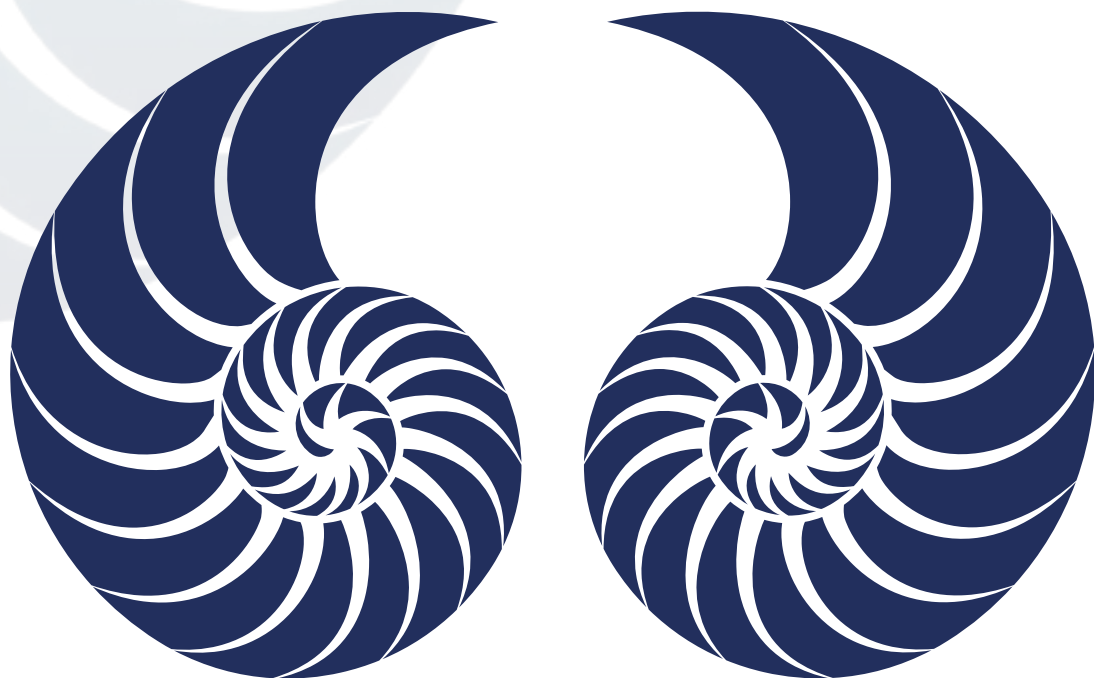


**Dr. Maisch**

Any Column, Any Size, Any Media

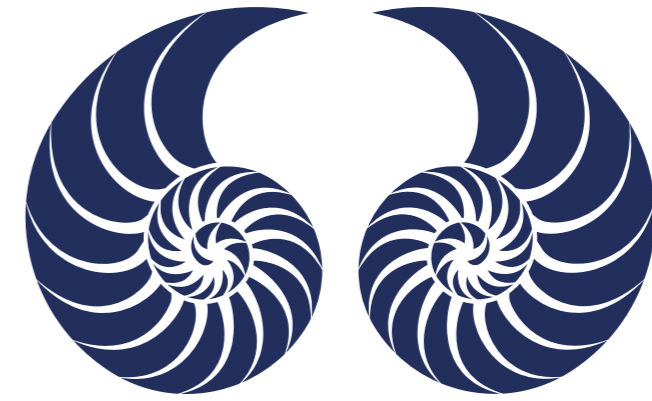


手性色谱柱

MADE BY DR. MAISCH

## 内容

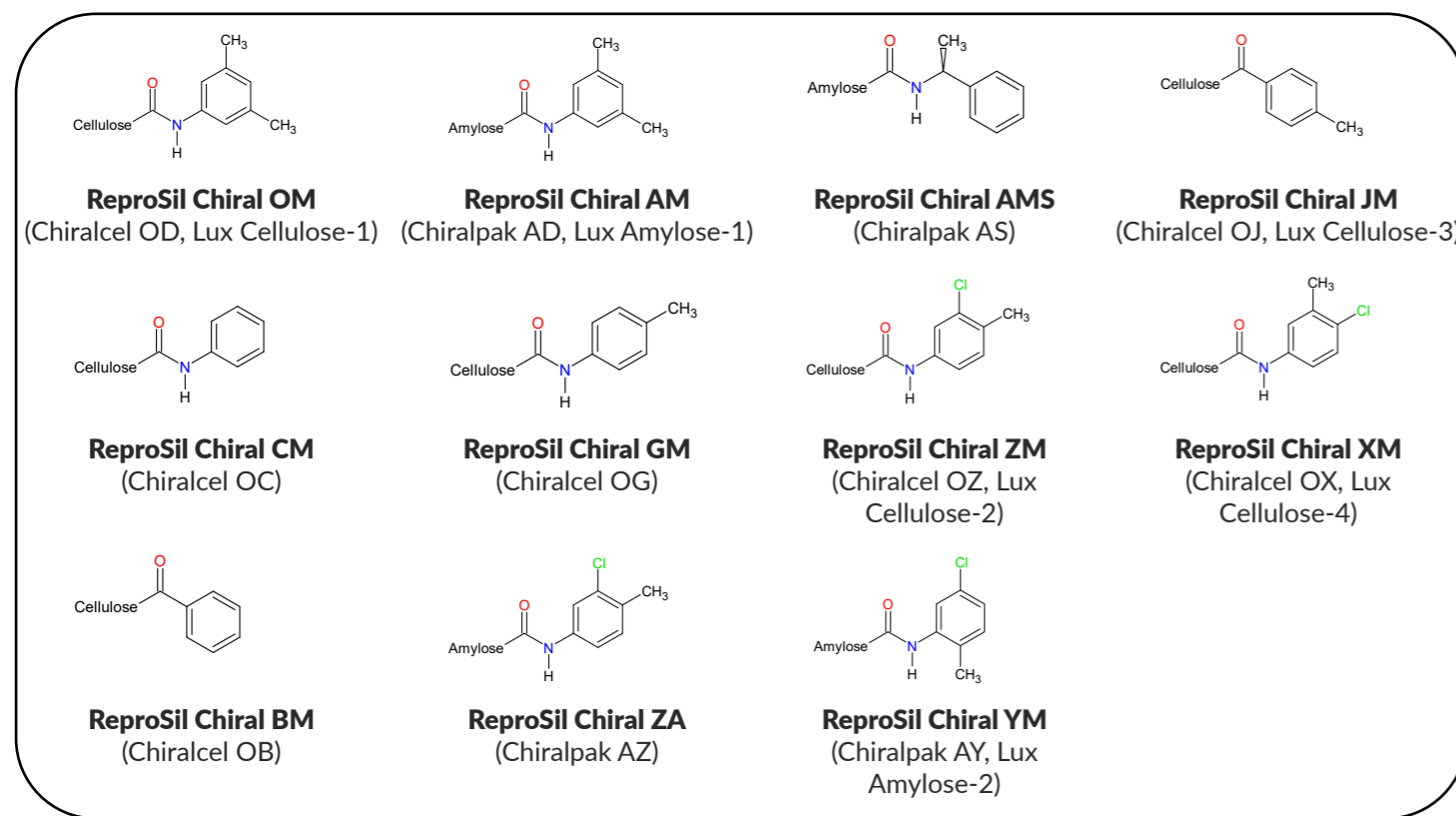
- P 4 - REPOSIL 手性固定相  
- 手性固定相名称和结构
- P 5 - 对应其他厂商参考表
- P 6-11 - Syame Khater和Caroline West进行的独立手性SFC研究
- P 12-13 - REPOSIL CHIRAL OM & CHIRACEL ODH的对比
- P 14-15 - JM与OJ的选择性对比 ( USP-L80 )
- P 16-18 - Reprosil手性柱与竞争对手同类型手性柱的比较
- P 19 - 典型的流动相条件和溶剂
- P 20-21 - REPOSIL CHIRAL NR 和 NR-R
- P 22 - REPOSIL CHIRAL - AGP
- P 23-24 - 手性制备柱
- P 25-30 - 可提供的类型和产品编号



