INTRODUCING
THE FIRST sub-2 MICRON CHIRAL COLUMNS FROM DAICEL

APPLICATION NOTE

INTRODUCTION

Daicel Corporation has begun its launch of sub-2 µm chiral columns, CHIRALPAK® IA-U and CHIRALPAK IC-U, adding to its well-known family of immobilized chiral stationary phases (CSPs). CHIRALPAK IA-U and IC-U columns are designed to be used on UHPLC systems, for ultrafast and high-resolution separations of enantiomers, marking a first in the industry.

ULTRAFAST SEPARATIONS

As shown in Figure 1, the CHIRALPAK IA-U column effects the same separation as a CHIRALPAK IA-3 column, but in less than half the time (30 seconds versus 72 seconds). Ultrafast separations of chiral compounds are of utmost importance for rapid, high-throughput screening and method development phases, allowing a significant decrease in method development and analysis time, which leads to cost savings.

HIGHER RESOLUTION POWER

CHIRALPAK IA-U's higher resolution power affords a much higher resolution than the standard 3-µm column, as shown in Figure 2. In this example, a 3.0 mm x 50 mm CHIRALPAK IA-U provides almost baseline separation of 2,2,2-trifluoro-1-(9-anthryl) ethanol (TFAE), while a CHIRALPAK IA-3 column of the same length is not adequate to show any separation.

EASE OF METHOD TRANSFER

Figure 3 shows retention factor (k) data plotted for the separation of 10 compounds, using CHIRALPAK IC-3 and sub-2 µm IC-U columns. The excellent correlation coefficient (R) confirms that the (k) data for all 10 compounds are extremely well aligned. It follows that if a set of compounds has been separated on 3-µm columns, no new method development is required to switch to sub-2 µm columns.

EXPERIMENTAL AND DISCUSSION

CHIRALPAK IA and IC (3 µm) columns and CHIRALPAK IA-U and IC-U (< 2 µm) columns were used to obtain the data shown in Figures 1, 2 and 3.

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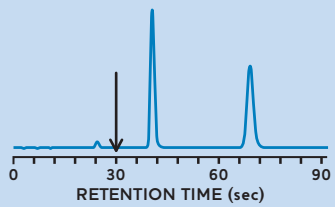
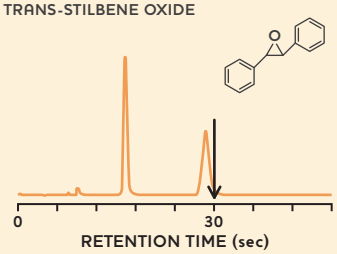
FIGURE 1: ULTRAFAST SEPARATIONS

3-µm COLUMN



sub-2 µm COLUMN

TRANS-STILBENE OXIDE



CHROMATOGRAPHIC CONDITIONS

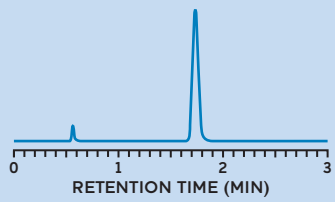
Column: CHIRALPAK IA-3
Column Size: 3.0 mm i.d. x 50 mm long
Mobile Phase: n-Hex/IPA 90/10 v/v
Flow rate: 0.6 mL/min.
Temperature: 25° C
UV: 230 nm

CHROMATOGRAPHIC CONDITIONS

Column: CHIRALPAK IA-U
Column Size: 3.0 mm i.d. x 50 mm long
Mobile Phase: n-Hex/IPA 90/10 v/v
Flow rate: 1.5 mL/min.
Temperature: 25° C
UV: 230 nm

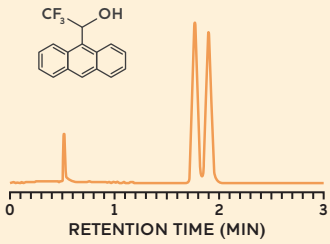
FIGURE 2: HIGHER RESOLUTION POWER

3-µm COLUMN



sub-2 µm COLUMN

2,2,2-TRIFLUORO-1-(9-ANTHRYL)ETHANOL



CHROMATOGRAPHIC CONDITIONS

Column: CHIRALPAK IA-3
Column Size: 4.6 mm i.d. x 50 mm long
Mobile Phase: n-Hex/IPA 90/10 v/v
Flow rate: 1.0 mL/min.
Temperature: 25° C
UV: 230 nm

CHROMATOGRAPHIC CONDITIONS

Column: CHIRALPAK IA-U
Column Size: 3.0 mm i.d. x 50 mm long
Mobile Phase: n-Hex/IPA 90/10 v/v
Flow rate: 0.425 mL/min.
Temperature: 25° C
UV: 230 nm

FIGURE 3: EASE OF METHOD TRANSFER