

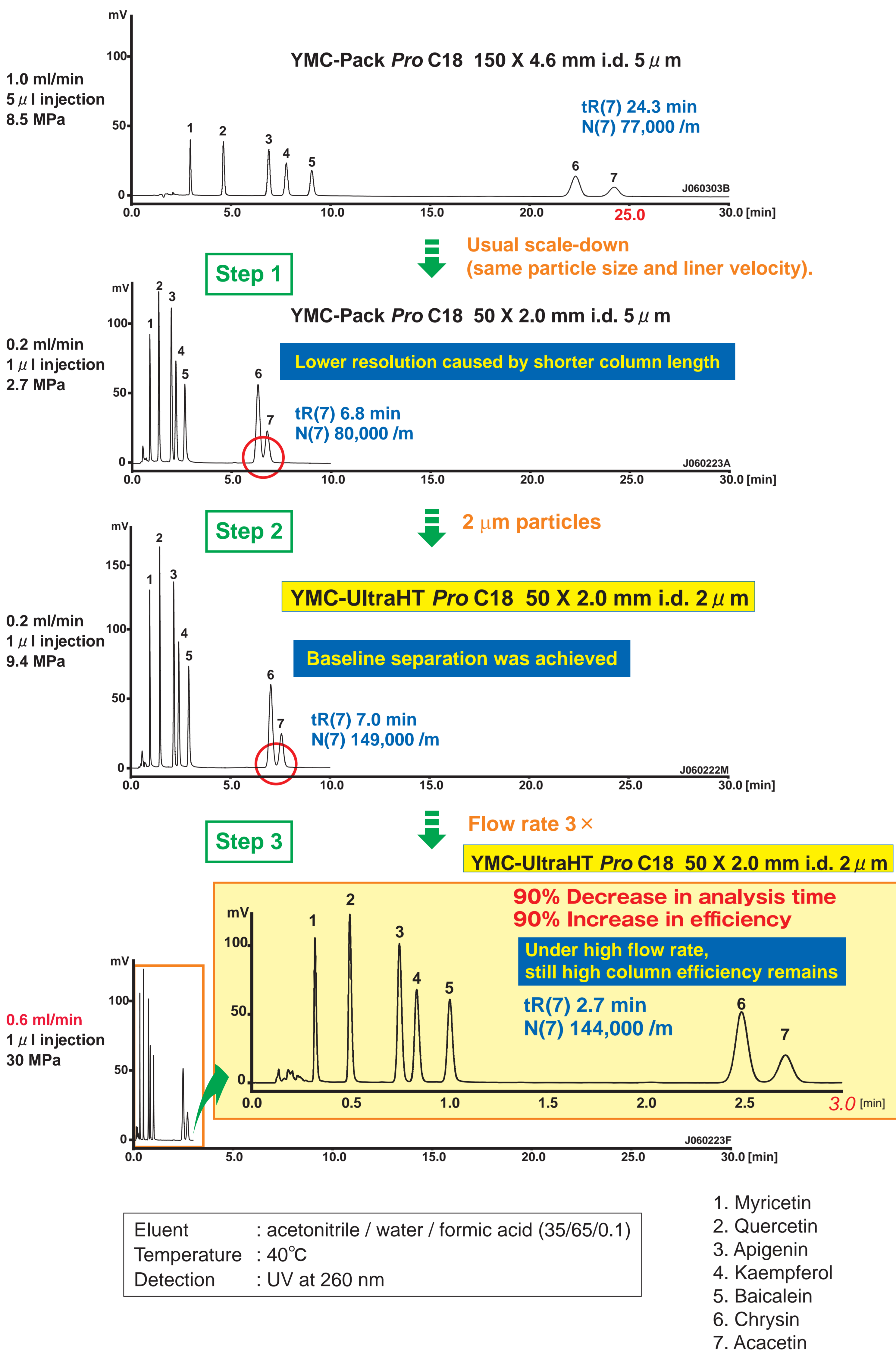
1. Introduction

Ultra-fast HPLC analysis has been applied in specific fields recently because it improves system durability under high pressure. To obtain high resolution, it would be necessary to use smaller particles such as 2 μ m or sub-2 μ m.