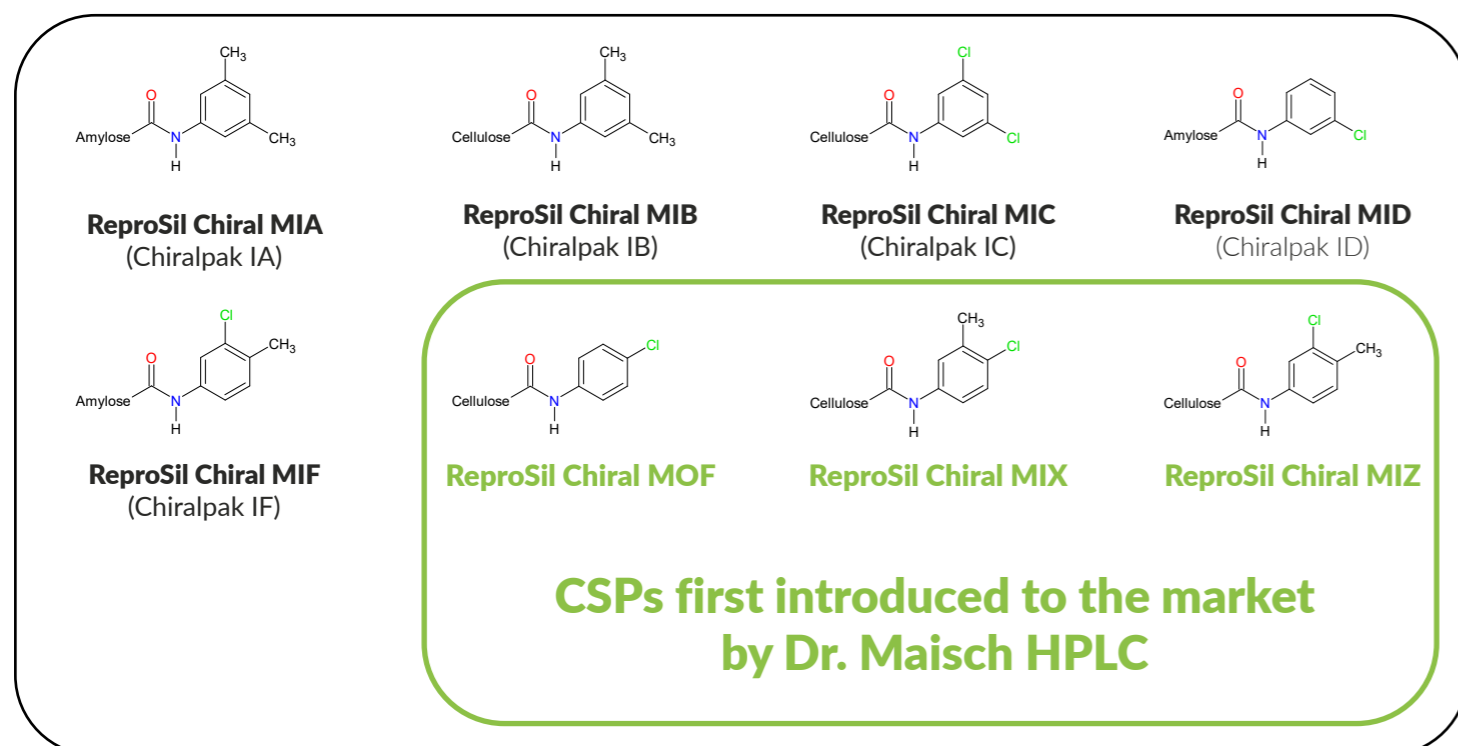
CHIRAL COLUMNS  
MADE BY DR. MAISCH

来自欧洲最大的高效液相色谱柱 (HPLC) 制造商之一

涂敷型REPROSIL CHIRAL固定相



键合型REPROSIL CHIRAL固定相



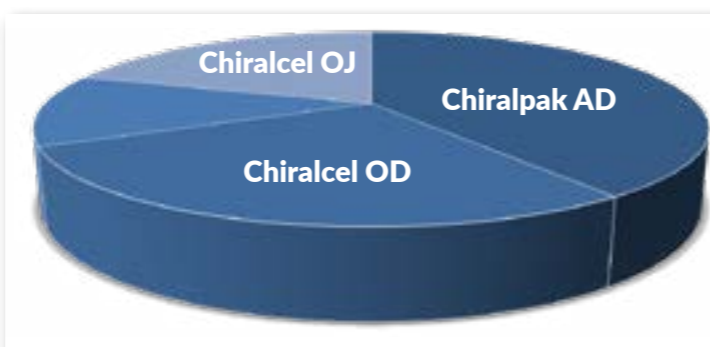
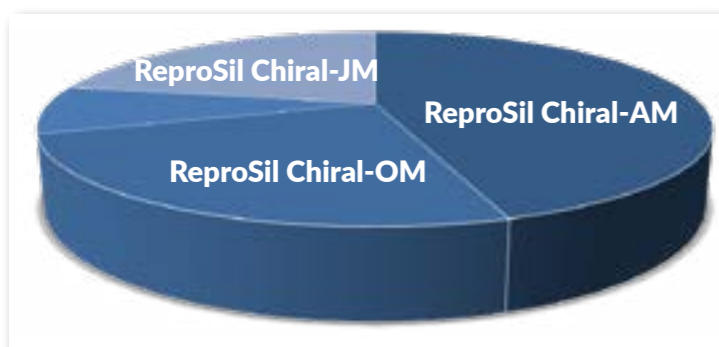
Dr Maisch phases	Daicel alternative	Phenomenex-alternative	Phase description
ReproSil Chiral-MIA	Chiralpak IA	Lux i-Amylose-1	直链淀粉三(3,5-二甲基苯基氨基甲酸酯)
ReproSil Chiral-MID	Chiralpak ID		直链淀粉三(3-氯苯基氨基甲酸酯)
ReproSil Chiral-MIF	Chiralpak IF		直链淀粉三(3-氯-4-甲基苯基氨基甲酸酯)
ReproSil Chiral-MOF			纤维素三(4-氯苯基氨基甲酸酯)
ReproSil Chiral-MIB	Chiralpak IB		纤维素三(3,5-二甲基苯基氨基甲酸酯)
ReproSil Chiral-MIC	Chiralpak IC	Lux i-Cellulose-5	纤维素三(3,5-二氯苯基氨基甲酸酯)
ReproSil Chiral-MIX			纤维素三(4-氯-3-甲基苯基氨基甲酸酯)
ReproSil Chiral-MIZ			纤维素三(3-氯-4-甲基苯基氨基甲酸酯)
ReproSil Chiral-AM	Chiralpak AD	Lux Amylose-1	直链淀粉三(3,5-二甲基苯基氨基甲酸酯)
ReproSil Chiral-AMS	Chiralpak AS		直链淀粉三(S)-1-甲基苄基氨基甲酸酯
ReproSil Chiral-YM	Chiralpak AY	Lux Amylose-2	直链淀粉三(5-氯-2-甲基苯基氨基甲酸酯)
ReproSil Chiral-ZA	Chiralpak AZ		直链淀粉三(3-氯-4-甲基苯基氨基甲酸酯)
ReproSil Chiral-BM	Chiralcel OB		纤维素三苯甲酸酯
ReproSil Chiral-CM	Chiralcel OC		纤维素三(苯基氨基甲酸酯)
ReproSil Chiral-GM	Chiralcel OG		纤维素三(4-甲基苯基氨基甲酸酯)
ReproSil Chiral-JM	Chiralcel OJ	Lux Cellulose-3	纤维素三(4-甲基苯基氨基甲酸酯)
ReproSil Chiral-OM	Chiralcel OD	Lux Cellulose-1	纤维素三(3,5-二甲基苯基氨基甲酸酯)
ReproSil Chiral-XM	Chiralcel OX	Lux Cellulose-4	纤维素三(4-氯-3-甲基苯基氨基甲酸酯)
ReproSil Chiral-ZM	Chiralcel OZ	Lux Cellulose-2	纤维素三(3-氯-4-甲基苯基氨基甲酸酯)

REPROSIL手性柱系列，相互补充，能够成功实现超过90%手性分析物的分离。

ReproSil Chiral AM, JM 和 OM 与竞争对手不分伯仲。

ReproSil CHIRAL COLUMNS

DAICEL CHIRAL COLUMNS



- ReproSil Chiral-AM
- ReproSil Chiral-OM
- Non resolved enantiomers
- ReproSil Chiral-JM

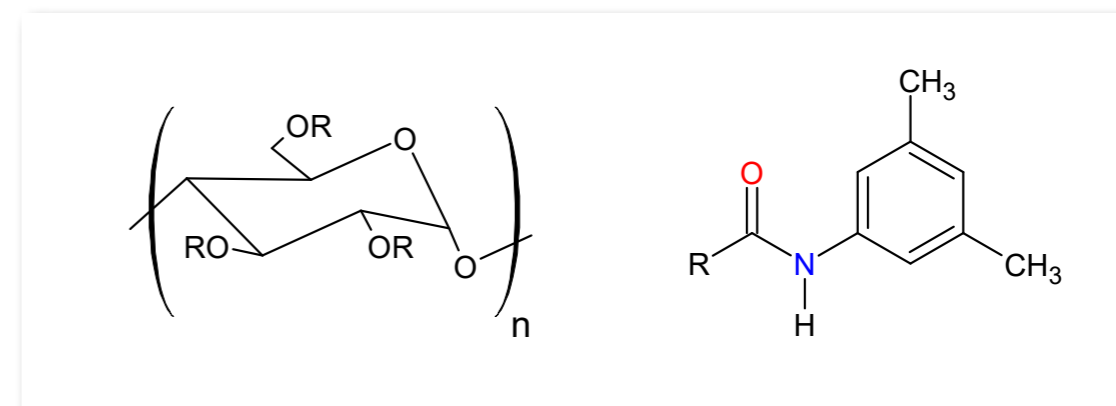
- Chiralpak AD
- Chiralcel OD
- Non resolved enantiomers
- Chiralcel OJ

REPROSIL CHIRAL OM与DAICEL CHIRAL OD的对比评估

使用纤维素三-(3,5-二甲基苯基氨基甲酸酯)修饰的硅胶相“ReproSil Chiral-OM”在超临界流体色谱中的评估。  
Syame Khater和Caroline West, 奥尔良大学, CNRS UMR 7311, ICOA。

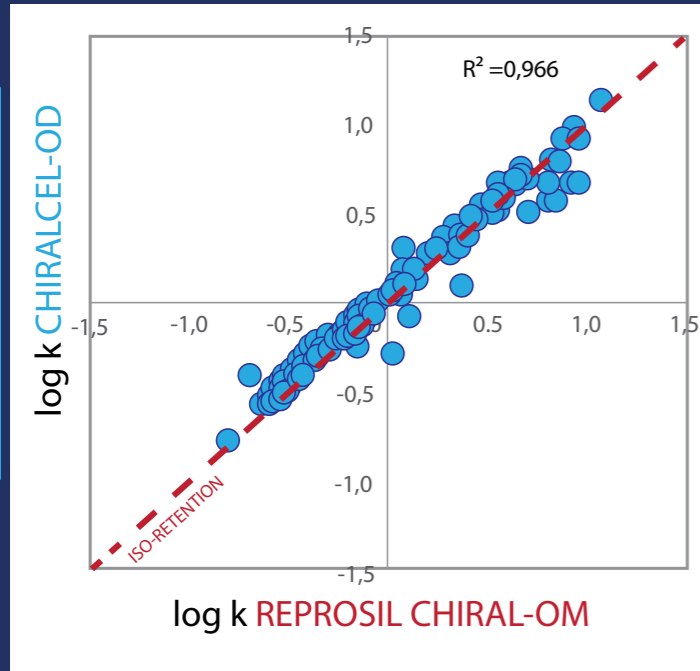
所有实验均在Jasco SFC系统和Acquity UPC<sup>2</sup>系统上进行。ReproSil Chiral-OM是基于涂有纤维素的三-(3,5-二甲基苯基氨基甲酸酯)的硅胶。在以下操作条件下，使用SFC对230种非手性化合物和130种手性对映体化合物进行了筛选：CO<sub>2</sub>/MeOH (90:10)，流速3 ml/min，柱温25° C，出口压力150 bar。

非特异性相互作用和保留



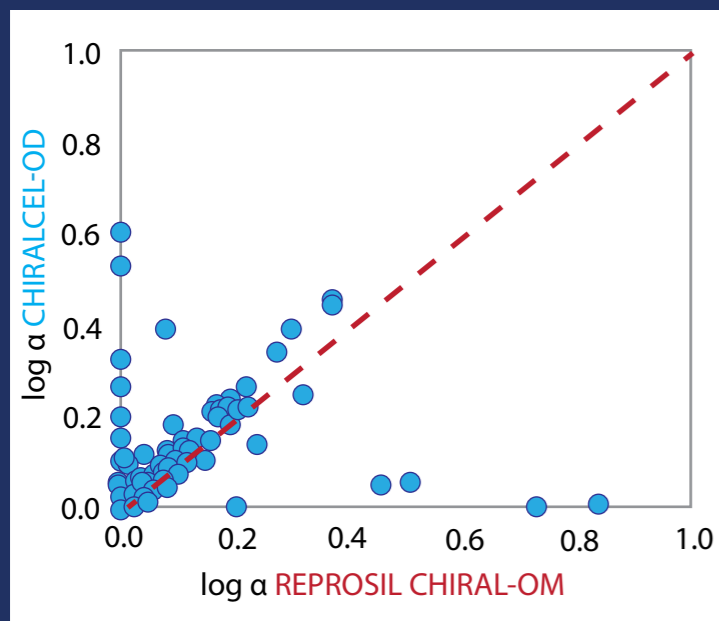
纤维素三-(3,5-二甲基苯基氨基甲酸酯)上的保留可以通过非特异性相互作用来解释，如 - 相互作用、氢键和空间选择性的相互作用。

Log k CHIRALCEL-OD



Log k RepoSil Chiral-OM

Log α CHIRALCEL-OD



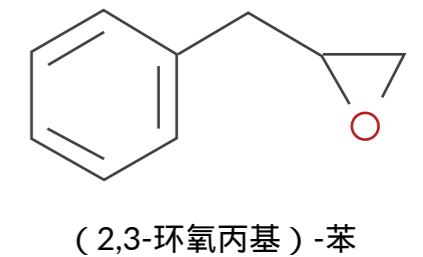
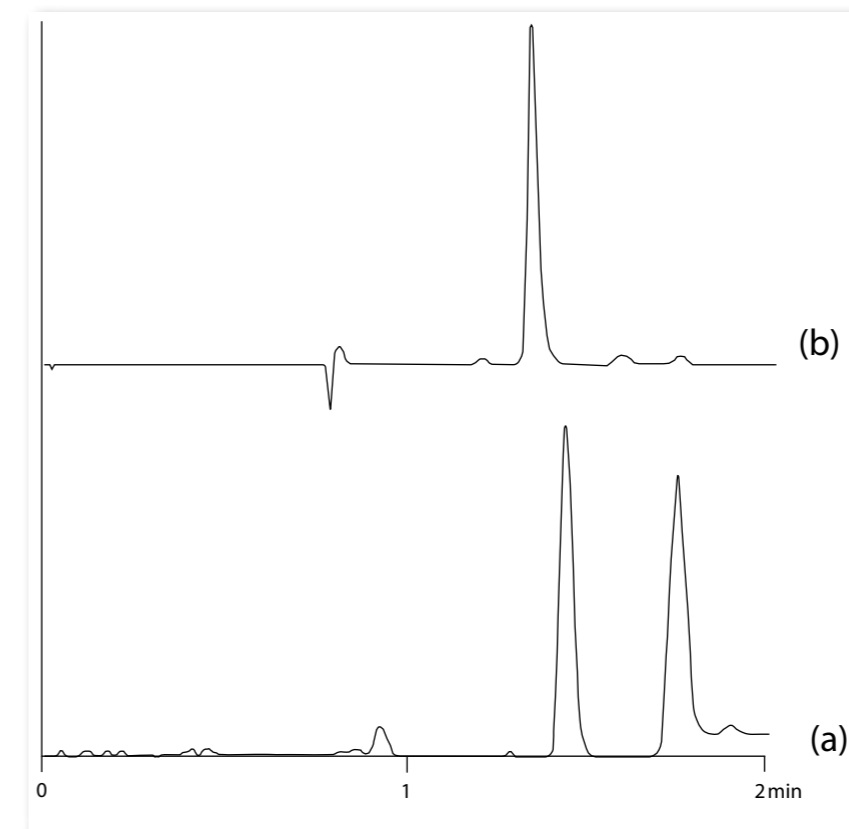
Log α RepoSil Chiral-OM

关于控制保留的非特异性相互作用的研究是基于230种非手性化合物的分析。左图比较了168种非手性物质在Chiralcel-OD和ReproSil Chiral-OM上的保留因子的对数。由于它们具有相同的色谱选择剂 ( $R^2=0.966$ )，因此预期它们的相位相似。它们将提供相似的非特异性相互作用。

下面的图比较了在ReproSil Chiral-OM与Chiralcel-OD上测量的130种对映体的分离因子的对数。大部分化合物位于虚线上，表明这两种柱子的分离行为相似。Chiralcel-OD提供了更多的独特结果。实际上，81%的测试过的手性物种在ReproSil Chiral-OM上得到解析，而在Chiralcel-OD上为86%。然而，有些对映体在ReproSil Chiral-OM上分离得很好，而在Chiralcel-OD上几乎没有分离。

