

KINGSORB

- For Availability and Ordering Information please contact your Phenomenex Technical Consultant.

KROMASIL® *

- High efficiency 3.5µ silica particles available in C4, C8, C18 and NH₂ phases – identical bonding to 5µ
- Very high loading capacity
- Excellent chemical and mechanical stability
- Popular for scale-up applications

Kromasil® is a spherical, totally porous silica manufactured by Eka Chemicals. Kromasil is available for analytical, preparative, and process scale chromatography.

Kromasil can withstand pHs up to 9.0 and has a narrow pore size distribution.

Phenomenex offers Kromasil in both prepacked columns and bulk form. Kromasil is available in 3.5, 5, 7, 10, 13, and 16µ particles in 60, 100 and 200Å pore sizes.

Material Characteristics

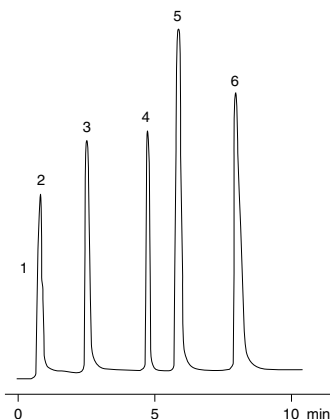
Packing Material	Particle Shape/Size (µ)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m ² /g)	Carbon Load %	Calculated Bonded Phase Coverage (µmole/m ²)	End Capping
Kromasil Silica	Spher. 3.5, 5, 7, 10, 13, 16	100	0.9	340	0	0	No
Kromasil C4	Spher. 3.5, 5, 7, 10, 13, 16	100	0.9	340	8	3.8	Yes
Kromasil C8	Spher. 3.5, 5, 7, 10, 13, 16	100	0.9	340	12	3.6	Yes
Kromasil C18	Spher. 3.5, 5, 7, 10, 13, 16	100	0.9	340	19	3.1	Yes
Kromasil NH ₂	Spher. 3.5, 5, 7, 10, 13, 16	100	0.9	340	—	—	No

3.5µ Phase for Fast Separations

- Same surface properties as other Kromasil phases
- Available as silica, C4, C8, C18, and NH₂

App ID 5393 Ion-Exchange Interactions

Column: Kromasil 3.5µ C18
Dimensions: 150 x 4.6mm
Order No.: 00F-4283-E0
Mobile Phase: Acetonitrile/10mM sodium phosphate, pH 7.0 (60:40)
Flow Rate: 1.5 mL/min
Detection: UV @ 215nm
Temp.: 40°C
Sample:
 1. Uracil
 2. Phenylpropanolamine (3.0 µg)
 3. Nortriptyline (1.75 µg)
 4. Toluene (3.5 µg)
 5. Imipramine (3.9 µg)
 6. Amitriptyline (3.0 µg)

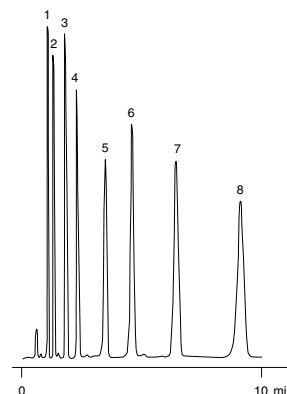


*Kromasil® is a trademark of EKA Chemicals.

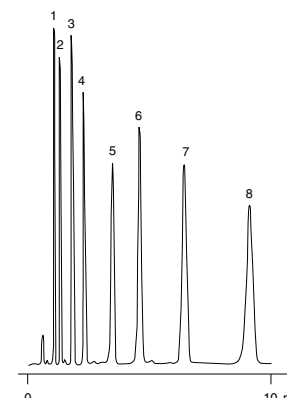
App ID 5397 Resistance to Alkalinity

Column: Kromasil 10µ C8
Dimensions: 200 x 4.6mm
Order No.: 00P-3108-E0
Mobile Phase: Methanol/NH₄AC (70:30)/NH₃ pH 9.25
Flow Rate: 4.0 mL/min
Detection: UV @ 254 nm
Temp.: Ambient
Sample:
 1. Benzamide
 2. Benzyl Alcohol
 3. Benzaldehyde
 4. Methyl Benzoate
 5. Toluene
 6. Benzene
 7. n-Propylbenzene
 8. n-Butylbenzene

