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Extending the Range of Solvents for Chiral Analysis Using a New Immobilized Polysaccharide Chiral Stationary Phase, CHIRALPAK® IA

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A new analytical chiral column, CHIRALPAK® IA, based upon a new immobilized polysaccharide chiral stationary phase, allows the use of many different organic solvents as mobile phase, mobile phase modifiers, and sample solvents.

Polysaccharide-based chiral stationary phases (CSP) are the media of choice for analytical and preparative chiral separations due to their unparalleled application range and versatility. Until now, the only limitation of these columns has been a restricted range of solvents that can be used due to issues of solubility of the polymer coating. CHIRALPAK IA is the first in a new series of columns that has been prepared using a novel immobilization technology that results in a completely solvent-stable CSP. These columns retain the high selectivity and versatility of the existing range of DAICEL columns.

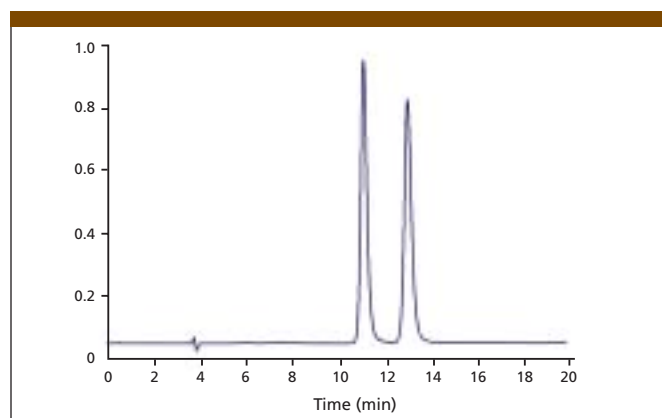


Figure 1: Separation of suprofen enantiomers using CHIRALPAK IA (25 cm × 4.6 mm) with hexane: ethyl acetate: TFA (70:30:0.1) at 1 mL/min, T = 25 °C.

The major benefit of the enhanced solvent stability is that any organic solvent can now be used as a mobile phase or mobile phase component to increase the selectivity or the range of application of the columns beyond that found with conventional alkane-alcohol mixtures. This also allows the use of different solvents, such as chloroform or DMSO, in the sample to enhance solubility, and prevents column problems when a small amount of the “wrong” solvent is introduced by mistake.

Three separations are shown here to illustrate the use and stability of CHIRALPAK IA with “unconventional” solvents. Figure 1 shows the separation of the enantiomers of suprofen in hexane/ethyl acetate/TFA

(70:30:0.1). Figure 2 shows the resolution of bupivacaine using methyl-*tert*-butyl ether/ethanol/DEA (95:5:0.1) as mobile phase. Finally, the use of hexane/dichloromethane/2-propanol/TFA (35:65:1:0.1) for the separation of 3-oxo-1-indancarboxylic acid enantiomers is shown in Figure 3.

Rapid chiral separations with longer column lifetime and new selectivity and capabilities are now possible with this first immobilized polysaccharide-based column, CHIRALPAK IA.

(CHIRALPAK is a registered trademark of Daicel Chemical Industries Ltd.)

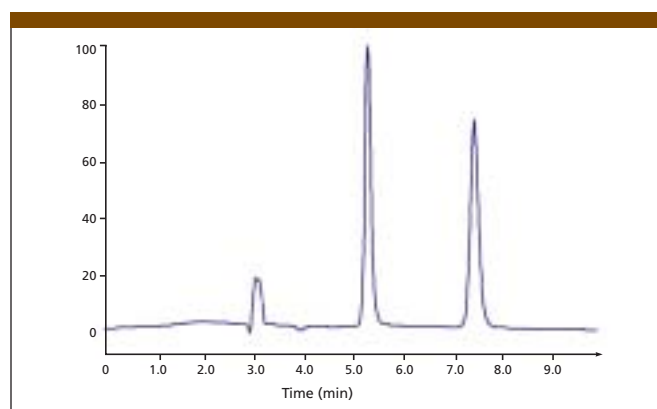


Figure 2: Separation of bupivacaine enantiomers using CHIRALPAK IA (25 cm × 4.6 mm) with methyl-*tert*-butyl ether: ethanol: DEA (95:5:0.1) at 1 mL/min, T = 25 °C.

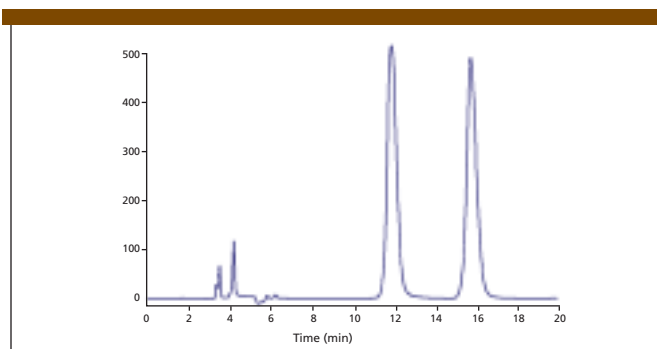


Figure 3: Separation of 3-oxo-1-indancarboxylic acid enantiomers using CHIRALPAK IA (25 cm × 4.6 mm) with hexane: dichloromethane:2-propanol: TFA (35:65:1:0.1) at 1 mL/min, T = 25 °C.

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