We developed 2 μ m packing materials with narrow distribution. They are specially designed for ultra-fast LC. Our 2 μ m column can be available not only at lower pressure but also with easily handling. It shows the same separation pattern as 3 μ m and 5 μ m YMC-Pack Pro C18. For that reason, it is easy to scale it down to ultra-fast conditions without changing eluent conditions used in conventional columns. We will show some examples of separation data comparing our commercially available materials and competitors.

2. Experiments

Flavonoids



These chromatograms show method transfer from conventional LC to ultra-fast LC with YMC-UltraHT Pro C18.

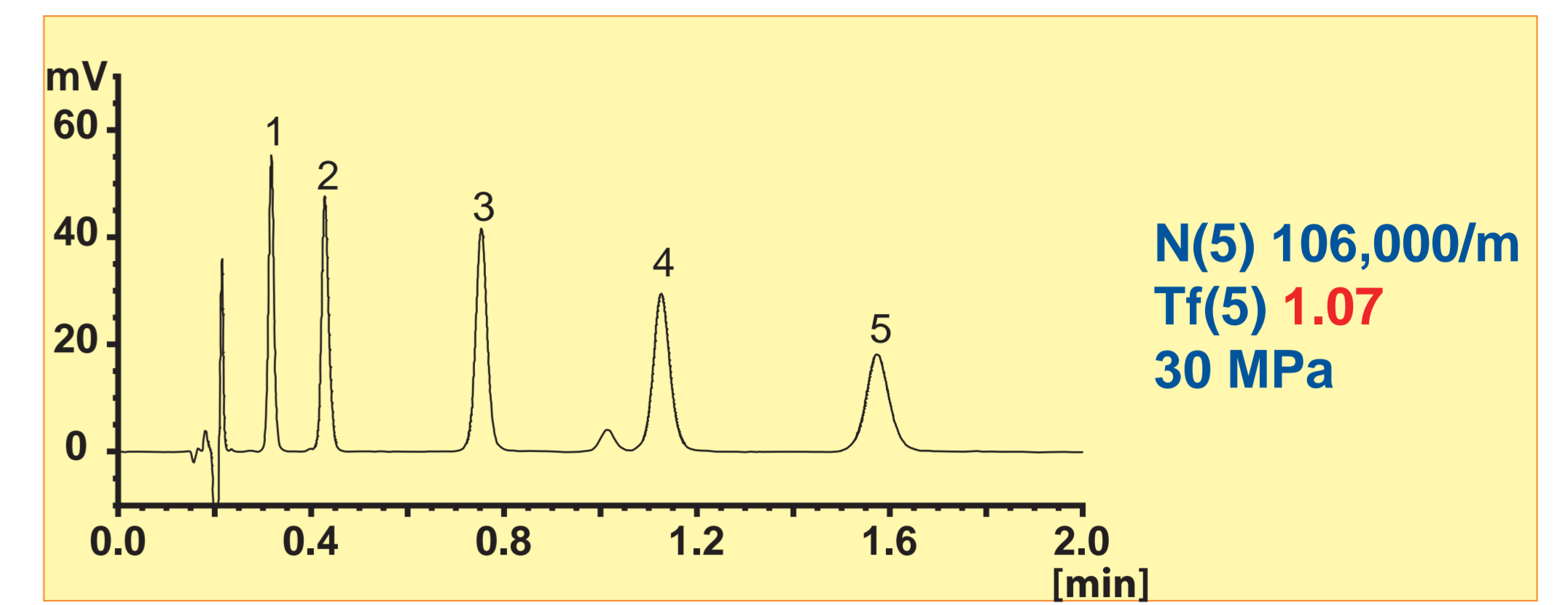
Step 1 - Scaling down to 50 x 2.0 mm i.d. (5 μ m particles) made shorter analysis time but resolution of peak 6 and 7 were worse than conventional method caused by short length.