New column



After 10,000 column volumes of basic mobile phase pH 9.25



KROMASIL®

ORDERING INFORMATION

SecurityGuard™ Cartridges require universal holder Order No.: KJO-4282

3.5µ Columns (mm)								SecurityGuard™ Cartridges	
Phases	30 x 2.0	50 x 2.0	150 x 2.0	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	4 x 2.0mm /10pk	4 x 3.0mm /10pk
Silica	—	—	00F-4280-B0	—	—	—	00F-4280-E0	AJO-4347	AJO-4348
C4	00A-4281-B0	00B-4281-B0	00F-4281-B0	00A-4281-E0	00B-4281-E0	00D-4281-E0	00F-4281-E0	—	—
C8	—	00B-4282-B0	00F-4282-B0	—	00B-4282-E0	00D-4282-E0	00F-4282-E0	AJO-4289	AJO-4290
C18	00A-4283-B0	00B-4283-B0	00F-4283-B0	00A-4283-E0	00B-4283-E0	00D-4283-E0	00F-4283-E0	AJO-4286	AJO-4287
NH ₂	00A-4284-B0	00B-4284-B0	00F-4284-B0	—	00B-4284-E0	—	00F-4284-E0	AJO-4301	AJO-4302

for ID: 2.0-3.0mm 3.2-8.0mm

5µ Columns (mm)								SecurityGuard™ Cartridges		
Phases	250 x 2.0	150 x 3.2	250 x 3.2	150 x 4.6	250 x 4.6	250 x 10	250 x 21.2	4 x 2.0mm /10pk	4 x 3.0mm /10pk	10 x 10mm /3pk
Silica	—	00F-3102-R0	—	00F-3102-E0	00G-3102-E0	00G-3102-N0	00G-3102-P0	AJO-4347	AJO-4348	AJO-7223
C4	00G-3104-B0	00F-3104-R0	—	00F-3104-E0	00G-3104-E0	—	—	AJO-4292	AJO-4293	AJO-7372
C8	00G-3091-B0	00F-3091-R0	00G-3091-R0	00F-3091-E0	00G-3091-E0	00G-3091-N0	—	AJO-4289	AJO-4290	AJO-7222
C18	00G-3033-B0	00F-3033-R0	00G-3033-R0	00F-3033-E0	00G-3033-E0	00G-3033-N0	00G-3033-P0	AJO-4286	AJO-4287	AJO-7221
NH ₂	00G-3189-B0	00F-3189-R0	—	00F-3189-E0	00G-3189-E0	—	00G-3189-P0	AJO-4301	AJO-4302	AJO-7364

for ID: 2.0-3.0mm 3.2-8.0mm 9-16mm

10µ Columns (mm)				SecurityGuard™ Cartridges	
Phases	250 x 4.6	250 x 10	250 x 21.2	4 x 3.0mm /10pk	10 x 10mm /3pk
Silica	00G-3105-E0	00G-3105-N0	—	AJO-4348	AJO-7223
C4	00G-3107-E0	00G-3107-N0	00G-3107-P0	AJO-4293	AJO-7372
C8	00G-3108-E0	00G-3108-N0	00G-3108-P0	AJO-4290	AJO-7222
C18	00G-3109-E0	00G-3109-N0	00G-3109-P0	AJO-4287	AJO-7221
NH ₂	00G-3190-E0	00G-3190-N0	—	AJO-4302	AJO-7364

for ID: 3.2-8.0mm 9-16mm

10µ Columns (continued)			Guards
Phases	250 x 50	250 x 100	50 x 50
Silica	00G-3105-V0	—	03B-3105-V0
C4	00G-3107-V0	00G-3107-W0	03B-3107-V0
C8	00G-3108-V0	00G-3108-W0	03B-3108-V0
C18	00G-3109-V0	00G-3109-W0	03B-3109-V0

16µ Columns (mm)			
Phases	250 x 10	250 x 21.2	250 x 50
C18	00G-3114-N0	00G-3114-P0	00G-3114-V0

10µ Bulk Packings				16µ Bulk Packings				
Phases	100g Order No.	Price	500g Order No.	Price	500g Order No.	Price	1kg Order No.	Price
Silica	04G-3105		04J-3105		04J-3110		04K-3110	
C4	04G-3107		04J-3107		04J-3112		04K-3112	
C8	04G-3108		04J-3108		04J-3113		04K-3113	
C18	04G-3109		04J-3109		04J-3114		04K-3114	
NH ₂	04G-3190		04J-3190		04J-3191		04K-3191	

 Other column dimensions available upon request.

 See p. 213 for Semi-prep SecurityGuard Cartridge Holders.