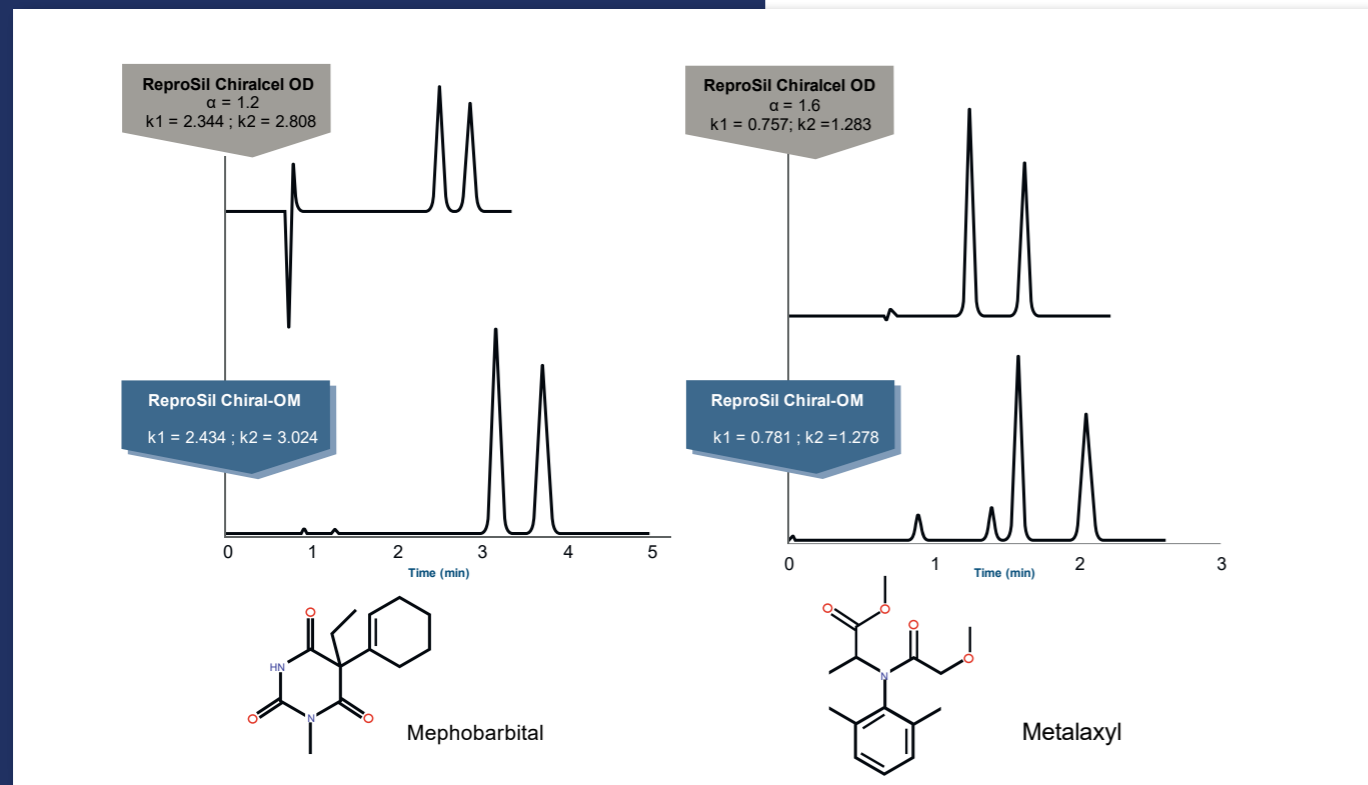
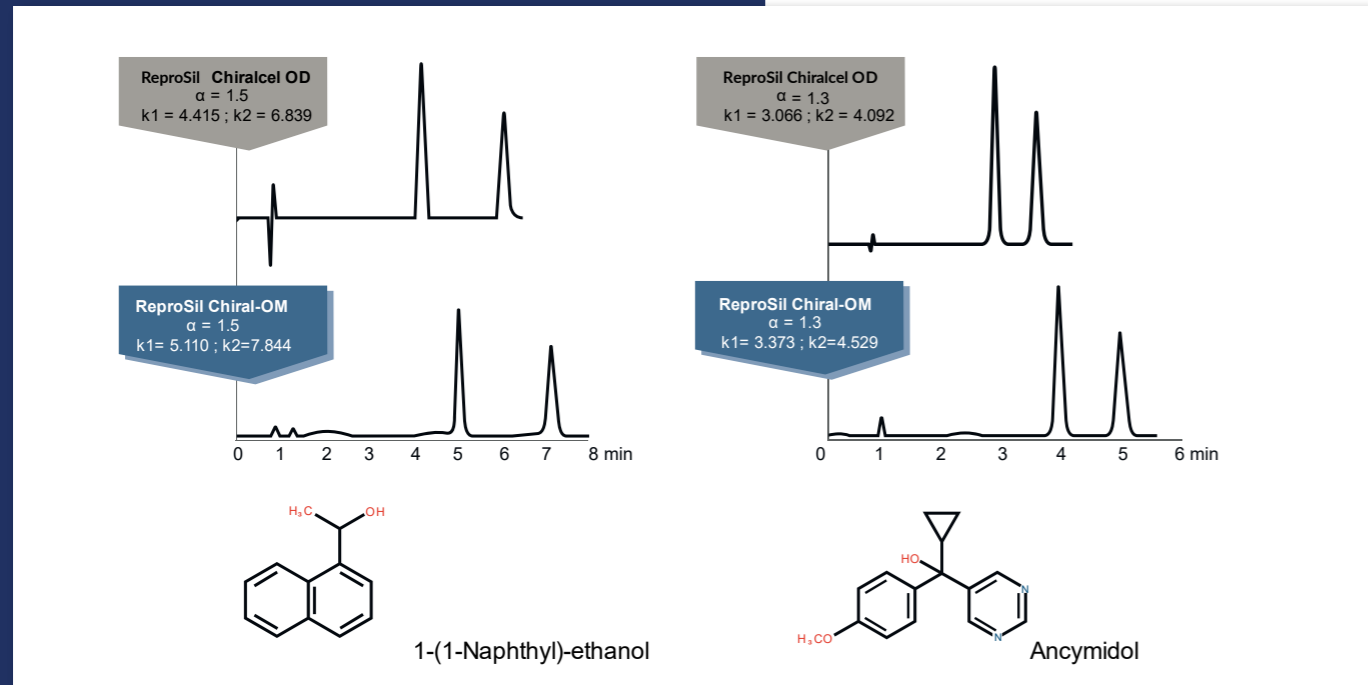
所有实验均在Jasco SFC系统和Acquity UPC<sup>2</sup>系统上进行。ReproSil Chiral-OM基于涂有纤维素的三-(3,5-二甲基苯基氨基甲酸酯)的硅胶。在以下操作条件下，使用SFC对230种非手性化合物和130种手性对映体化合物进行了筛选：CO<sub>2</sub>/MeOH (90:10)，流速3 ml/min，柱温25°C，出口压力150 bar。

以下色谱图展示了在方法开发过程中，使用纤维素三(3,5-二甲基苯基氨基甲酸酯)作为手性固定相的补充：重点关注ReproSil Chiral-OM与Chiralcel-OD对比，色谱图显示了在ReproSil Chiral-OM (a)上得到良好分离的手性化合物，但在Chiralcel-OD (b)上没有分离。

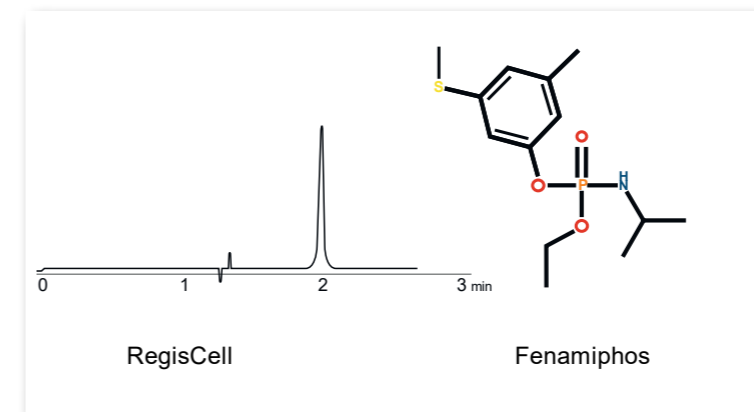


REPROSIL CHIRAL-OM 和 REPROSILCHIRALCEL OD的对比

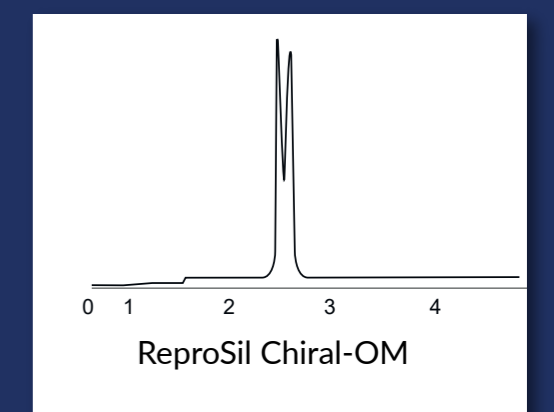
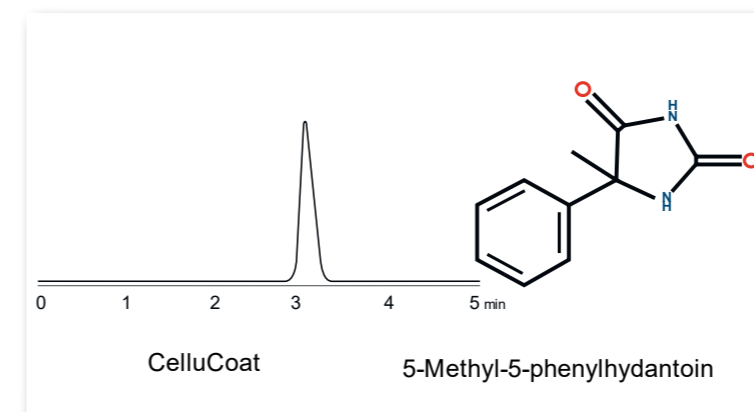
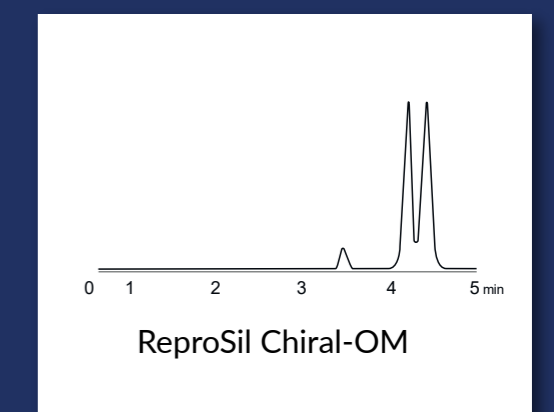
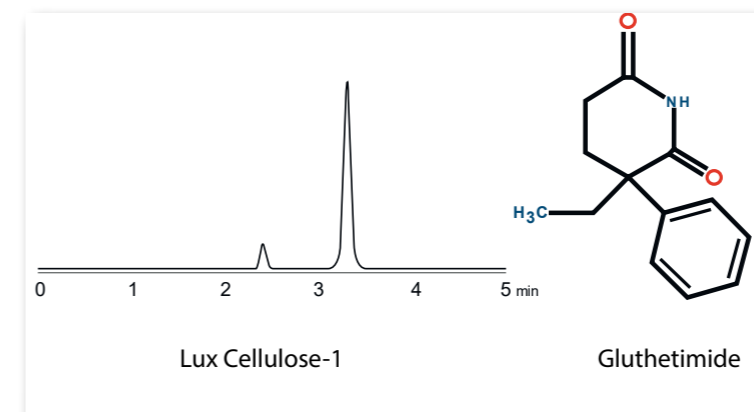
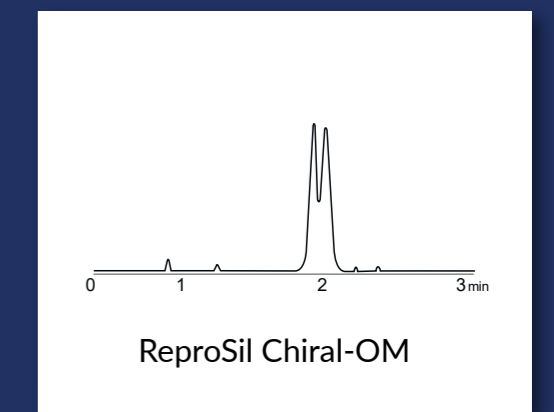
对苯胺磷、葡乙酰亚胺和5-甲基-5-苯基海因酸在ReproSil Chiral-OM上的分析，为方法开发提供了一个比在RegisCell、Lux Cellulose-1或Cellucoat上更好的起点。



