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Alcyon SFC Columns

Contents

Introduction

The advantages of Supercritical Fluid Chromatography (SFC) compared to Liquid Chromatography include faster separations, ease of sample recovery, reduced solvent consumption and therefore costs. To meet the needs of this mode of separation, YMC has introduced a range of achiral and chiral products dedicated for use in SFC: Alcyon.

The column hardware is specifically designed for SFC applications. Each Alcyon SFC column is delivered with a column inspection report prepared in SFC mode to allow easy comparisons of standard tests without any requirement to change separation mode.

Alcyon SFC

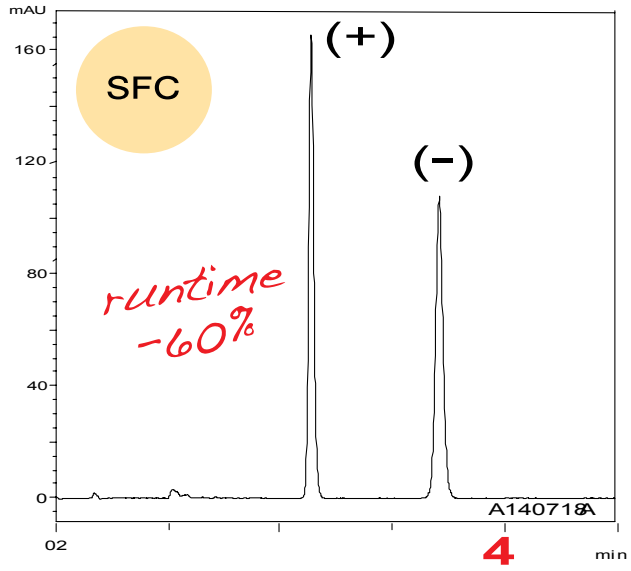
- cost efficient: reduced solvent consumption!
- time saving: faster separations with high resolution
- flexible: chiral and achiral stationary phases
- column inspection report under SFC conditions

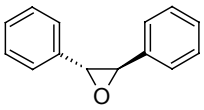
CHIRAL	Alcyon Coated Polysaccharides		Alcyon Immobilised Polysaccharides		
	Alcyon SFC CSP Amylose-C	Alcyon SFC CSP Cellulose-C	Alcyon SFC CSP Amylose-SA	Alcyon SFC CSP Cellulose-SB	Alcyon SFC CSP Cellulose-SC
Particle Size	3; 5 µm				
Chiral selector	Amylose tris (3,5-dimethyl-phenylcarbamate)	Cellulose tris (3,5-dimethyl-phenylcarbamate)	Amylose tris (3,5-dimethyl-phenylcarbamate)	Cellulose tris (3,5-dimethyl-phenylcarbamate)	Cellulose tris (3,5-dichloro-phenylcarbamate)
USP	L51	L40	L99	—	—
Shipping solvent	2-propanol	2-propanol	2-propanol	2-propanol	2-propanol
Usable pH range	3.5 - 6.5	3.5 - 6.5	2.0 - 9.0	2.0 - 9.0	2.0 - 9.0
Temperature range	0-40°C				
Pressure limit	2.1, 3.0 and 4.6 mm ID: 30 MPa (4350 psi) 10 and 20 mm ID: 20 MPa (2980 psi)				

ACHIRAL	Alcyon SFC Triart C18	Alcyon SFC Triart Diol	Alcyon SFC Triart PFP	Alcyon SFC CN	Alcyon SFC SIL
	$-C_{18}H_{37}$	$-CH_2CHCH_2$ OHOH	$-(CH_2)_3$ 	$-(CH_2)_3-CN$	-OH
USP	L1	L20	L43	L10	L3
Particle size / µm	5	5	5	5	5
Pore size / nm	12	12	12	12	12
pH range	1.0 - 12.0	2.0 - 10.0	1.0 - 8.0	2.0 - 7.5	2.0 - 7.5
Shipping solvent	2-propanol	2-propanol	2-propanol	2-propanol	2-propanol
Pressure limit	2.1 and 4.6 mm ID: 30 MPa (4350 psi) 10 and 20 mm ID: 20 MPa (2980 psi)				