KROMASIL® CHIRAL COLUMNS

- Chiral network polymers covalently bonded to silica
- Two phases offer complimentary enantioselectivity
- Good selectivity for acidic and basic chiral compounds
- Chiral technology specifically available in larger particles engineered for scale-up to prep
- Good mechanical and chemical stability and loadability

Base Silica

Since the surface properties of the silica have a great impact on the enantioselectivity of the Chiral Stationary Phases, Kromasil® uses a uniform surface, high purity Kromasil premium silica.

Chiral Selectors

Two phases have been developed to compliment each other in selectivity:

Kromasil CHI-I

The chiral monomer is O,O'-bis (3,5-dimethylbenzoyl)-N,N'-diallyl-L-tartar diamide.

Kromasil CHI-II

The chiral monomer is O,O'-bis (4-tert-butylbenzoyl)-N,N'-diallyl-L-tartar diamide.

The chiral monomers are reacted with a multi-functional hydrosilane yielding a network polymer incorporating the bi-functional C2-symmetric chiral selector. The chiral polymer is then covalently bonded to functionalized silica.

Performance

Kromasil CHI-I and Kromasil CHI-II separate a broad range of racemates (see Table to the right). The phases are based on 5 and 10 μ particles for best efficiency. The smaller 5 μ materials are necessary for difficult separations and give sharp peaks in analytical separations. For preparative scale, 10 μ particles are excellent, giving high efficiencies and relatively low pressure drops for large ID columns. As with most Brush type chiral columns, the best selectivity is obtained under normal phase (hexane:IPA) conditions, however these phases are equally usable and stable under aqueous-based conditions.

Mechanical and Chemical Stability

Kromasil silica is one of the most mechanically stable of HPLC silicas. The high stability is given by the nature of the network polymer covalently bonded to the silica. Kromasil chiral phases can be used with most solvents and buffers in the mobile phase without degradation. TFA buffers can, under certain conditions, cause some hydrolysis of the phases.

Loadability

The high loading capacity of Kromasil chiral columns is due to the high surface area of the silica and the high chiral ligand density. The loading capacity in preparative scale is of course determined also by the separation factor, α .

Selected Applications on DATD Chiral Selectors CHI-I and II

Class	Separation Factor (α)	
	CHI-I	CHI-II
Benzodiazepinones		
Oxazepam	1.16	1.35
Lorazepam	1.48	1.60
Lopirazepam	1.64	1.57
Ketazolam	1.13	—
Camazepam	1.06	1.25
Temazepam	1.10	—
Profens		
Carprofen	—	1.63
Ketoprofen	1.10	1.25
Naproxen	—	2.04
Ibuprofen	1.12	1.76
Flurbiprofen	1.58	1.73
Benoxaprofen	—	1.72
Priprofen	—	1.73
Benzothiadiazines and related compounds		
Bendroflumethiazide	1.32	1.18
Paraflothizide	—	1.34
Epithiazide	1.21	—
Penfluthizide	1.25	—
Trichloromethiazide	1.30	—
Metolazone	1.29	—
Quinethazone	1.17	—
Amino Alcohols		
Metoprolol	1.14	—
Propranolol	1.06	—
Clenbuterol	1.12	1.23
Barbiturates		
Benzonal	1.18	—
Hexobarbital	1.19	—
Phenylphenobarbital	1.06	—
Hydantoins		
Mephentoin	1.43	—
Miscellaneous		
Morpholep	1.23	—
Glutethimide	1.08	—
Omeprazole	1.14	1.40
Warfarin	1.06	—
Chlorthalidone	1.69	—
Chormezanone	1.15	—
Mefloquine	1.71	—
Chloroquine	1.26	—
Desethylchloroquine	1.14	—
Baclophen-lactam	1.37	1.51
1,1'-Bi-(2-naphthol)	2.75	—
2-(Octylsulfanyl)-benzoic acid	1.57	—
1,1'-Spirobi[3H-2,1-benzoxathiol]-3,3'-dione	1.96	—
Bupivacaine	—	1.60
Carticaine	—	1.24
p-Chlorophenprocoumon	—	1.24
Etodolac	—	1.25
Indapamide	1.25	—
Metolazome	1.24	—
Oxamniquine	1.26	—
Phenprocoumon	—	1.15
Promethazine	—	1.32



See p. 108 for additional chiral stationary phases.