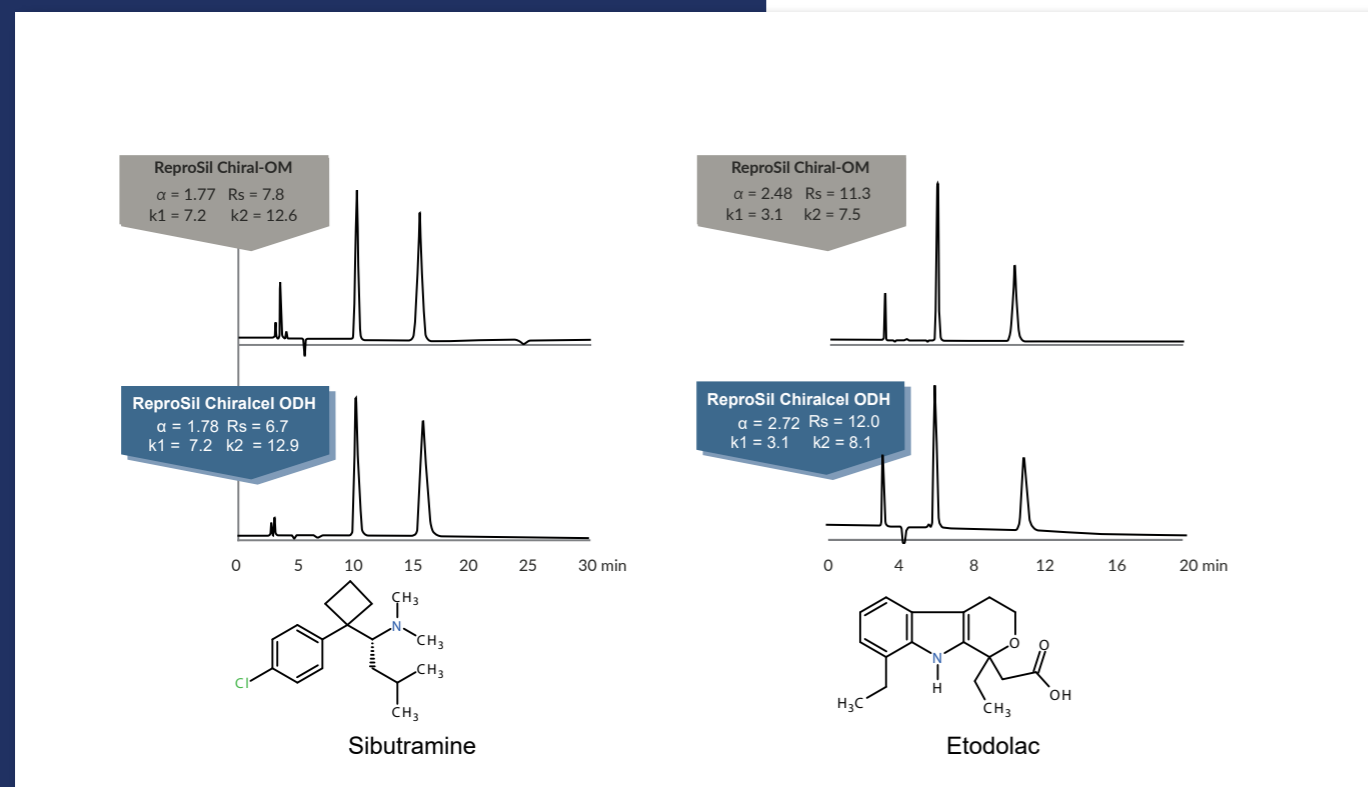
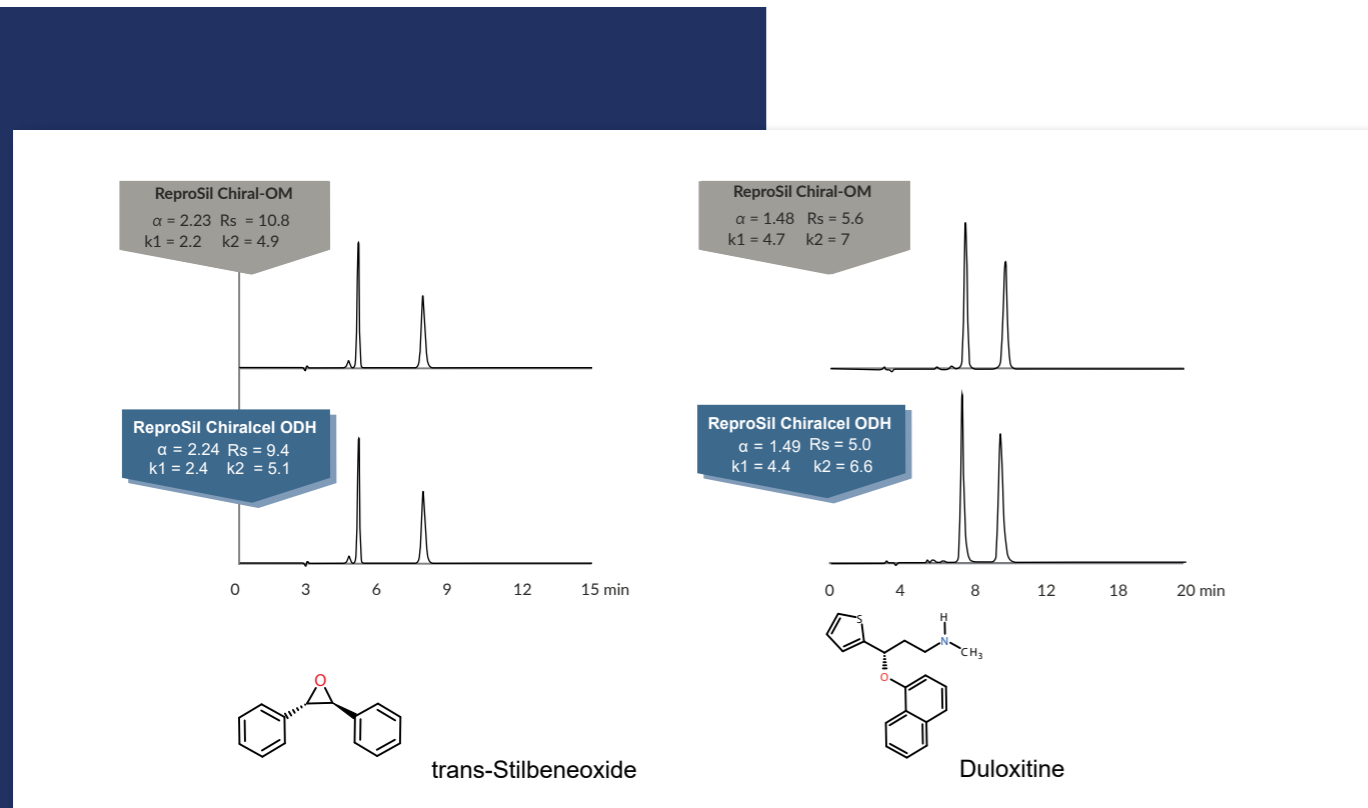
无分离



分离



REPROSIL CHIRAL-OM & CHIRACEL ODH



结论

Reprosil Chiral-OM 是 Chiralcel-ODH 高效液相色谱柱的绝佳替代品。

OBSERVATION

01.

在碱性、中性或酸性条件中使用的色谱柱的选择性是相同的

02.

使用ReproSil Chiral-OM柱在碱性和中性条件下对异构体的分辨率更高，而在酸性条件下，Chiralcel ODH显示略微更高的分辨率。

03.

在所有三种条件下（即酸性、碱性或中性），ReproSil Chiral-OM柱的峰对称性更好。

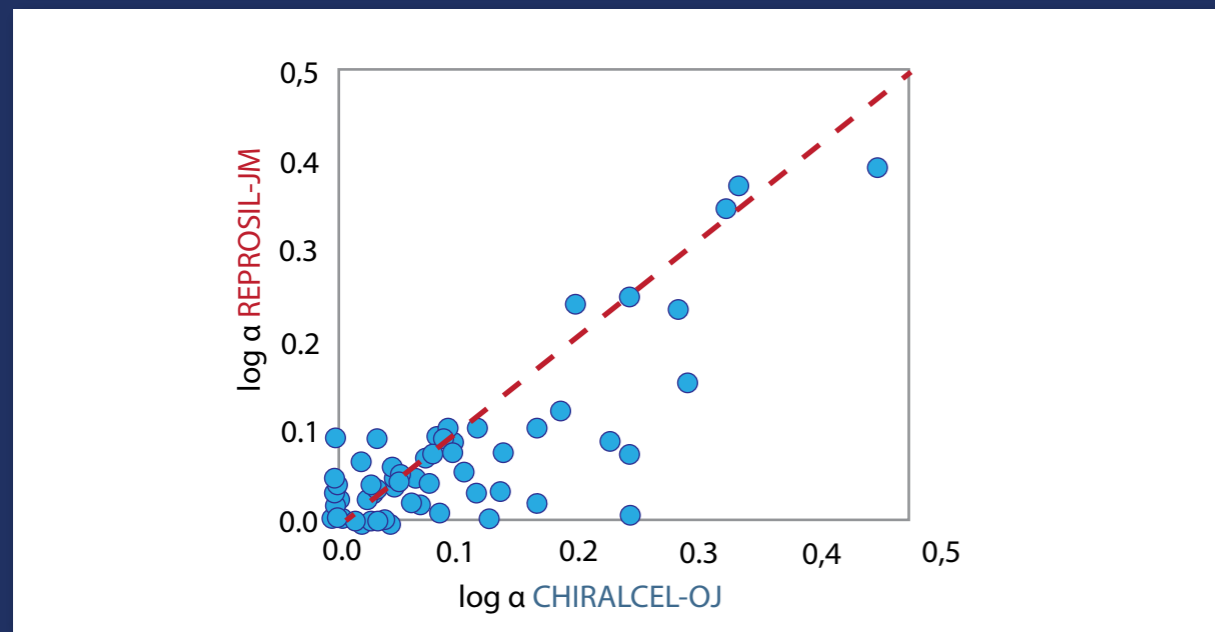
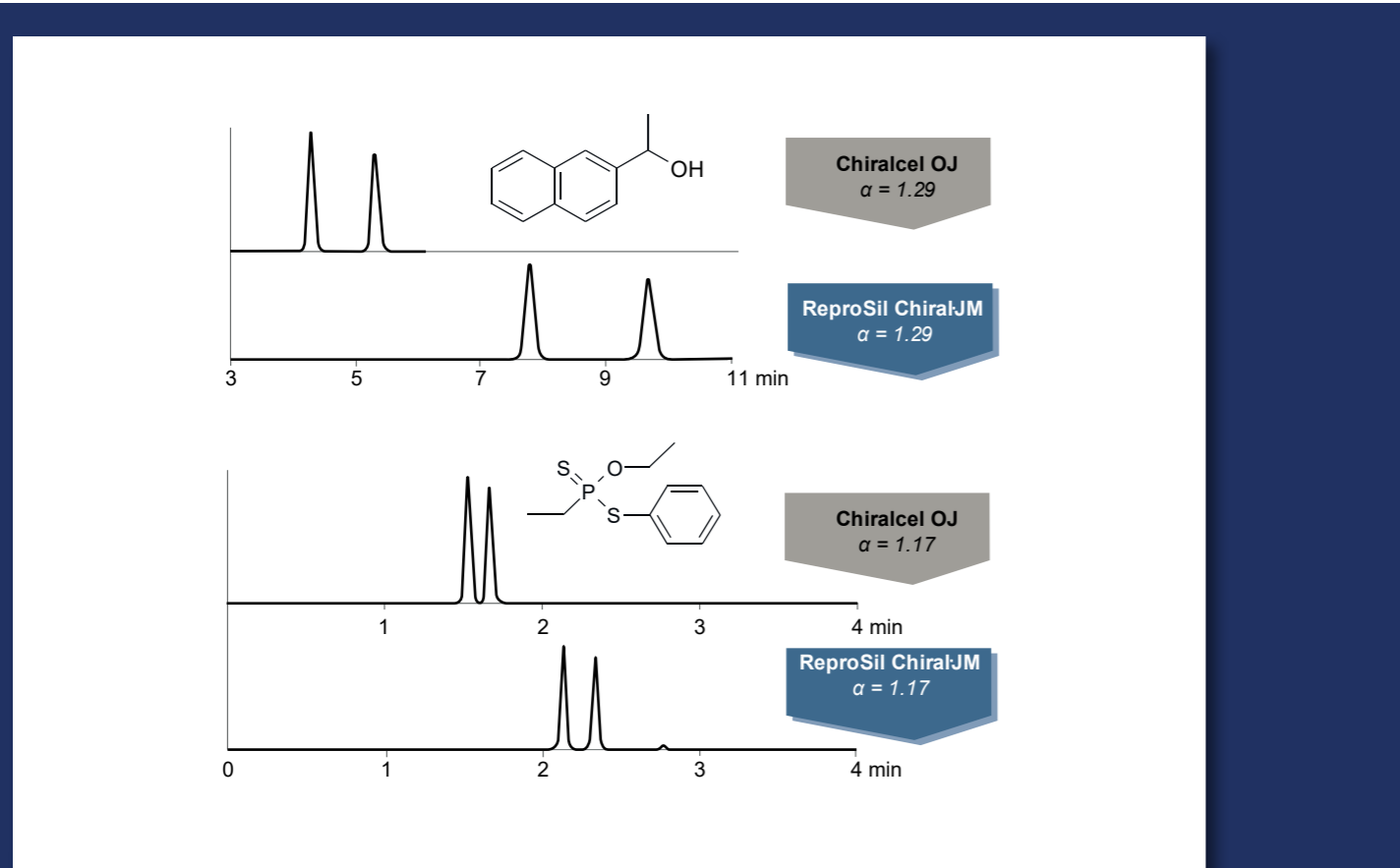
04.