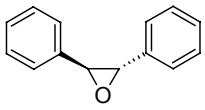
Alcyon SFC

Fast separation with high resolution

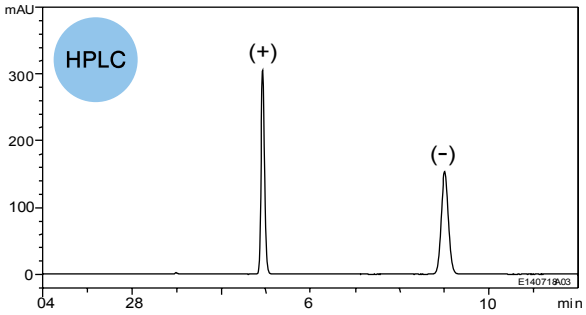




(+)-*R,R-trans*-Stilbene oxide



(-)-*S,S-trans*-Stilbene oxide

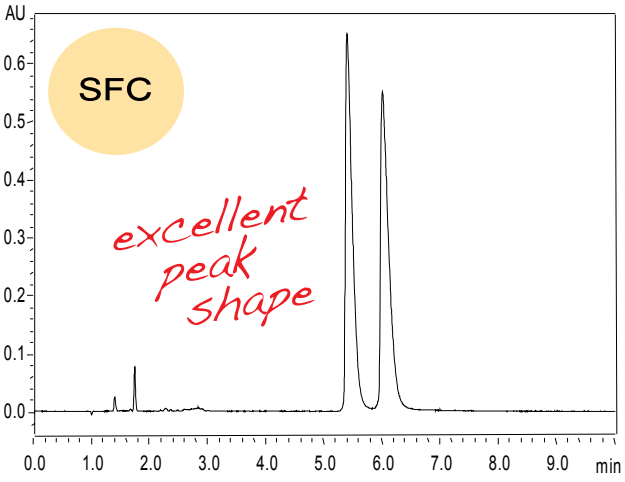


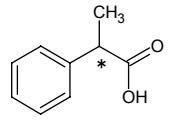
Column:	**Alcyon SFC CSP Amylose-C** (5 µm) 250 x 4.6 mm ID
Part No.:	KAN99S05-2546WTS
Eluent:	CO_2 / methanol (80/20)
Flow:	3.0 mL/min
Temperature:	40°C
Detection:	UV at 220 nm
Back pressure:	17.2 MPa (2500 psi)

Column:	CHIRAL ART Amylose-C (5 µm) 250 x 4.6 mm ID
Part No.:	KAN99S05-2546WT
Eluent:	*n*-hexane / 2-propanol (90/10)
Flow:	1.0 mL/min
Temperature:	25°C
Detection:	UV at 220 nm

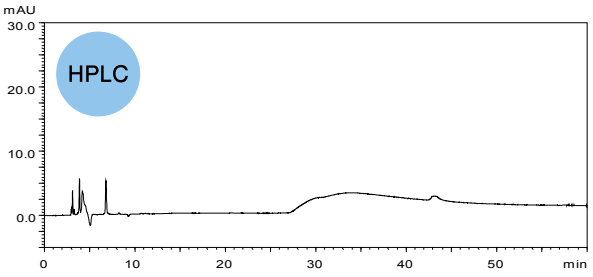
Faster chiral separation of *trans*-stilbene oxide is achieved using supercritical fluid chromatography compared to HPLC as the separation mode. Lower viscosity and larger diffusion coefficients for supercritical fluid provide rapid separations of both chiral and achiral compounds.