Step 2 - By using 2 μ m YMC-UltraHT Pro C18, higher theoretical plate number was obtained. The resolution of peak 6 and 7 were improved and baseline separation was achieved.

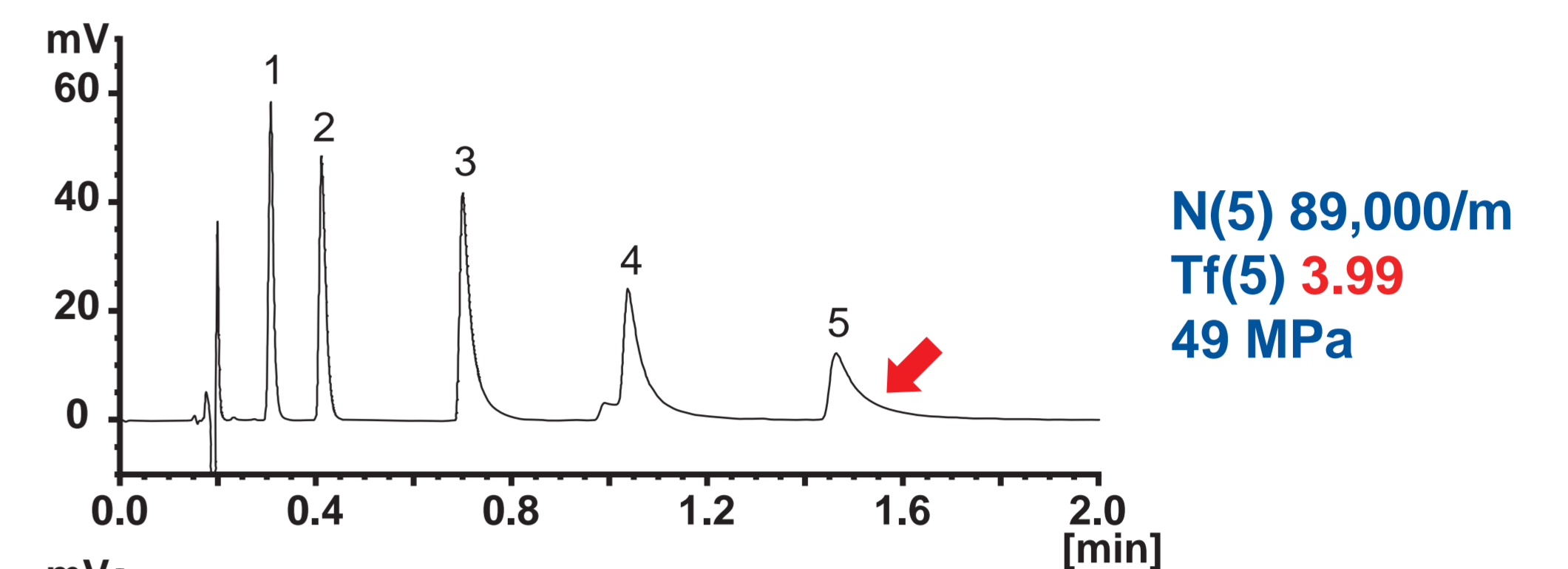
Step 3 - The column designed for ultra-fast LC shows high efficiency under high flow rate. Therefore, by changing flow rate three times faster than the steps 1 and 2, minimizing analysis time was achieved.