在所有条件下，ReproSil Chiral-OM 显示出更高的理论塔板数。

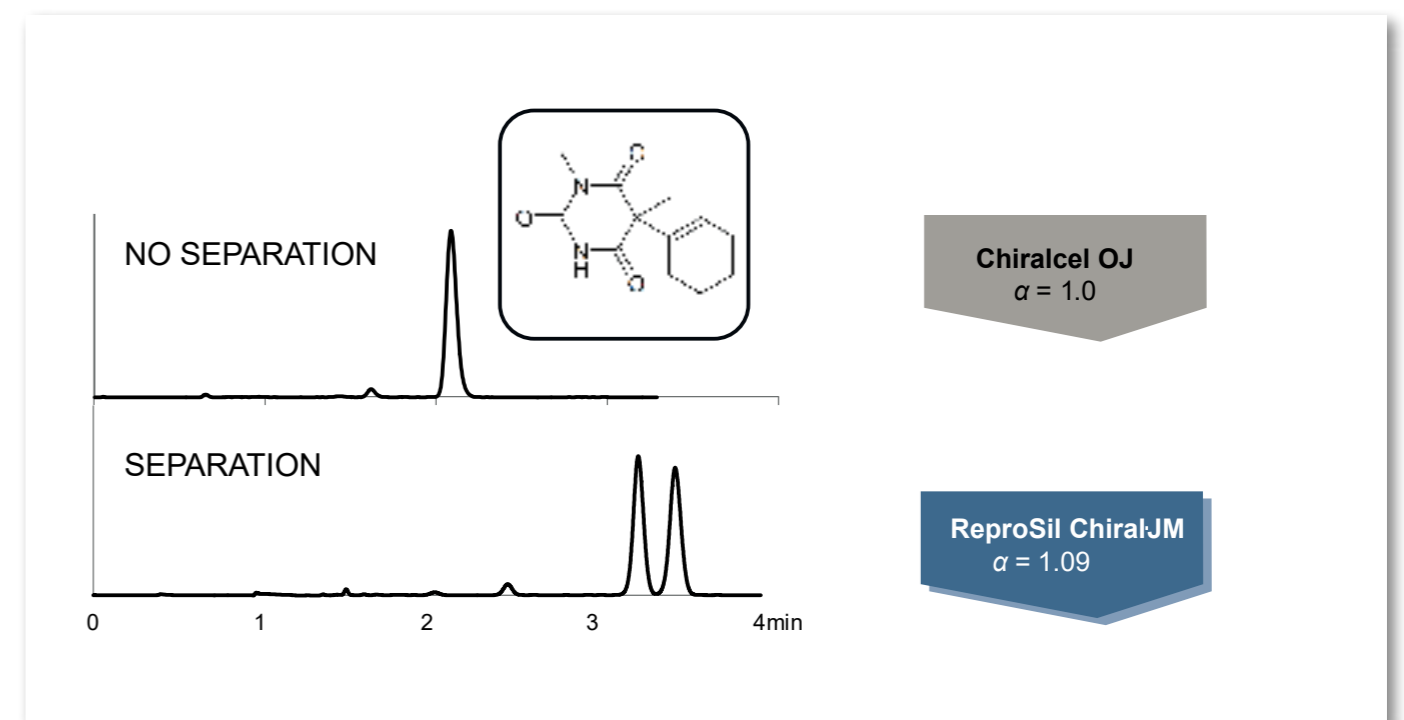
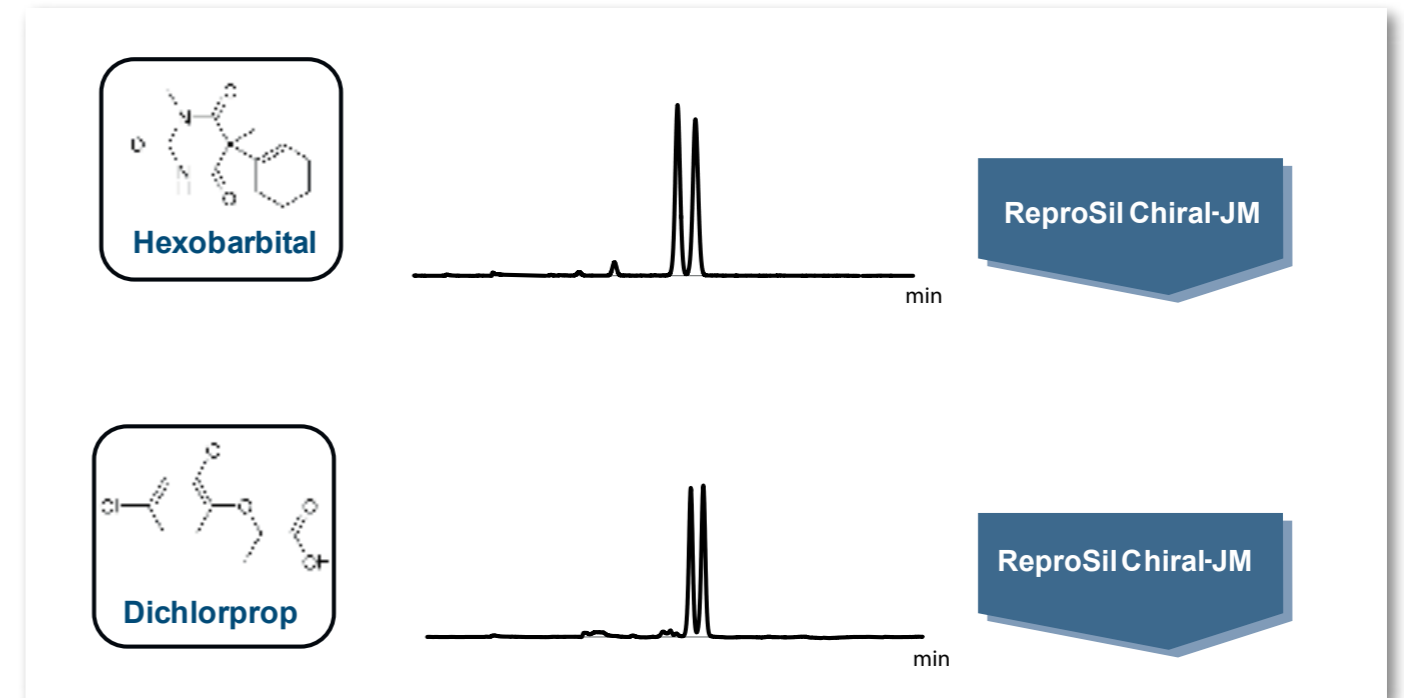
# SELECTIVITY OF JM vs. OJ (USP-L80)

$\log \alpha - \log \alpha$ 图比较了JM和OJ的选择性能力。

位于第一分界线（红色虚线）上的数据点显示出相似的分离轮廓。1-(2-萘基)-乙醇和地虫磷的色谱图展示了在两根柱子上具有相同分离因子。



在方法开发中，使用ReproSil Chiral-JM分析环己巴比妥，比Chiral-OJ提供了更好起点。



# 手性固定相的对比

## ReproSil Chiral – 独特的固定相

SAMPLES

Sample: Customer sample

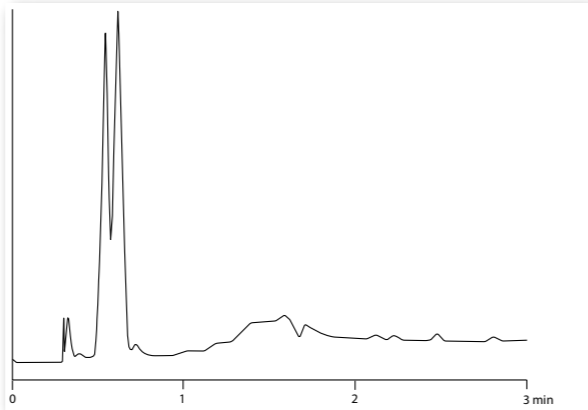
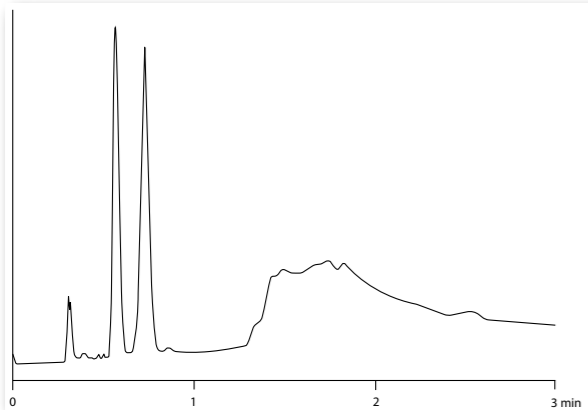
Eluent: CO<sub>2</sub>/0 - 20% MeOH (0.1% DEA) in 2 min

**ReproSil Chiral MIX**

5 μm, 100 x 3.0 mm

**Lux Cellulose-4**

3 μm, 100 x 4.6 mm



	RT	Areas	%Areas	Resolutions	USP Tailing
1	0,564	220320	39,72		1,20
2	0,726	334417	60,28	2,26	1,04

	RT	Areas	%Areas	Resolutions	USP Tailing
1	0,547	647055	44,58		
2	0,626	804384	55,42	0,97	

Sample: TSO

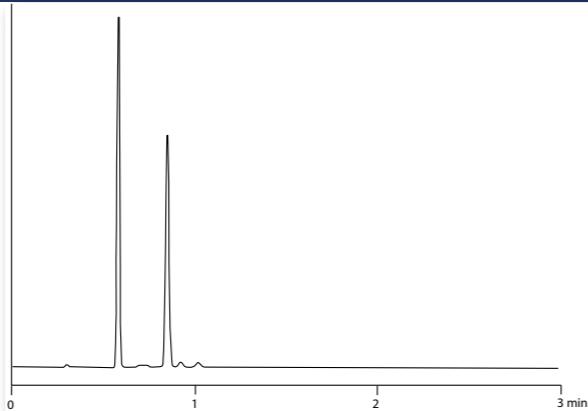
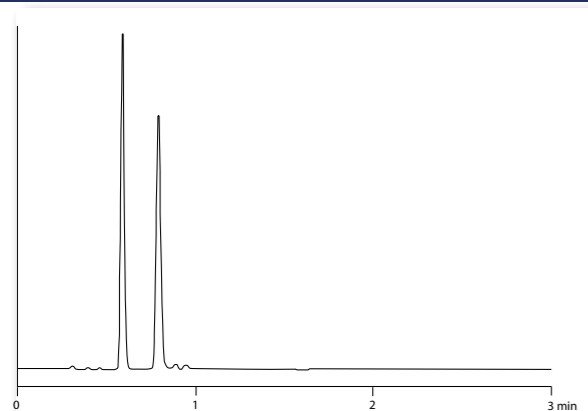
Eluent: CO<sub>2</sub>/ 10% MeOH (0.1% DEA)

**ReproSil Chiral MIX**

5 μm, 100 x 3.0 mm

**Lux Cellulose-4**

3 μm, 100 x 4.6 mm



	RT	Areas	%Areas	Resolutions	USP Tailing
1	0,588	1970619	49,64		1,13
2	0,789	1999432	50,36	4,97	1,11

	RT	Areas	%Areas	Resolutions	USP Tailing
1	0,583	1038369	49,91		1,05
2	0,851	1041945	50,09	8,89	1,04

# 手性固定相的对比

## ReproSil Chiral – 独特的固定相

SAMPLES

Sample: Customer sample

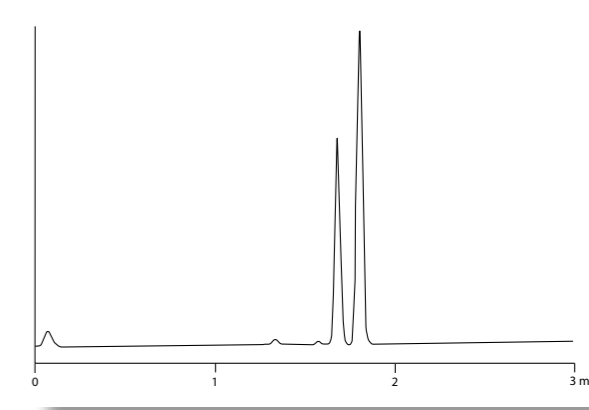
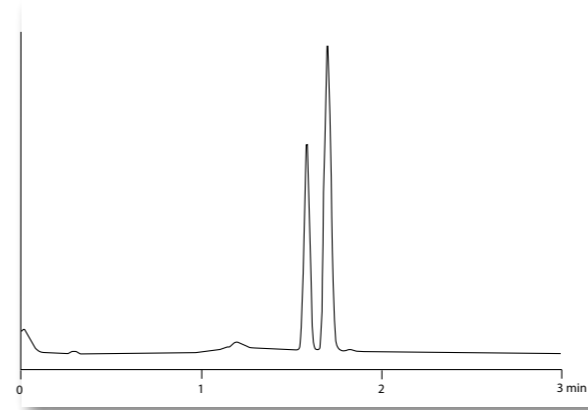
Eluent: CO<sub>2</sub>/ 10-50% MeOH (0.1% DEA) in 2 min, hold until 5 min

**ReproSil Chiral MIZ**

3 μm, 100 x 3.0 mm

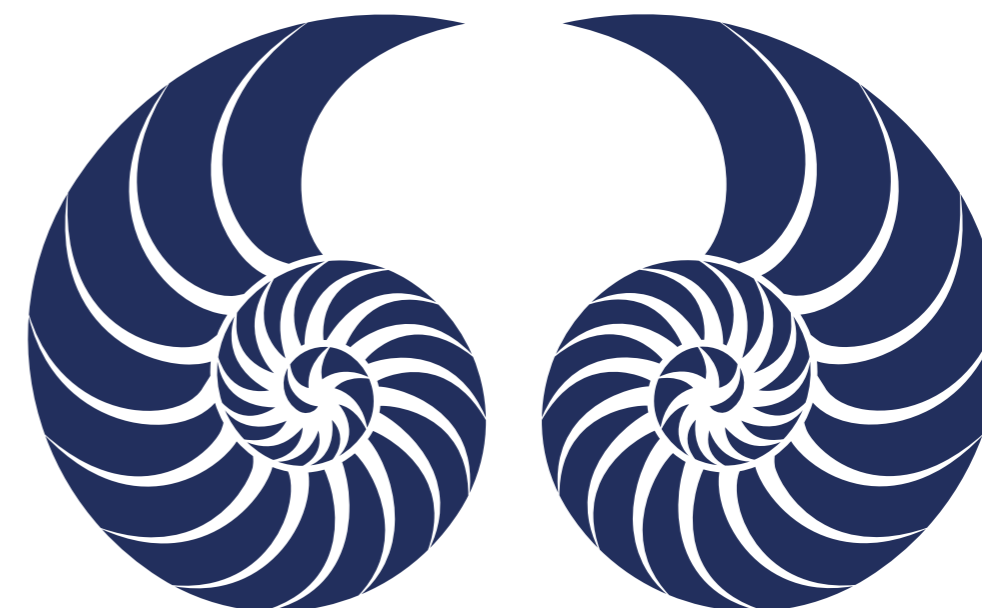
**Lux Cellulose-2**

3 μm, 50 x 4.6 mm



	RT	Areas	%Areas	Resolutions	USP Tailing
1	1,585	1872263	36,75		1,06
2	1,699	3221889	36,25	1,77	1,09