Excellent peak shape using mobile phase without the addition of acid modifier





2-Phenylpropionic acid



Column:	**Alcyon SFC CSP Cellulose-C** (5 µm) 250 x 4.6 mm ID
Part No.:	KCN99S05-2546WTS
Eluent:	CO_2 / methanol (98/2)
Flow:	3.0 mL/min
Temperature:	35°C
Detection:	UV at 220 nm
Back pressure:	10.3 MPa (2000 psi)

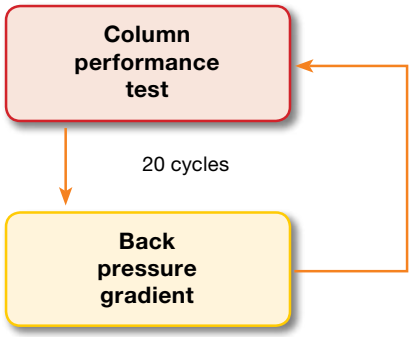
Column:	CHIRAL ART Cellulose-C (5 µm) 250 x 4.6 mm ID
Part No.:	KCN99S05-2546WT
Eluent:	*n*-hexane / 2-propanol (99/1)
Flow:	1.0 mL/min
Temperature:	25°C
Detection:	UV at 220 nm

Excellent peak shape of 2-phenylpropionic acid is obtained using SFC chiral separation. Under HPLC conditions, the peak shape is very broad with mobile phase containing no additives such as an acid. With SFC, on the other hand, peak shapes are very good just with a mixture of CO_2 and methanol. It is thought that supercritical carbon dioxide acts as an acid.

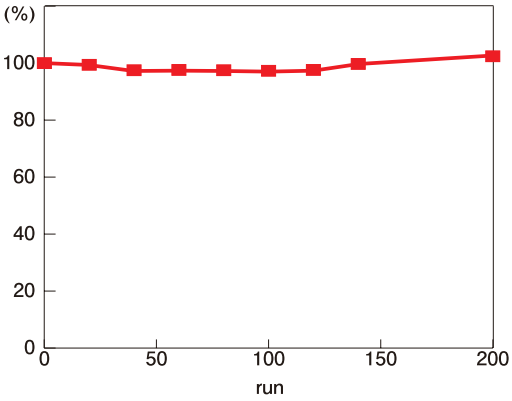
* Application data by courtesy YMC Co., Ltd.

Alcyon SFC

High column stability under repeated back pressure gradient condition



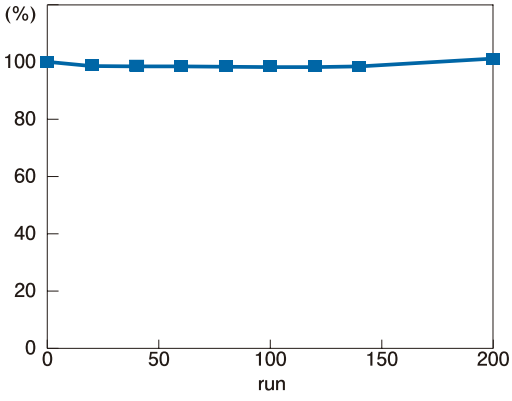
Stability of theoretical plate number



Stability test

Column:	**Alcyon SFC CSP Amylose-C** (5 µm) 250 x 4.6 mm ID
Part No.:	KAN99S05-2546WTS
Eluent:	CO_2 / methanol (80/20)
Flow:	1.0 mL/min
Temperature:	50°C
Back pressure:	10.3 MPa (1500 psi) - 24.1 MPa (3500 psi) (0-10 min) 10.3 MPa (1500 psi) (10-13 min)

Stability of retention time



Column performance test (every 20 gradient cycles)

Column:	**Alcyon SFC CSP Amylose-C** (5 µm) 250 x 4.6 mm ID
Part No.:	KAN99S05-2546WTS
Eluent:	CO_2 / methanol (80/20)
Flow:	3.0 mL/min
Temperature:	50°C
Detection:	UV at 220 nm
Back pressure:	10.3 MPa (1500 psi)
Sample:	*trans*-stilbene oxide

Results for the sequential analysis under back pressure gradient conditions using Alcyon SFC CSP Amylose-C are shown above. Theoretical plate numbers and retention times are maintained even after the sequential gradient test. Alcyon SFC columns have excellent stability under such demanding conditions.