Alkaloids

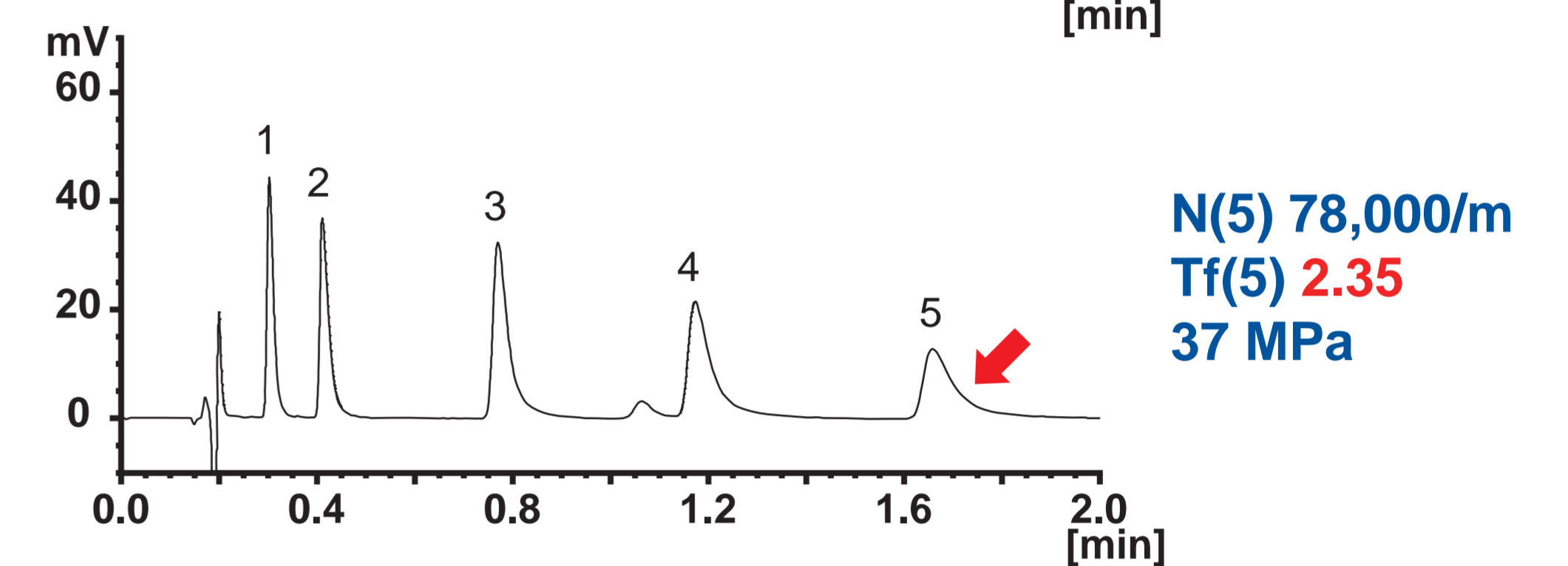
YMC-UltraHT Pro C18
2 μ m
50 x 2.0 mm i.d.



Brand I7
sub-2 μ m
50 x 2.1 mm i.d.



Brand L4
sub-2 μ m
50 x 2.1 mm i.d.



