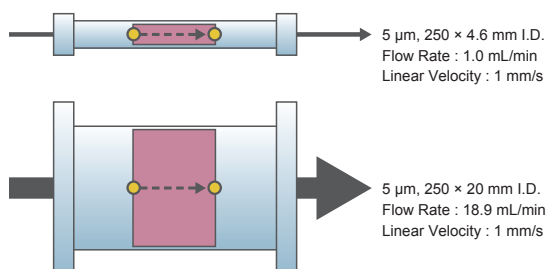


Choosing Preparative Columns

Relationship between Column I.D. , Sample Loading Volume and Flow Rate

In preparative operations, column internal diameter sizes from 6.0 to 100 mm are widely used. When the analytical conditions along with the column packing material and length were the same between the analytical and preparative run, nearly the same chromatograms can be achieved by simply adjusting the flow rate and sample loading volume in proportion to the column cross-section area. The following table illustrates the appropriate flow rate against each column internal diameter sizes.



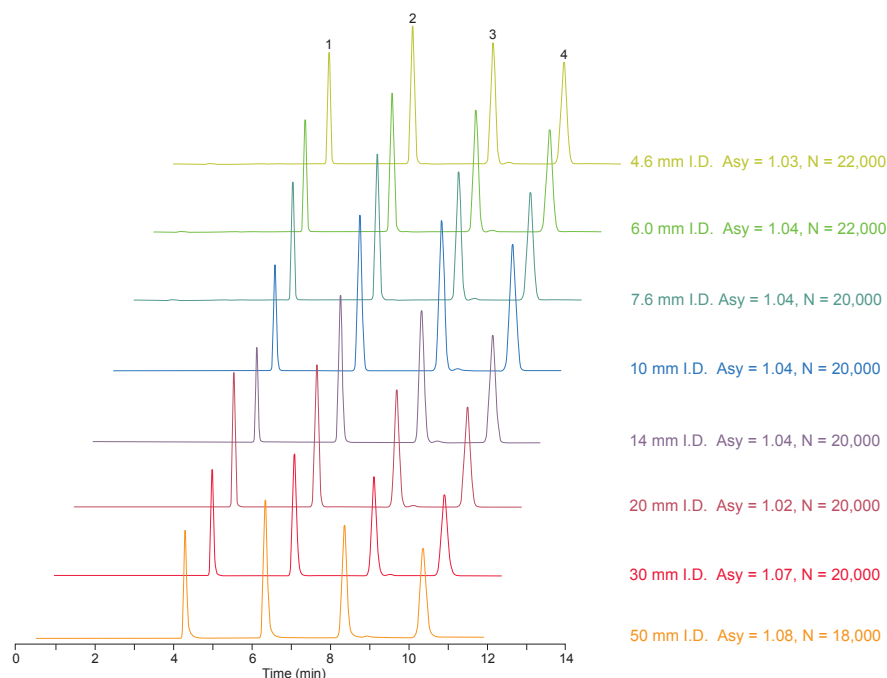
Column I.D. (mm)	Scale-Up Factor	Appropriate Flow Rate (mL/min) ^{*1}				Remarks
		Reversed/Normal Phases	SEC	HILIC	Chiral	
4.6	1	1	0.2 - 0.3	0.5	1	Determine and optimize the analytical separation using 4.6 mm I.D. analytical columns.
6.0	1.7	1.7	0.3 - 0.5	0.8	1.7	Semi-preparative HPLC columns can be used in standard HPLC systems. Column I.D. sizes from 7.6-8.0 mm are generally used when scaling-up in SEC.
7.6 - 8.0	2.7	2.7	0.5 - 1.0	1.4	2.7	
10	5	5	1.0 - 1.5	2.4	5	
14	9	9	1.8 - 2.5	4.6	-	
20	19	19	3.8 - 5.4	9.5	19	Column I.D. sizes dominantly used in preparative HPLC researches. Dedicated preparative HPLC systems are required as a wide flow rate range is required.
30	43	43	9.0 - 14	21	45	
50	120	120	24 - 36	60	50 ^{*3}	
100	470	235 ^{*2}	47 - 71 ^{*2}	120 ^{*2}	200 ^{*3}	

* 1 : When the particle size of the packing material is a 5 μ m.
* 2 : When the particle size of the packing material is a 10 μ m.
* 3 : When the particle size of the packing material is a 20 μ m.

Smooth and Easy Scale-Up from Analytical to Preparative Dimensions

Generally, analytical scale columns are used initially to determine and optimize separation conditions between the target peak and unwanted contaminants with various bonded phases. Efficient scale-up of methods from analytical to preparative dimensions requires the use of a packing material offering identical selectivity, otherwise methods would not scale as expected.

InertSustain and Inertsil preparative HPLC columns offer asymmetry factor of nearly 1.0 delivering symmetric peaks maintaining efficiency of approximately 20,000 (N) when the column length is a 250 mm. As shown below, the scalability of InertSustain and Inertsil preparative HPLC columns provides smooth, easy and highly efficient purification and isolation results.



Conditions

System : PLC 761 System
Column : Inertsil ODS-3 (5 μ m, 250 mm)
Eluent : A) CH₃CN
 B) H₂O
 A/B = 65/35, v/v
Flow Rate : Linear Velocity at 1 mm/s
Col. Temp. : 40 °C
Col. Pres. : Approx. 5.0 MPa (50 bar)
Detection : UV 254 nm
Sample : 1. Acetophenone
 2. Benzene
 3. Toluene
 4. Naphthalene

