Kromasil Chiral – the technical evidence

Kromasil®

The way to peak performance in liquid chromatography

AkzoNobel

“We care about your chiral separations”

The silica

Kromasil chiral stationary phases for HPLC, SFC and SMB are based on the well-known Kromasil premium spherical silica. The surface properties of the silica have a great impact on the selectivity of the chiral phases.

The chiral polymer

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

Kromasil Chiral DMB: The chiral monomer is 0,0'-bis (3,5-dimethylbenzoyl)-N,N'-diallyl-L-tartar diamide.

Kromasil Chiral TBB: The chiral monomer is 0,0'-bis (4-tert-butylbenzoyl)-N,N'-diallyl-L-tartar diamide.

The chiral monomers are reacted with a multifunctional hydrosilane yielding a network polymer incorporating the bifunctional C2-symmetric chiral selector (figure 1).

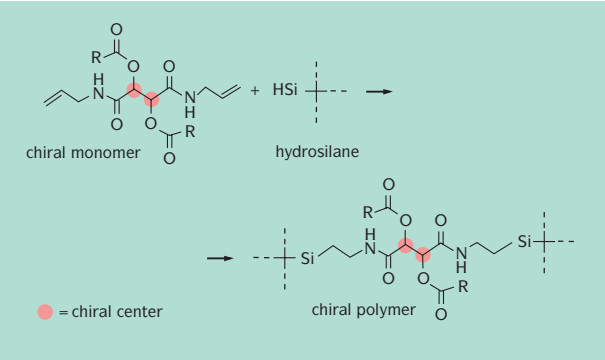

Figure 1 | Chiral polymer synthesis.

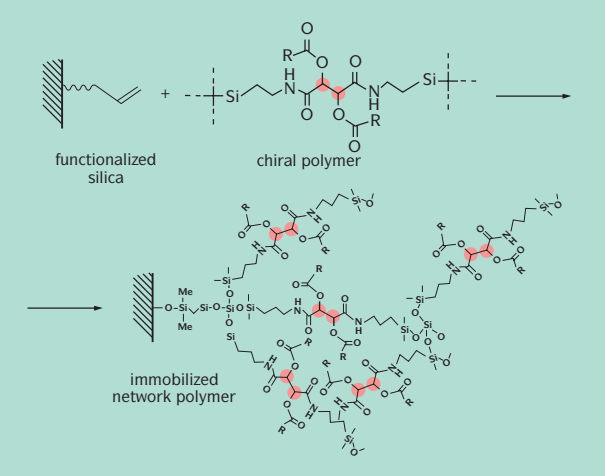

Figure 2 | The binding of the chiral polymer to the Kromasil silica.

The chiral stationary phases

The chiral polymer is covalently bonded to functionalized Kromasil silica, as seen in figure 2.

CHIRAL NETWORK POLYMERS COVALENTLY BONDED TO KROMASIL SILICA TO BE USED WITH *ALL* SOLVENTS IN HPLC, SFC AND SMB/MCC.

Properties of Kromasil Chiral

Performance

Kromasil Chiral separate a broad range of racemates (see separate application brochure). The phases are based on 5 µm, 10 µm or 16 µm particles for best efficiency. The small particles are necessary for difficult separations and give sharp peaks in analytical separations.

For preparative scale, 10 µm or 16 µm particles are ideal, giving high efficiency and relatively low pressure drop in large diameter columns. The best selectivity is obtained under normal phase conditions. The phases are however stable also under reversed phase conditions.

Mechanical and chemical stability

In large diameter columns, the mechanical stability of the stationary phase is of great importance.

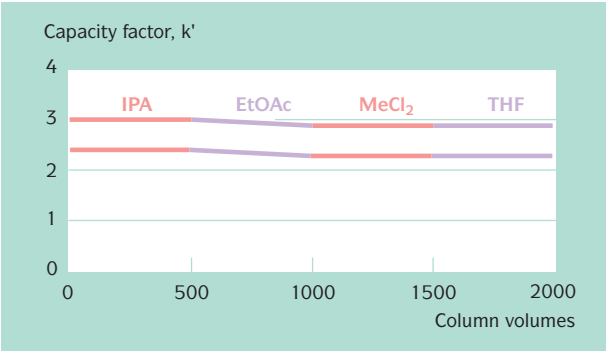

Figure 3 | Kromasil Chiral with different purging solvents.

Conditions: Test probe: R,S-binaphtol. Silica: Kromasil Chiral DMB. Eluent: hexane:IPA (95:5). Column: 4.6 × 250 mm. Flow rate: 2 ml/min.

Kromasil silica is among the most mechanically stable HPLC silicas.

