L-column ODS (3μm)

L-column ODS(3μm) is also produced using a preeminent deactivation processing technology just like L-column ODS(5μm). The preeminent deactivation is performed by high-temperature gaseous-phase silylation (Super endcapping patent No.5,134,110 U.S.A., No.2611545 JAPAN). It deactivates the residual silanol on the silica gel surface nearly completely.

Theoretical plate number with L-column ODS(3μm) can be obtained at 1.5 times (150,000 plates/meter) the rate with which they are obtained with the L-column ODS(5μm), which is the highest that has been obtained so far for commercial columns. L-column ODS(3μm) is suitable for high-throughput analysis because it's optimal flow rate is twice higher than that of 5μm column.
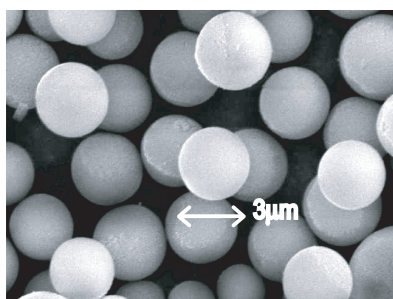
Specifications of Silica particles
Average particle size: 3μm
Average pore size: 12nm
Surface area: $340m^2/g$
Pore volume: 1.1mL/g
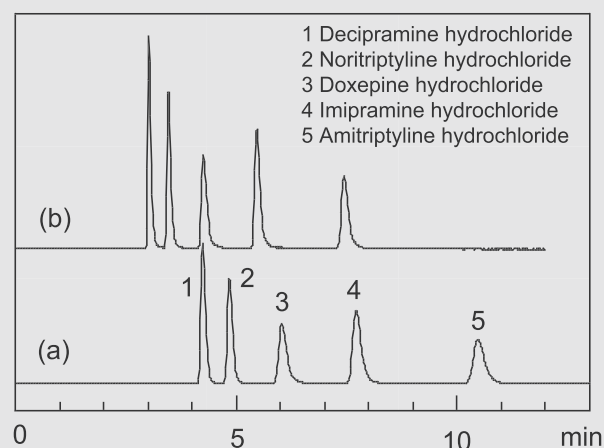Carbon content: 17%

■ Anti-depressants' analysis

Anti-depressants are basic compounds. In HPLC analysis, they cause tailing of the peak. We attempted simultaneous analysis of typical anti-depressants with the L-column ODS(3μm).

There was no tailing of the peak, and adsorption occurred without an ion-pair reagent.

Since L-column ODS(3μm) yields theoretical plate number at 1.5 times the rate at which they are obtained with L-column ODS(5μm), the analysis time is shortened and a column length of two-thirds yields same separation efficiency.

Therefore it can be said that this is the most suitable column for highly sensitive separation of basic compounds and high-speed analysis.
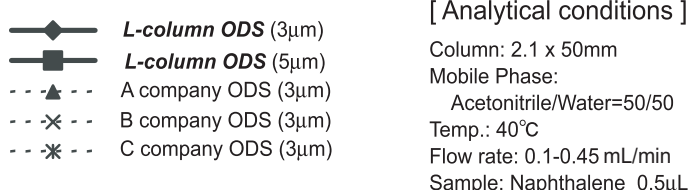
1 Decipramine hydrochloride
2 Noritriptyline hydrochloride
3 Doxepine hydrochloride
4 Imipramine hydrochloride
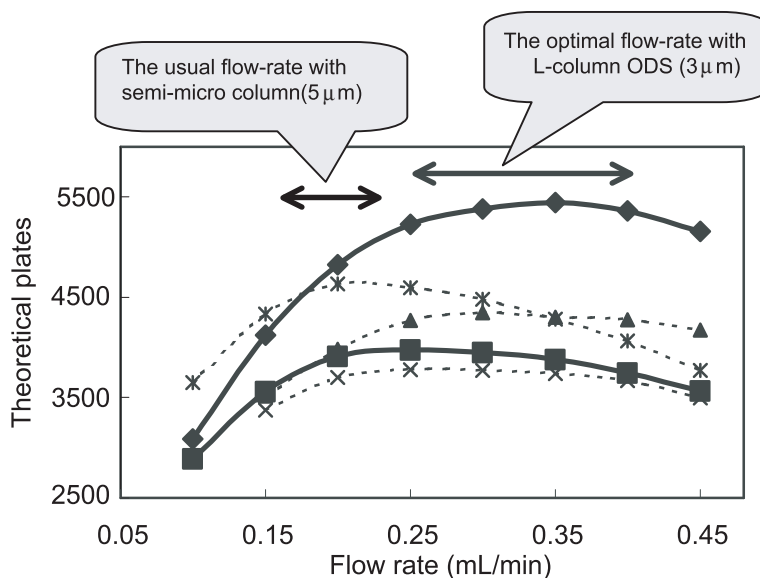5 Amitriptyline hydrochloride

[Analytical conditions]

Column : a) L-column ODS (5μm) 4.6 x 150mm
b) L-column ODS (3μm) 4.6 x 100mm
Mobile Phase : Methanol/50mM CH_3COONH_4=66/34
Flow-Rate : 1mL/min
Temp. : 30℃
Detection : UV 254 nm

■ Relationship between theoretical plates and the flow-rate

The optimal flow-rate of a 2.1mm i.d. semi-micro column packed 5μm ODS is 0.2mL/min. Since L-column ODS (3μm) can yield a maximum theoretical plate number rate of 0.25 – 0.4 mL/min, it is probably the best column most suitable for shortening of time and high-throughput analysis. Furthermore, it is also effective for LC/MS analysis using a short column (50 mm and 100mm) , because its theoretical plate number is better than those of columns produced by other companies.

The usual flow-rate with semi-micro column(5μm)

The optimal flow-rate with L-column ODS (3μm)

- ◆ **L-column ODS** (3μm)
- ■ **L-column ODS** (5μm)
- ▲ A company ODS (3μm)
- ✕ B company ODS (3μm)
- ✳ C company ODS (3μm)

[Analytical conditions]

Column: 2.1 x 50mm
Mobile Phase:
    Acetonitrile/Water=50/50
Temp.: 40℃
Flow rate: 0.1-0.45 mL/min
Sample: Naphthalene 0.5μL

■ High-speed analysis of "cold" medicines

We analyzed six ingredients in a commercially available "cold" medicine. When a 4.6x150mm L-column ODS (5μm) was changed to a 4.6x50mm L-column ODS (3μm), the six ingredients were separated completely in less than 2 minutes when the flow-rate was set at 2mL/min.

[Analytical conditions]

Column : a) L-column ODS (5μm) 4.6 x 150mm
          b) L-column ODS (3μm) 4.6 x 50mm
Mobile Phase : Methanol/20mM H_3PO_4 = 40/60
Flow-Rate : a) 1mL/min
          : b) 2mL/min
Temp. : 40℃
Detection : UV 254 nm

1. Acetaminophen
2. Caffeine
3. Narcotine
4. Chlorpheniramine Maleate
5. Ethenzamide
6. Bucetin

Shortening of analysis time to 1/6