KROMASIL® CHIRAL COLUMNS

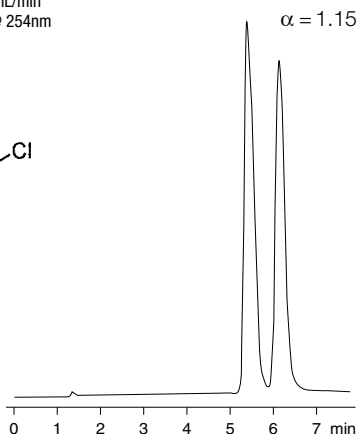
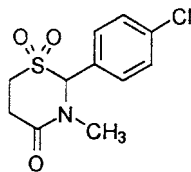
HPLC

Kromasil Chiral

App ID 5398

Chlormezanone

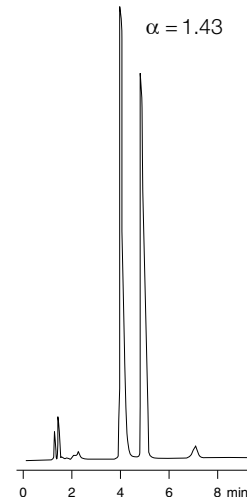
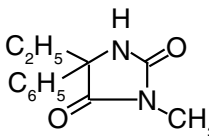
Phase: Kromasil CHI-I di-(3,5-dimethylbenzoyl)-L-DATD
Dimensions: 250 x 4.6mm
Order No.: CH0-3981
Mobile Phase: Hexane/IPA (85:15)
Flow Rate: 2.0 mL/min
Detection: UV @ 254nm
k_r: 3.03



App ID 5399

Mephénytoin

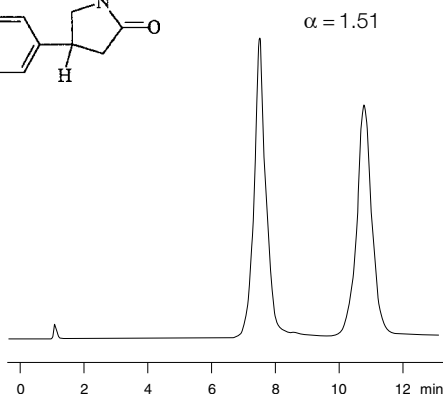
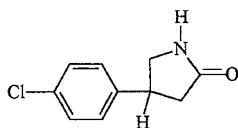
Phase: Kromasil CHI-I di-(3,5-dimethylbenzoyl)-L-DATD
Dimensions: 250 x 4.6mm
Order No.: CH0-3981
Mobile Phase: Hexane/IPA (95:5)
Flow Rate: 2.0 mL/min
Detection: UV @ 230nm
k_r: 1.93



App ID 5400

Baclophenlactam

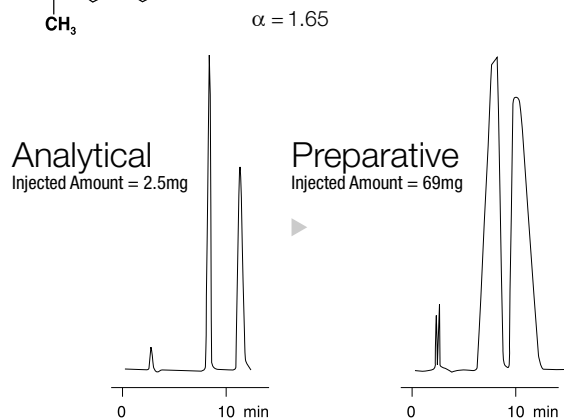
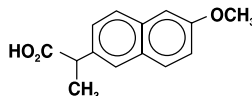
Phase: Kromasil CHI-II di-(4-tertbutylbenzoyl)-L-DATD
Dimensions: 250 x 4.6mm
Order No.: CH0-3982
Mobile Phase: Hexane/IPA (95:5)
Flow Rate: 2.0 mL/min
Detection: UV @ 254nm
k_r: 4.50



App ID 5401

Preparative Separation of (+,-) Naproxen

Phase: Kromasil CHI-II di-(4-tertbutylbenzoyl)-L-DATD
Dimensions: 250 x 10mm
Order No.: Inquire
Mobile Phase: Hexane/Acetone (92:8) + 1.0% acetic acid
Flow Rate: 4.7 mL/min



ORDERING INFORMATION

5μ Columns

Order No.	Column Description	Size (mm)	Price
CH0-3981	CHI-I 0,0'-bis (3,5-dimethylbenzoyl)-N,N'-diallyl-L-tartardiamide	250 x 4.6	
CH0-3982	CHI-II 0,0'-bis (4-tert-butylbenzoyl)-N,N'-diallyl-L-tartardiamide	250 x 4.6	



Phases are also available in 10μ particle sizes.