	RT	Areas	%Areas	Resolutions	USP Tailing
1	1,678	1757077	36,89		1,05
2	1,801	3005764	63,11	2,00	1,06



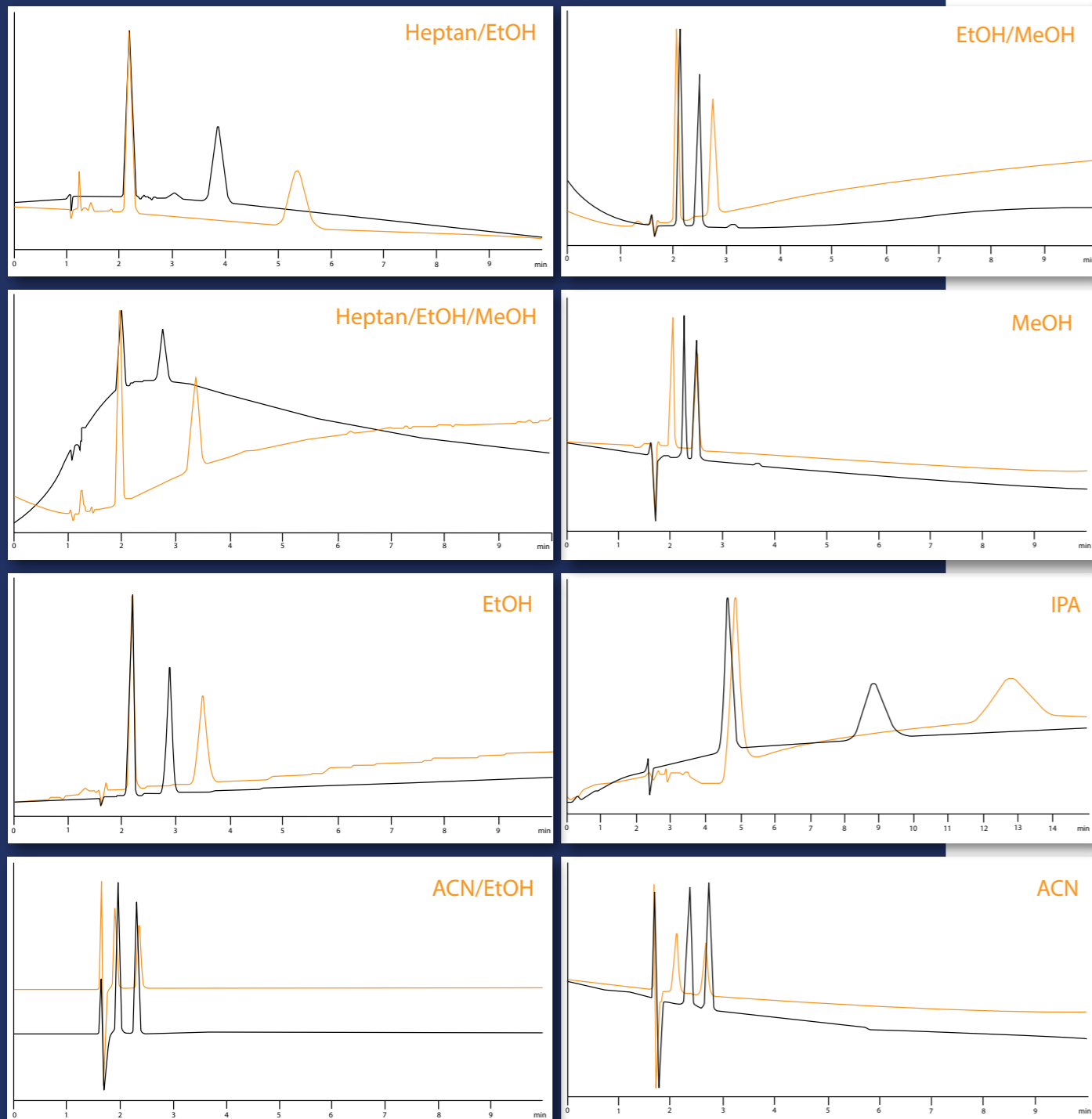
ReproSil Chiral MIX vs. Lux Cellulose-4 under NP/PO conditions

Customer sample

No additives used

Black: Lux Cellulose 4

Colour: ReproSil Chiral-MIX



正相条件

- 正己烷或庚烷与醇类 (乙醇, 异丙醇) 的混合物 = 80:20 (通过调整醇的百分比来调节保留时间和选择性)
- 对于碱性分析物添加0.1 – 0.5%的DEA或TEA, 对于酸性分析物添加0.1 – 0.5%的TFA或AcO。

极性有机相

- 乙腈/IPA混合物 (95/5) 或甲醇/IPA混合物 (90/10) 或纯乙腈
- 对于碱性分析物添加0.1 – 0.5%的DEA或TEA, 对于酸性分析物添加0.1 – 0.5%的TFA或AcOH。

反相条件

- ACN或MeOH或EtOH/水混合物
- 水相比例必须 < 85%
- 添加0.5-1 N的高氯酸或0.1%的TFA (对于碱性化合物) 以及HClO4/NaClO4缓冲液 (对于酸性化合物) 与ACN (乙腈) 混合。

• 在反相条件下使用专用色谱柱, 因为溶剂切换很繁琐

涂敷型手性相的溶剂兼容性

由于涂敷型手性相并非通过化学键与硅胶载体结合, 而是通过物理吸附, 因此强溶剂可以将聚合物从硅胶载体上剥离, 即使在微量或作为注射溶剂时也必须避免使用。这类强溶剂包括:

- 包括四氢呋喃在内的醚类
- 丙酮
- 氯化溶剂
- 乙酸乙酯
- 二甲基亚砷
- N,N-二甲基甲酰胺
- 甲苯
- 酮类
- 二甲基乙酰胺
- IPA > 50%

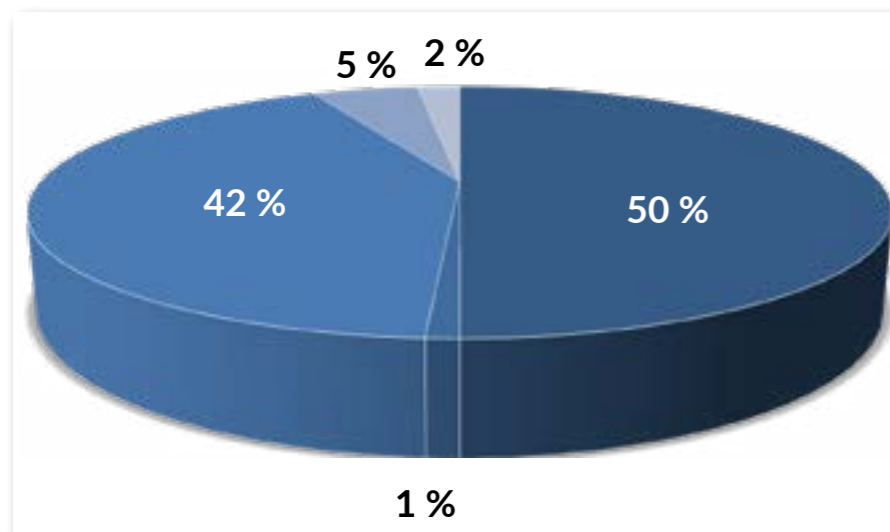
推荐的温度范围: 0 – 40° C  
推荐最大压力: 150Bar

- 新型刷式固定相
- 二硝基化合物、受体和电子供体相
- 特别适用于具有接近手性中心的O或N的芳香化合物。
- 适用正相,反相,SFC模式
- 洗脱顺序可逆

### Why ReproSil Chiral-NR?

- 在几分钟内从NP切换到RP
- 在所有常用HPLC洗脱液中可以稳定发挥
- 适用于多种分离模式和溶剂
- 可扩展性强
- 互补的选择性
- 洗脱顺序可逆

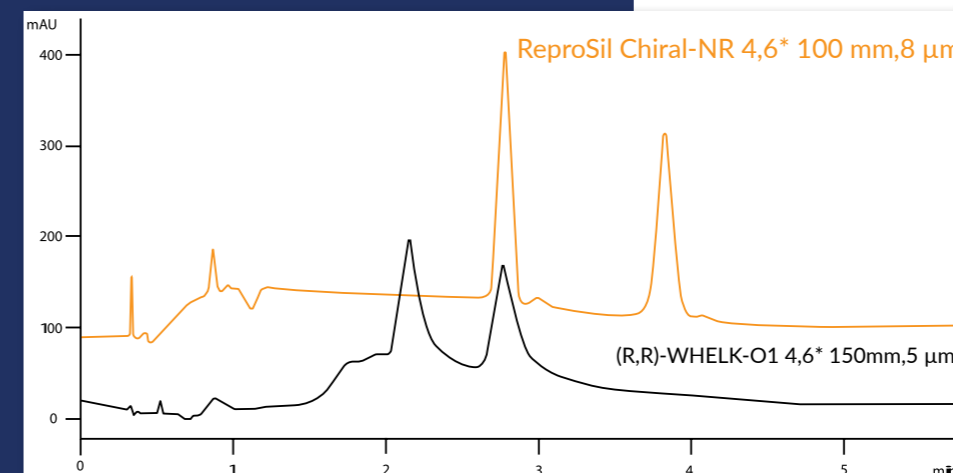
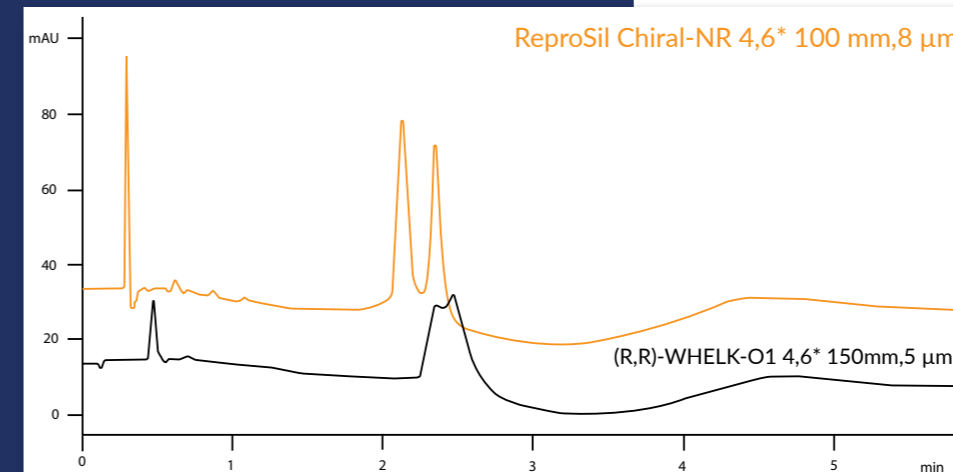
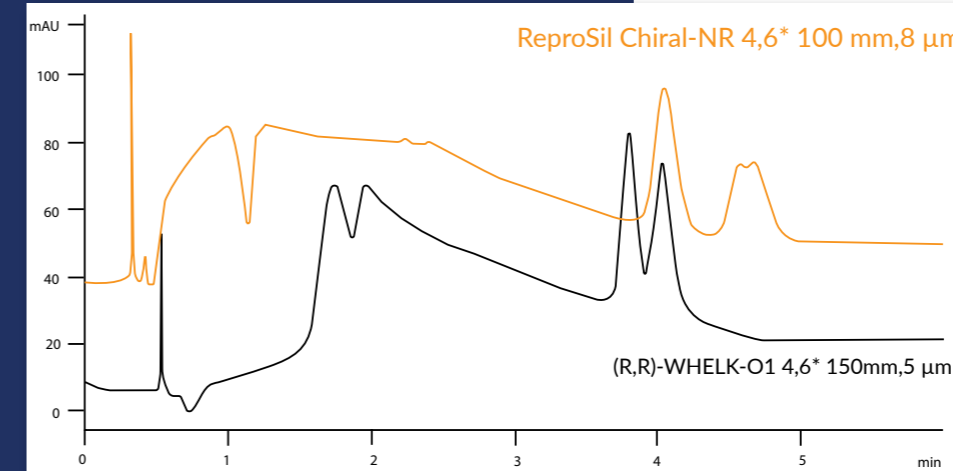
### CHIRAL PREPARATIVE SEPARATIONS WITH HPLC BY HOFFMANN LA ROCHE, BASEL IN 2014



- ReproSil Chiral-NR (50%)
- Chiralcel OD (1%)
- Chiralpak AD (42%)
- Lux-2 Amylose (5%)
- Lux-2 Cellulose (2%)

### ReproSil Chiral NR vs. Whelk-O1

COMPARISON



Co-Solvent:  
MeOH(0.1%DEA)

