42823	42824	-	42811
CHIRALCEL OX-3R	63894	63822	63823	63824	-	63811

¹ Use with holder 00011 and column coupler 000D1

Ordering Information - SFC Phases

5µm Phase	Column Dimensions ¹ (mm)		
	100 x 4.6	250 x 10	250 x 20
CHIRALPAK IA SFC	80423	80435	80445
CHIRALPAK IB SFC	81423	81435	81445
CHIRALPAK IC SFC	83423	83435	83445
CHIRALPAK ID SFC	84423	84435	84445
CHIRALPAK IE SFC	85423	85435	85445
CHIRALPAK IF SFC	86423	86435	86445
CHIRALPAK AD-H SFC	19423	19435	19445
CHIRALPAK AS-H SFC	20423	20435	20445
CHIRALCEL OD-H SFC	14423	14435	14445
CHIRALCEL OJ-H SFC	17423	17435	17445
CHIRALPAK AZ-H SFC	61423	61435	61445
CHIRALPAK AY-H SFC	47423	47435	47445
CHIRALCEL OZ-H SFC	42423	42435	42445
CHIRALCEL OX-H SFC	63423	63435	63445

¹ Please enquire regarding larger i.d. prep columns