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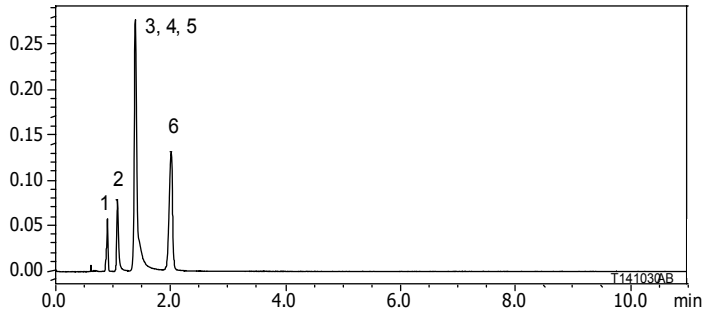
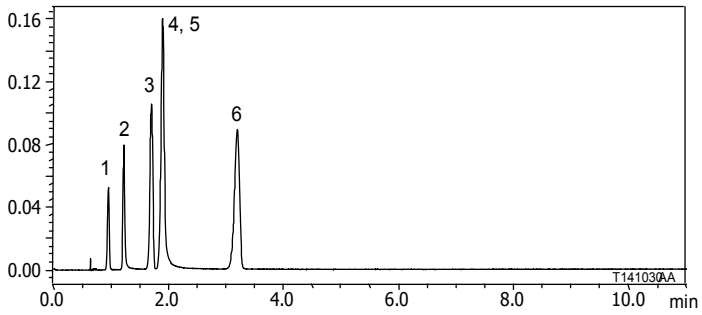
Separation of phenols

Alcyon SFC CN

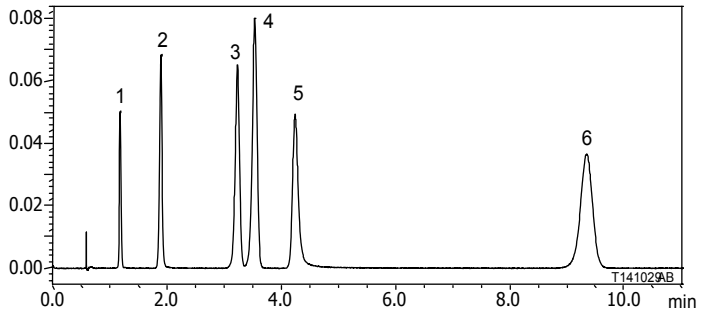


1. Phenol
3. Resorcinol
5. Pyrogallol
2. Catechol
4. Hydroquinone
6. Phloroglucinol

Alcyon SFC SIL



Alcyon SFC Triart Diol



Column:	(5 µm) 250 x 4.6 mm ID
Eluent:	**CO_2 / methanol (88/12)**
Flow:	3.0 mL/min
Temperature:	30°C
Detection:	UV at 230 nm
Back pressure:	10.3 MPa (2000 psi)

The results for the analysis of six phenols using three different achiral columns are shown. Alcyon SFC Triart Diol shows the best separation in this case.

* Application data by courtesy YMC Co., Ltd.

Ordering Information

CHIRAL

Particle size	Column size length x ID [mm]	Product number				
		Coated type		Immobilised type		
		Alcyon SFC CSP Amylose-C	Alcyon SFC CSP Cellulose-C	Alcyon SFC CSP Amylose-SA	Alcyon SFC CSP Cellulose-SB	Alcyon SFC CSP Cellulose-SC
5 µm	150 x 2.1	KAN99S05-15Q1WTS	KCN99S05-15Q1WTS	KSA99S05-15Q1WTS	KSB99S05-15Q1WTS	KSC99S05-15Q1WTS
	150 x 4.6	KAN99S05-1546WTS	KCN99S05-1546WTS	KSA99S05-1546WTS	KSB99S05-1546WTS	KSC99S05-1546WTS
	250 x 4.6	KAN99S05-2546WTS	KCN99S05-2546WTS	KSA99S05-2546WTS	KSB99S05-2546WTS	KSC99S05-2546WTS
	250 x 10	KAN99S05-2510WTS	KCN99S05-2510WTS	KSA99S05-2510WTS	KSB99S05-2510WTS	KSC99S05-2510WTS
	250 x 20	KAN99S05-2520WTS	KCN99S05-2520WTS	KSA99S05-2520WTS	KSB99S05-2520WTS	KSC99S05-2520WTS