Gradient (B%):  
10% to 50% in 2.0 min.  
hold 1.0 min at 50%

Temperature: 35°C

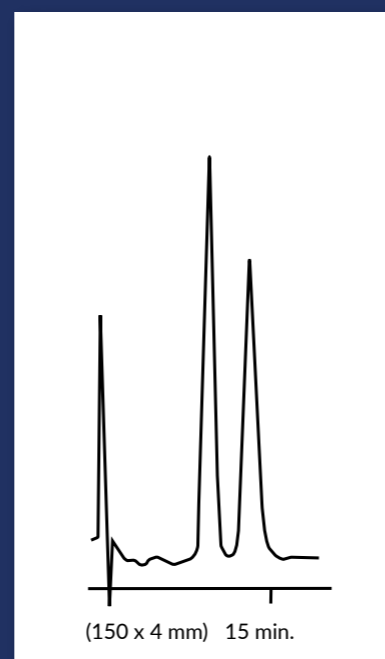
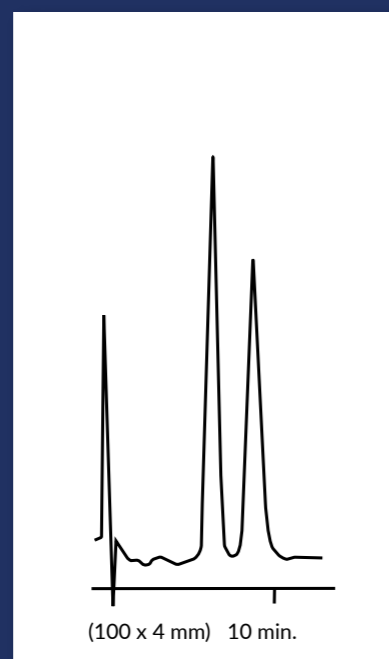
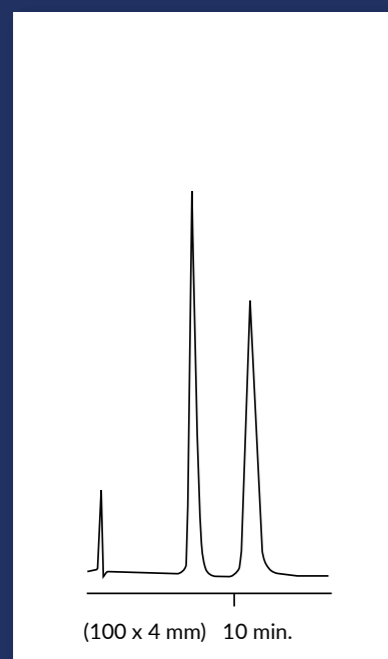
Flow (ml/min): 4

Back Pressure(psi):  
1500.00

Detector: 220nm

ReproSil Chiral-AGP, 5  $\mu$ m

ELUENTS



**Ibuprofen**

100 mM  
Na-phosphate buffer, pH7

**Warfarin**

10% -Propanol in 10 mM  
Na-phosphate buffer, pH7

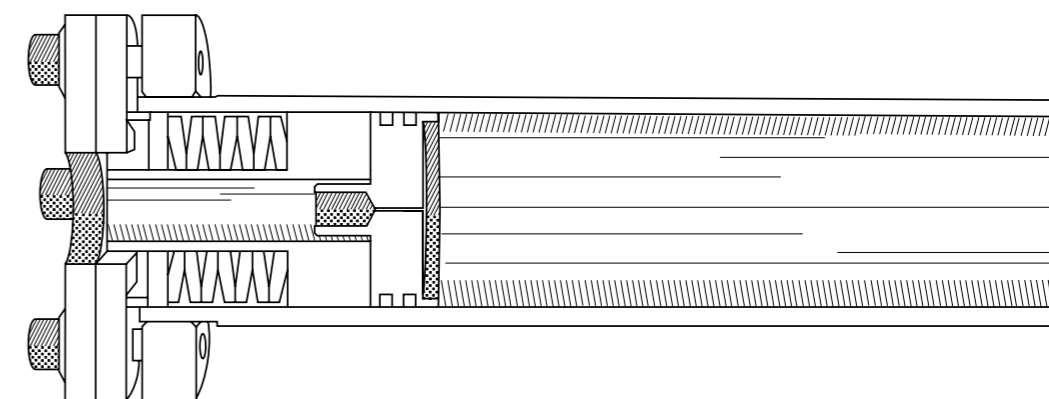
**Verapamil**

12% ACN in 10 mM  
Na-phosphate buffer, pH7

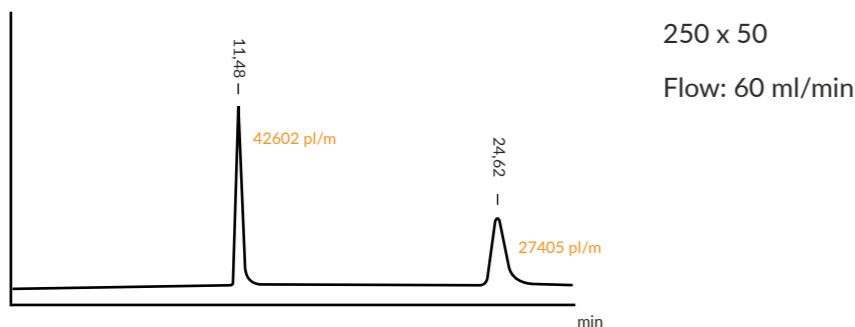
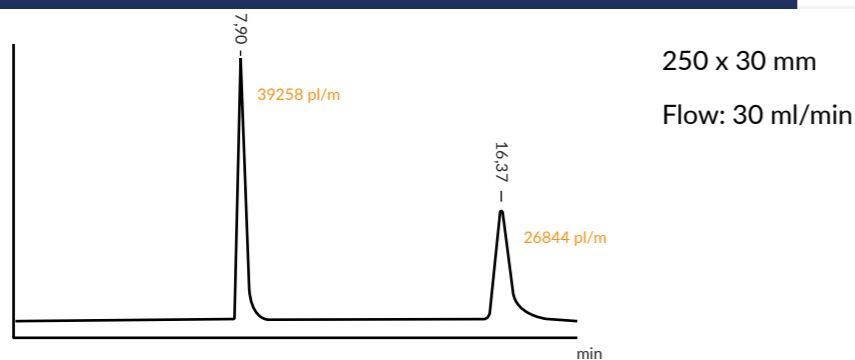
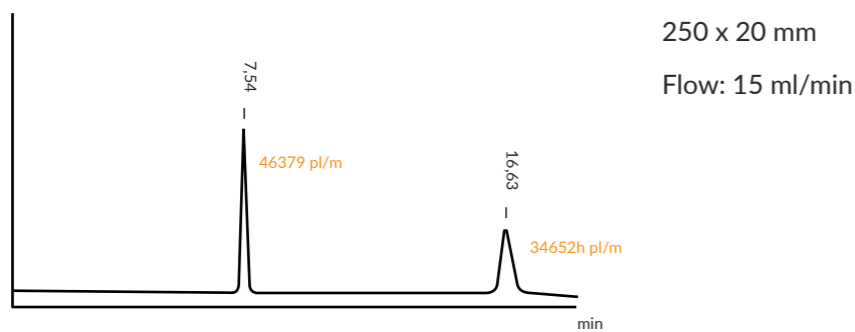
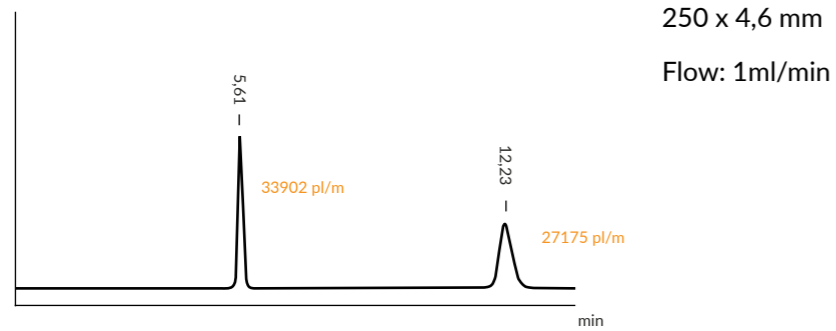
Technology patented by  
Dr. Maisch HPLC

市场上唯一集成了动态轴向压缩机  
制的预装柱

Available column IDs: 25 mm, 30 mm, 40 mm, 50 mm, 70 mm



ReproSil Chiral-NR, 8 µm upscaling



TEST CONDITIONS

Mobile Phase: Heptane/IPA 85/15  
Temperature: Ambient  
Pressure: 15 bar  
Detector: UV @ 229 nm  
Sensitivity: 0,1 mV

Mobile Phase: Heptane/IPA 85/15  
Temperature: Ambient  
Pressure: 9 bar  
Detector: UV @ 254 nm  
Sensitivity: 0,0 mV

Mobile Phase: Heptane/IPA 85/15  
Temperature: Ambient  
Pressure: 11 bar  
Detector: UV @ 254 nm  
Sensitivity: -0,8 mV

Mobile Phase: Heptane/IPA 85/15  
Temperature: Ambient  
Pressure: 12 bar  
Detector: UV @ 254 nm  
Sensitivity: -0,3 mV

Exemplary columns are mentioned below.

Columns with ID of: 4.0 mm, 3.0 mm and 2.0 mm are also available.

Immobilized Amylose-Phases

<b>ReproSil Chiral-MIA</b> Chiral-MIA, 5µm (or ReproSil Chiral-MIA-R)	<b>Amylose tris-(3,5-dimethylphenyl) carbamate</b> (Alternative to Daicel IA) 250 x 4.6 mm	150 x 4.6 mm	(PN: r65.mia) 100 x 4.6 mm
<b>ReproSil Chiral-MIF</b> Chiral-MIF, 5 µm (or ReproSil Chiral-MIF-R)	<b>Amylose tris-(3-Chloro-4-Methylphenyl) carbamate</b> (Alternative to Daicel IF) 250 x 4.6 mm	150 x 4.6 mm	(PN: r65.mif) 100 x 4.6 mm
<b>ReproSil Chiral-MID</b> Chiral-MID, 5 µm (or ReproSil Chiral-MID-R)	<b>Amylose tris-(3-Chlorophenyl) carbamate</b> (Alternative to Daicel ID) 250 x 4.6 mm	150 x 4.6 mm	(PN: r65.mid) 100 x 4.6 mm

Immobilized Cellulose-Phases

<b>ReproSil Chiral-MIB</b> ReproSil Chiral-MIB, 5 µm (or ReproSil Chiral-MIB-R)	<b>Cellulose tris-(3,5-dimethylphenyl) carbamate</b> (Alternative to Daicel IB) 250 x 4.6 mm	150 x 4.6 mm	
<b>ReproSil Chiral-MIC</b> ReproSil Chiral-MIC, 5 µm (or ReproSil Chiral-MIC-R)	<b>Cellulose tris-(3,5-Dichlorophenyl) carbamate</b> (Alternative to Daicel IC) 250 x 4.6 mm 250 x 10 mm	150 x 4.6 mm 250 x 20 mm	(PN: r65.mic) 100 x 4.6 mm
ReproSil Chiral-MIC, 3 µm (or ReproSil Chiral-MIC-R)	(Alternative to Daicel IC-3) 250 x 4.6 mm 100 x 4.6 mm	150 x 4.6 mm 50 x 4.6 mm	(PN: r63.mic) 125 x 4.6 mm 33 x 4.6 mm
<b>ReproSil Chiral-MIX</b> ReproSil Chiral-MIC, 5 µm (or ReproSil Chiral-MIX-R)	<b>Cellulose tris-(4-Chlor-3-Methylphenyl) carbamate</b> 250 x 4.6 mm	150 x 4.6 mm	(PN: r65.mix) 100 x 4.6 mm
<b>ReproSil Chiral-MIZ</b> ReproSil Chiral-MIZ, 5 µm (or ReproSil Chiral-MIZ-R)	<b>Cellulose tris-(3-Chlor-4-methylphenyl) carbamate</b> 250 x 4.6 mm	150 x 4.6 mm	(PN: r65.miz) 100 x 4.6 mm
ReproSil Chiral-MIZ, 3 µm (or ReproSil Chiral-MIZ-R)	250 x 4.6 mm 100 x 4.6 mm	150 x 4.6 mm 50 x 4.6 mm	(PN: r63.miz) 125 x 4.6 mm 33 x 4.6 mm

<b>ReproSil Chiral-MOF</b>	<b>Cellulose tris-(4-Chlorophenyl) carbamate</b>		
ReproSil Chiral-MOF, 5 µm (or ReproSil Chiral-MOF-R)	250 x 4.6 mm    150 x 4.6 mm	(PN: r65.mof)	100 x 4.6 mm

**Coated Cellulose Phases**

<b>ReproSil Chiral-OM</b>	<b>USP-L40, Cellulose tris-(3,5-dimethylphenyl-carbamate) mod. Silica</b>		
ReproSil Chiral-OM, 3 µm / ReproSil Chiral-OM-R, 3 µm	Alternatives to Daicel OD-3 / OD-3R		
250 x 4.6 mm	150 x 4.6 mm	125 x 4.6 mm	
100 x 4.6 mm	50 x 4.6 mm	33 x 4.6 mm	
ReproSil Chiral-OM, 5 µm / ReproSil Chiral-OM-R, 5 µm	Alternative to Daicel OD-H / OD-RH		
250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm	
250 x 10 mm	250 x 20 mm		
ReproSil Chiral-OM, 10 µm / ReproSil Chiral-OM-R, 10 µm	Alternatives to Daicel OD / OD-R		
250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm	
250 x 10 mm	250 x 20 mm		
ReproSil Chiral-OM, 20 µm / ReproSil Chiral-OMR, 20 µm	Alternative to Daicel OD / OD-R		
250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm	
250 x 10 mm	250 x 20 mm		