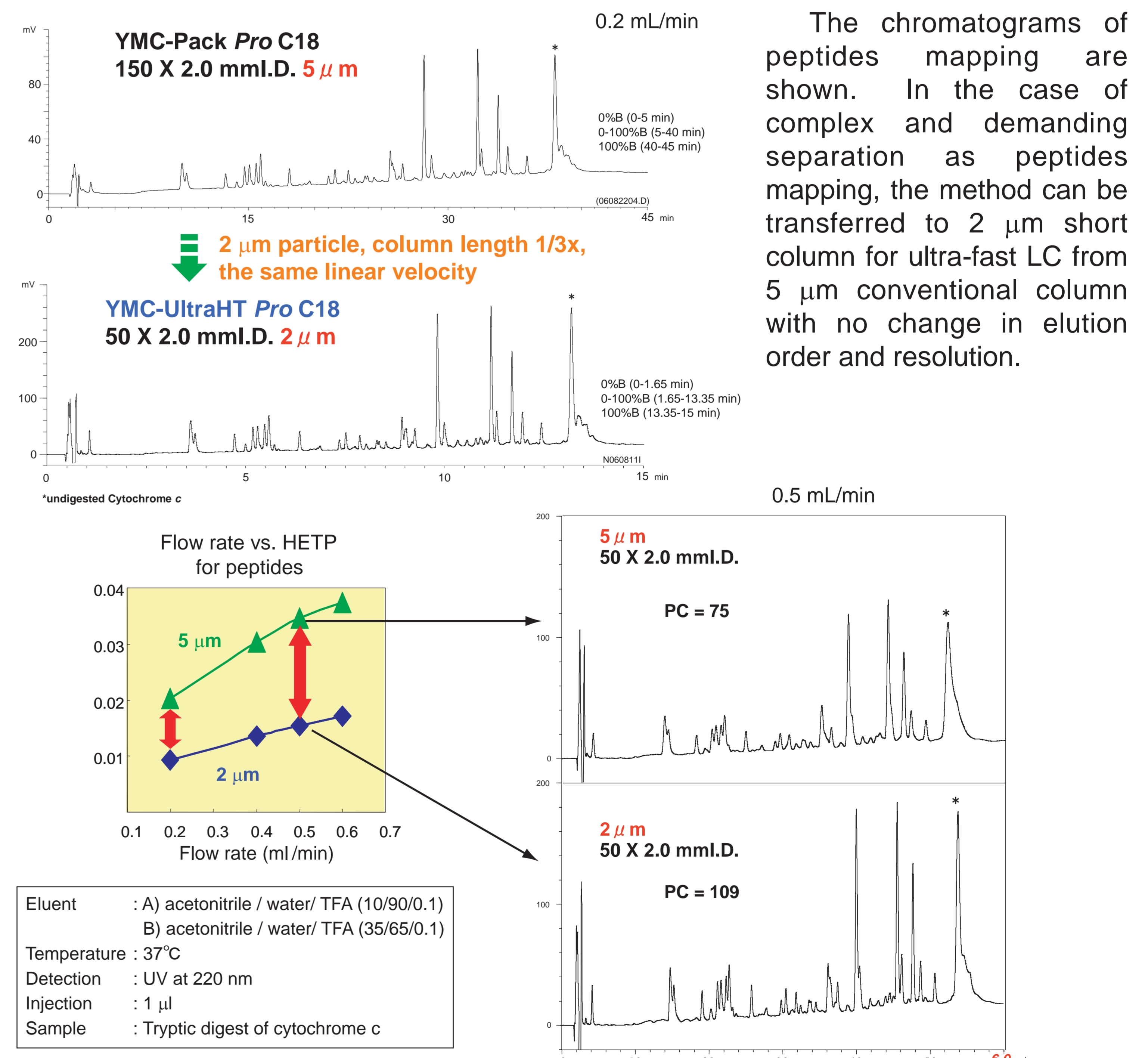
Eluent : 20mM CH₃COOH-CH₃COONH₄ (pH 4.9) /acetonitrile (80/20)
Flow rate : 0.6 ml/min
Temperature : 40°C
Detection : UV at 220 nm
Injection : 1 μ l

1. Scopolamine
2. Atropine
3. Cinchonine
4. Quinine
5. Dihydroquinine

These chromatograms are ultra-fast analyses of alkaloids by using 2 μ m YMC-UltraHT and sub 2 μ m competitors'.

Analysis with Brand I7 and L4 shows peak tailing and higher pressure. However, YMC-UltraHT gives high efficiency and good peak shape. It is suggested that our UltraHT is useful column for analyzing basic compounds.

Peptides mapping



The chromatograms of peptides mapping are shown. In the case of complex and demanding separation as peptides mapping, the method can be transferred to 2 μ m short column for ultra-fast LC from 5 μ m conventional column with no change in elution order and resolution.

To reduce analysis time, higher flow rate was attempted. In case of 0.5 ml/min, high peak capacity was maintained with 2 μ m column.

3. Conclusions

- In ultra-fast LC analysis, YMC-UltraHT Pro C18 is useful column for various compounds. (i.e. natural product derivatives, basic compounds etc.)
- Simple method transfer is available from conventional LC of YMC's standard C18 columns.
- Our 2 μ m column is applicable for high throughput analysis such as pharmaceuticals, biomolecules, agricultural chemicals and foods.