The high chemical stability is given by the nature of the network polymer covalently bonded to the silica. Kromasil Chiral can be used with most solvents and buffers in the mobile phase without degradation, see figure 3. TFA buffers can under certain conditions cause some hydrolysis of the phases.

Kromasil Chiral have already been used in DAC columns for more than 20,000 preparative injections without any deterioration.

Loadability

The high loading capacity of Kromasil Chiral is given by the high available surface area of the Kromasil silica and the high chiral ligand density. The loading capacity in preparative scale is of course determined also by the separation factor, a. Two preparative applications are illustrated in figures 4 and 5.

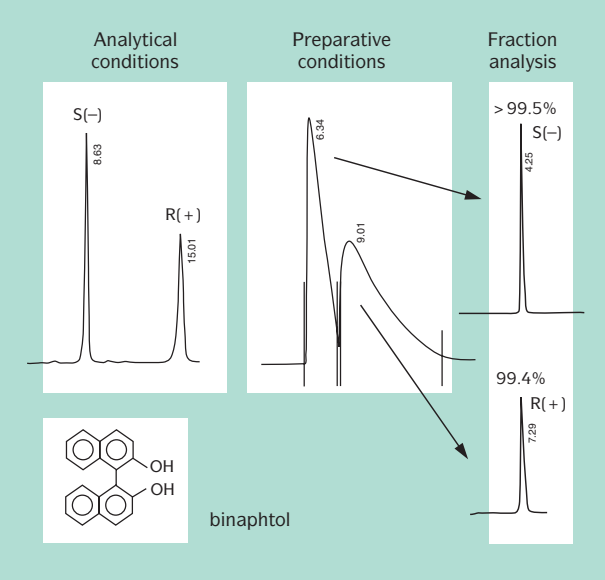

Figure 4 | Analytical and preparative separation of R,S-binaphtol.

Conditions, analytical:
Kromasil Chiral DMB, 5 µm. Column: 4.6 × 250 mm. Flow rate: 1.0 ml/min.
Mobile phase: Hexane:MTBE (7:3)
Conditions, preparative:
Kromasil Chiral DMB, 10 µm. Column: 50 × 250 mm, DAC. Flow rate: 118 ml/min.
Mobile phase: Hexane:MTBE (7:3). Load: 1,770 mg.

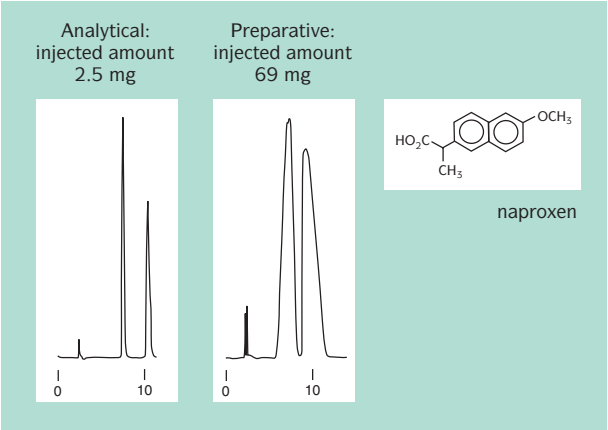

Figure 5 | Analytical and preparative separation of (+,–)-naproxen.

Conditions:
Kromasil Chiral TBB. Column: 10 × 250 mm. Flow rate: 4.7 ml/min.
Eluent: Hexane:acetone (92:8) + 1.0% acetic acid. α = 1.65

Availability

(both Kromasil Chiral DMB and TBB)

Bulk

5 µm, 10 µm and 16 µm

Columns

Analytical column 4,6 × 250 mm:
5 µm and 10 µm
Preparative column 10 × 250 and 21,2 × 250 mm:
5 µm and 10 µm
Upon request, column 50 (2") × 250 mm:
10 µm

Test kit

Two columns (DMB and TBB) 4,6 × 50 mm:
5 µm

Kromasil chiral stationary phases are patented by Eka Chemicals AB and manufactured according to ISO 9001.

The moment you adopt our Kromasil High Performance Concept, you join thousands of chromatographers who share a common goal: to achieve better separations when analyzing or isolating pharmaceuticals or other substances.

Not only will you benefit from our patented silica technology, but you gain a strong partner with a reliable track record in the field of silica products. For the past 60 years, Eka Chemicals has pioneered new types of silica. Our long experience in the field of silica chemistry is the secret behind the development of Kromasil, and the success of our Separation Products Group.

Kromasil is available in bulk, or in high-pressure slurry-packed columns. The development, production and marketing of Kromasil are ISO 9001 certified.

Eka Chemicals is a global company with 2,900 people in 30 countries. It is a business unit within Akzo Nobel, one of the world's largest chemical groups, with more than 62,000 employees in 80 countries.

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