<b>ReproSil Chiral-CM</b>	<b>USP-L70 (Tris-(Phenylcarbamate)-Cellulose mod. Silica)</b>		
ReproSil Chiral-CM, 3 µm	Alternative to Daicel OC-3	150 x 4.6 mm	(PN: r63.cm)
	250 x 4.6 mm		100 x 4.6 mm

ReproSil Chiral-CM, 5 µm	Alternative to Daicel OC-H	150 x 4.6 mm	(PN: r65.cm)
	250 x 4.6 mm		100 x 4.6 mm
	250 x 10 mm		

<b>ReproSil Chiral-JM</b>	<b>USP-L80 (Tris-(4-Methylbenzoyl)-Cellulose mod. Silica)</b>		
	Alternative to Daicel OJ-3 / OJ-3R		
ReproSil Chiral-JM, 3 µm (or ReproSil Chiral-JM-R)	250 x 4.6 mm	150 x 4.6 mm	(PN: r63.jm) 100 x 4.6 mm
	Alternative to Daicel OJ-H / OJ-HR		
ReproSil Chiral-JM, 5 µm (or ReproSil Chiral-JM-R)	250 x 4.6 mm	150 x 4.6 mm	(PN: r65.jm) 100 x 4.6 mm
	250 x 10 mm		
	Alternative to Daicel OJ / OJR		
ReproSil Chiral-JM, 10 µm (or ReproSil Chiral-JM-R)	250 x 4.6 mm	150 x 4.6 mm	(PN: r60.jm) 100 x 4.6 mm
	250 x 10 mm		

<b>ReproSil Chiral- ZM</b>	<b>Cellulose tris-3-Chloro-4-Methylphenylcarbamate mod. Silica</b>		
	Alternative to Daicel OZ-3 / OZ-3H		(PN: r63.zm)
ReproSil Chiral-ZM, 3 µm (or ReproSil Chiral-ZM-R)	250 x 4.6 mm	150 x 4.6 mm	125 x 4.6 mm
	100 x 4.6 mm	50 x 4.6 mm	33 x 4.6 mm

	Alternative to Daicel OZ-H		(PN: r65.zm)
ReproSil Chiral-ZM, 5 µm (or ReproSil Chiral-ZM-R)	250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm
	250 x 10 mm	250 x 20 mm	

<b>ReproSil Chiral-BM</b>	<b>Tris-(Benzoyl)-Cellulose mod. Silica</b>		
	Alternatives to Daicel OB-H / OB-RH		
ReproSil Chiral-BM, 5 µm / ReproSil Chiral-BM-R	250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm
	250 x 10 mm		
	Alternatives to Daicel OB / OB-R		
ReproSil Chiral-BM, 10 µm / ReproSil Chiral-BM-R	250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm
	250 x 10 mm		

**Coated Amylose Phases**

<b>ReproSil Chiral-AM</b>	<b>USP-L51, Amylose tris-3,5-dimethylphenylcarbamate mod. Silica</b>		
ReproSil Chiral-AM, 3 µm / ReproSil Chiral-AM-R, 3 µm	Alternative to Daicel AD-3 / AD-3R		
250 x 4.6 mm	150 x 4.6 mm	125 x 4.6 mm	
100 x 4.6 mm	50 x 4.6 mm	33 x 4.6 mm	
ReproSil Chiral-AM, 5 µm / ReproSil Chiral-AM-R, 5 µm	Alternatives to Daicel AD-H / AD-RH		
250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm	
250 x 10 mm	250 x 20 mm		
ReproSil Chiral-AM, 10 µm / ReproSil Chiral-AM-R, 10 µm	Alternatives to Daicel AD / AD-R		
250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm	
250 x 10 mm	250 x 20 mm		
ReproSil Chiral-AM, 20 µm / ReproSil Chiral-AM-R, 20 µm	Alternatives to Daicel AD / AD-R		
250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm	
250 x 10 mm	250 x 20 mm		

**ReproSil Chiral-AMS****Amylose tris-(S)- $\alpha$ -Methylbenzyl-Carbamate**ReproSil Chiral-AMS, 3  $\mu$ m / ReproSil Chiral-AMS-R, 3  $\mu$ m Alternatives to Daicel AS-3 / AS-3R

250 x 4.6 mm	150 x 4.6 mm	125 x 4.6 mm
100 x 4.6 mm	50 x 4.6 mm	33 x 4.6 mm

ReproSil Chiral-AMS, 5  $\mu$ m / ReproSil Chiral-AMS-R, 5  $\mu$ m Alternatives to Daicel AS-H / AS-RH

250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm
250 x 10 mm		

ReproSil Chiral-AMS, 10  $\mu$ m / ReproSil Chiral-AMS-R, 10  $\mu$ m Alternatives to Daicel AS / AS-R

250 x 4.6 mm	150 x 4.6 mm	100 x 4.6 mm
250 x 10 mm		

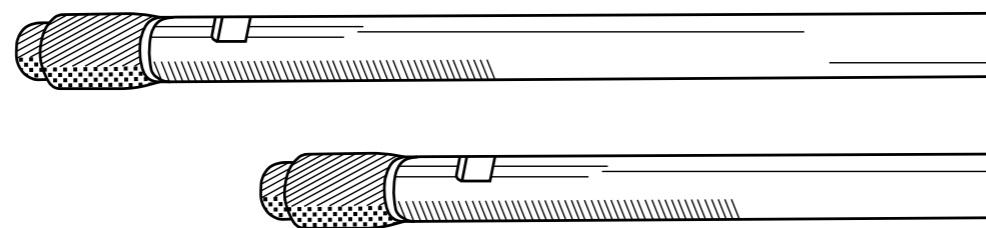
**ReproSil Chiral-ZA****Amylose tris-3-Chloro-4-Methylphenylcarbamate mod. Silica**

ReproSil Chiral-ZA, 3 $\mu$ m (or ReproSil Chiral-ZA-R)	Alternative to Daicel AZ-3 / AZ-3R (PN: r63.za)	
	250 x 4.6 mm	150 x 4.6 mm 125 x 4.6 mm
	100 x 4.6 mm	50 x 4.6 mm 33 x 4.6 mm

ReproSil Chiral-ZA, 5 $\mu$ m (or ReproSil Chiral-ZA-R)	Alternative to Daicel AZ-H / AZ-HR (PN: r65.za)	
	250 x 4.6 mm	150 x 4.6 mm 100 x 4.6 mm
	250 x 10 mm	250 x 20 mm

**ReproSil Chiral-YM****Amylose tris-5-Chloro-2-Methylphenylcarbamate mod. Silica**

ReproSil Chiral-YM, 3 $\mu$ m (or ReproSil Chiral-YM-R)	Alternatives to Daicel AY-3 / AY-3R (PN: r63.ym)	
	250 x 4.6 mm	150 x 4.6 mm 125 x 4.6 mm
	100 x 4.6 mm	50 x 4.6 mm 33 x 4.6 mm

**ReproSil Chiral-NR**

Immobilized brush-type phases, Dinitro-compounds.  
 $\pi$ -electron acceptor /  $\pi$ -electron donor phase. Particularly for aromatic compounds with O or N near chiral-centre. Chiral separations in NP and RP-Modus

5 $\mu$ m	(PN: r15.nr)	250 x 4.6 mm	
		150 x 4.6 mm	
		100 x 4.6 mm	
8 $\mu$ m	(PN: r18.nr)	250 x 4.6 mm	250 x 10 mm
12 $\mu$ m	(PN: r112.nr)	150 x 4.6 mm	250 x 20 mm
15 $\mu$ m	(PN: r115.nr)	100 x 4.6 mm	

**ReproSil Chiral-NR-R**

Reversed Elution order compared to ReproSil Chiral-NR /  
 Antipode of Chiral-NR

(PN: r18.nr)	250 x 4.6 mm	250 x 10 mm
	150 x 4.6 mm	
(PN: r112.nr)	100 x 4.6 mm	250 x 20 mm

**Other Chiral Phases****ReproSil Chiral-PS, 8  $\mu$ m**

Chiral separations in NP and RP-Modus

(for aromatic compounds with S or P, for example: Sulfoxides, Phosphine Oxides, Phosphonates, Thiophosphine Oxides, Phosphin Selenides, Phosphine Boranes)

250 x 4.0 mm	(PN: r18.ps)
--------------	--------------

**ReproSil Chiral-OH, 8  $\mu$ m**

Chiral separations in NP-Modus

(Aromatic Alcohols with OH near chiral centre, Aryl Carbinols)

250 x 4.0 mm	(PN: r18.oh)
--------------	--------------

**ReproSil Chiral-AA, 8  $\mu$ m**

(for all amino acids, L-form elutes first)

250 x 4.0 mm	(PN: r18.aa)
--------------	--------------

**ReproSil Chiral-TAG, 8  $\mu$ m**

Chiral separations in NP and RP-Modus

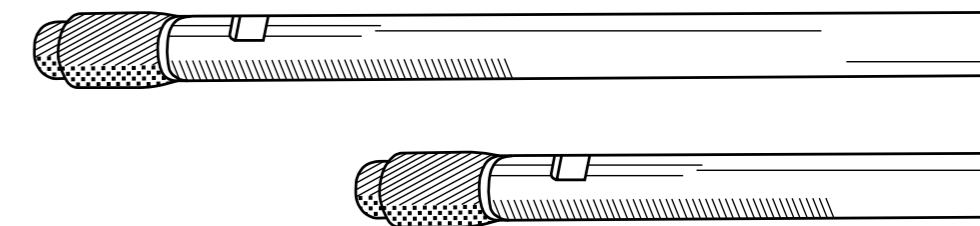
(Teicoplanin Aglycon: for Aminoalcohols, N-blocked amino acids,  $\alpha$ -Hydroxy Acids, Oxazolidinons, Hydantoin, Imides, Amino Acids) USP-L63

250 x 4.0 mm	(PN: r18.tag)
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**ReproSil Chiral-Beta-CD, 5  $\mu$ m**

USP-L45 (Dansyl-Aminoacids, Barbiturates, Propranolol Sulfonamide, Prostaglandines)

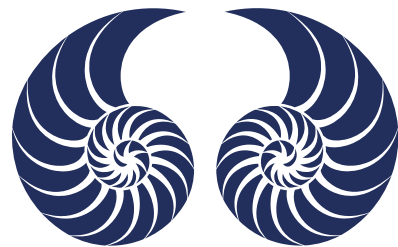
<b>ReproSil Chiral-Gamma-CD, 5 µm</b>	250 x 4.0 mm (PN: r15.gcd.s2504)		
<b>ReproSil Chiral-D-PhenylGlycin, 5 µm</b>	USP-L36, N-(3,5-Dinitrobenzoyl)-D-Phenylglycin. (Herbicides + Pharmaca (Alcohols, Carbon. acids, Esters, Sulfoxides) Fenoprop-Methyl, Mecoprop-Methyl, Supidimid) 250 x 4.0 mm (PN: r15.DPG.s2504) 250 x 10 mm 250 x 20 mm		
<b>ReproSil Chiral-L-PhenylGlycin, 5 µm</b>	USP-L36 N-(3,5-Dinitrobenzoyl)-L-Phenylglycin. Antipode to D-PhenylGlycin (Herbicides + Pharmaca (Alcohols, Carbon. Acids, Esters, Sulfoxides) Fenoprop-Methyl, Mecoprop-Methyl, Supidimid) 250 x 4.0 mm (PN: r15.LPG.s2504)		
<b>ReproSil Chiral-L-Leucin, 5 µm</b>	N-(3,5-Dinitrobenzoyl)-L-Leucin 250 x 4.0 mm (PN: r15.LL.s2546)		
<b>ReproSil Chiral-L-Prolin, 5 µm</b>	Davankov-Ligand exchange, Aminoacids, Hydantoine, Succinimide, Gluthetimide, Barbiturate, Sulfoxide 250 x 4.0 mm (PN: r15.pr.s2504)		
<b>ReproSil L-Hydroxy-Prolin, 5 µm</b>	Alternative to Nucleosil Chiral-1, USP-L32 Ligand exchange, Eluent: 2-10 mM Coppersulfate, 20-60 C° (For DL-Atrolactinacid, DL-Mandelic acids, DL-Lactic acid, DL-Asparagin, DL-Serin, DL-Phenylalanin, DL-Threonin, DL-Prolin, DL-Histidin, DL-Valin, DL-Tyrosin, DL-Tryptophan), 250 x 4.0 mm (PN: r15.hp.s2504)		
<b>ReproSil Chiral-AGP, 5 µm</b>	300 A° Silicagel with chiral AGP-Protein, USP-L41		
100 x 4.0 mm	(PN: r35.agp.s1004)	150 x 2.0 mm	(PN: r35.agp.s1502)
150 x 3.0 mm	(PN: r35.agp.s1503)	100 x 2.0 mm	(PN: r35.agp.s1002)
100 x 3.0 mm	(PN: r35.agp.s1003)	50 x 2.0 mm	(PN: r35.agp.s0502)
50 x 3.0 mm	(PN: r35.agp.s0503)		
Guards: 5 x 3.0 mm: 2 pieces	(PN: r35.agp.v0003)	Guards: 5 x 2.0 mm: 2 pieces	(PN: r35.agp.v0002)
Guard-holder, direct	(PN: 81.00)	Guard-holder, direct	(PN: 91.00)



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