Particle size	Column size length x ID [mm]	Product number				
		Coated type		Immobilised type		
		Alcyon SFC CSP Amylose-C	Alcyon SFC CSP Cellulose-C	Alcyon SFC CSP Amylose-SA	Alcyon SFC CSP Cellulose-SB	Alcyon SFC CSP Cellulose-SC
3 µm	50 x 3.0	KAN99S03-0503WTS	KCN99S03-0503WTS	KSA99S03-0503WTS	KSB99S03-0503WTS	KSC99S03-0503WTS
	100 x 3.0	KAN99S03-1003WTS	KCN99S03-1003WTS	KSA99S03-1003WTS	KSB99S03-1003WTS	KSC99S03-1003WTS
	150 x 2.1	KAN99S03-15Q1WTS	KCN99S03-15Q1WTS	KSA99S03-15Q1WTS	KSB99S03-15Q1WTS	KSC99S03-15Q1WTS
	150 x 3.0	KAN99S03-1503WTS	KCN99S03-1503WTS	KSA99S03-1503WTS	KSB99S03-1503WTS	KSC99S03-1503WTS
	150 x 4.6	KAN99S03-1546WTS	KCN99S03-1546WTS	KSA99S03-1546WTS	KSB99S03-1546WTS	KSC99S03-1546WTS
	250 x 4.6	KAN99S03-2546WTS	KCN99S03-2546WTS	KSA99S03-2546WTS	KSB99S03-2546WTS	KSC99S03-2546WTS

ACHIRAL

Particle size	Column size length x ID [mm]	Product number				
		Alcyon SFC Triart C18	Alcyon SFC Triart Diol	Alcyon SFC Triart PFP	Alcyon SFC CN	Alcyon SFC SIL
5 µm	150 x 2.1	TA12S05-15Q1WTS	TDN12S05-15Q1WTS	TPF12S05-15Q1WTS	CN12S05-15Q1WTS	SL12S05-15Q1WTS
	150 x 4.6	TA12S05-1546WTS	TDN12S05-1546WTS	TPF12S05-1546WTS	CN12S05-1546WTS	SL12S05-1546WTS
	250 x 4.6	TA12S05-2546WTS	TDN12S05-2546WTS	TPF12S05-2546WTS	CN12S05-2546WTS	SL12S05-2546WTS
	250 x 10	TA12S05-2510WTS	TDN12S05-2510WTS	TPF12S05-2510WTS	CN12S05-2510WTS	SL12S05-2510WTS
	250 x 20	TA12S05-2520WTS	TDN12S05-2520WTS	TPF12S05-2520WTS	CN12S05-2520WTS	SL12S05-2520WTS

Ordering Information

Additional SFC columns

Particle size	Column size length x ID [mm]	Product number			
		YMC-Pack 2-Ethyl pyridine	YMC-Pack Diethylaminopropyl	YMC-Pack Propyl acetamide	YMC-Pack Pyridine amide
5 µm	250 x 4.6	EP06S05-2546PS	DE06S05-2546PS	PP06S05-2546PS	PY06S05-2546PS
	250 x 21.2	EP06S05-2521PS	DE06S05-2521PS	PP06S05-2521PS	PY06S05-2521PS
	250 x 30	EP06S05-2530PS	DE06S05-2530PS	PP06S05-2530PS	PY06S05-2530PS

3 and 10 µm available on request