

For High Performance Liquid Chromatography

COSMOSIL[®] PACKED COLUMN

1. INTRODUCTION

Thank you for purchasing our COSMOSIL Packed Column. The products are made of stainless steel and packed with totally porous spherical silica-based materials. Please read this manual carefully to ensure maximum separation efficiency and long lifetime of the columns.

2. CARE AND USE

1. Avoid mechanical shocks to the column.
2. Connect the column according to the flow direction indicated on the label.
3. Keep pressure under 20 MPa (under 15 MPa for 10 mm I.D. or wider columns). Take special care when using highly viscous mobile phase.
4. Elute the column with 20 - 30 mL mobile phase before connecting to the detector.
5. Use scrupulously degassed mobile phase. Air bubbles generate detection noise and accelerate column deterioration.
6. Use only HPLC grade solvents.
7. Avoid precipitation in the column. Check the solvent constitution on the enclosed inspection record.
8. Keep the pH of the mobile phase within the range of 2 to 7.5. Buffer concentration is usually sufficient within the range of 0.005 - 0.02 mol/L. Filter the mobile phase using membrane filter with 0.45 μm or smaller pore size prior to use.
9. After performing reversed phase chromatography, wash the column with acid-and/or salt-free solvent first, then with acetonitrile/water=70/30 or methanol/water=70/30. Store the column with caps tightly plugged.
10. After performing normal phase chromatography, change solvent to halogen free, non-polar (n-hexane or n-heptane). Store the column with caps tightly plugged.
11. Filter the sample before injection. Avoid precipitation at injection.
12. Removal of the end filters or change of the end-fittings will result in low performance of the column.
13. Do not tighten nuts more firmly than necessary.
14. In order to maximize the column performance, minimize the dead volume in the equipment by shortening and/or narrowing the width of tubing.
15. Maintain constant column and tubing temperature.
16. Avoid injecting air, changing flow rate rapidly and changing mobile phase at high flow rate.
17. Insoluble matters from the pumping system, mobile phase, or samples trapped in the filter at the inlet of the column may increase the pressure. Placing a prefilter between the injector and the column is highly recommended to prevent column clogging.
18. Use guard column to protect both analytical and preparative type columns from irreversible adsorption on the packing material. Guard columns extend the lifetime of your valuable analytical and preparative columns.
19. In normal phase chromatography pay attention to the change of retention time depending on the water content of the mobile phase or at injection of large amount of polar solvents.
20. We recommend keeping the chromatography conditions constant, since frequent change of mobile phases will shorten column lifetime.

3. TROUBLESHOOTING

Trouble	Cause	Solution
Increase of pressure	Clogging of the end filter Clogging of the packing material Precipitation in the column	(1) and/or (2) (1) (3)
Poor resolution	Contamination of packing material Disorder of packing material	(3) Not regenerable
Split peak	Void in the column	Not regenerable
Unstable baseline (COSMOSIL PYE, NPE, Ph and PE type column)		(4)

- (1) Disconnect column from the detector. Wash with mobile phase through the column in reverse direction at half flow rate for 30 minutes.
- (2) Wash the end filter or replace it with a new one.

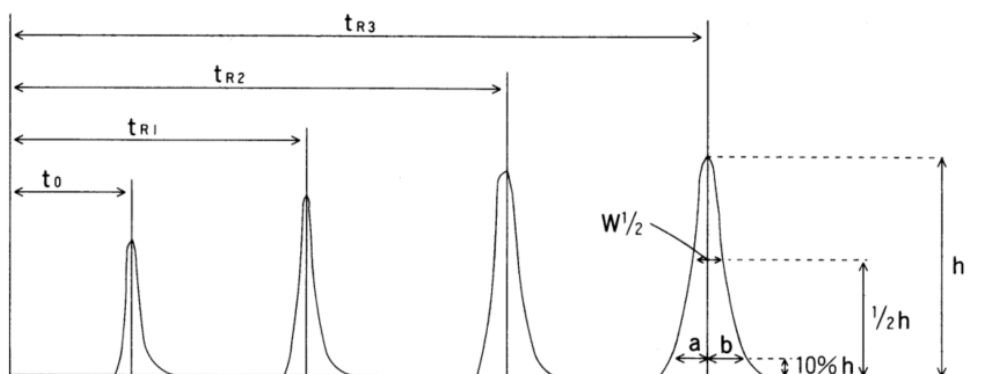
- (3) Wash the column with a solvent capable dissolving the contaminants. The column can be washed, if necessary, with water, acetonitrile, methanol, ethanol, 1-propanol, 2-propanol, tetrahydrofuran, chloroform, n-hexane and/or n-heptane.
- (4) Let through the column approximately 10 mL tetrahydrofuran.

4. PERFORMANCE GUARANTEE

The strict quality control system of Nacalai Tesque supports the customers with an individual "Inspection Report" which accompanies each and every COSMOSIL and COSMOGEL Packed Column (except guard columns) and an additional "Certificate of Analysis" for the new COSMOSIL 5C18-MS-II and 5C18-AR-II (4.6 mmI.D. x 150 mm, 4.6 mmI.D. x 250 mm).

INSPECTION RECORD

Contains data of number of theoretical plate (N), peak asymmetry (s), capacity factor (k') and separation factor (α).



N	: theoretical plate number	$N = 5.54(t_R/W_{1/2})^2$
t_R	: retention time	
$W_{1/2}$: peak half width	
h	: peak height	
s	: peak asymmetry	$s = b/a$
k'	: capacity factor	$k' = (t_R - t_0)/t_0$
α	: separation factor	$\alpha_1 = k'_2/k'_1 \quad \alpha_2 = k'_3/k'_2$

5. WARRANTY

Nacalai Tesque will change defective columns reported within 2 weeks of receipt. Nacalai Tesque approves return in case of:

- (1) Damage during the transportation caused by our incomplete packing.
- (2) Theoretical plate number measured according to the test method specified in the Inspection Report is significantly lower than guaranteed.
(Please note that the plate number decreases when using an apparatus with large dead volume or injecting a big amount of sample.)

We cannot accept claims for deterioration of column performance caused by taking off the end filters or end-fittings, or long shelf life. Return shipment is unacceptable unless we have given prior permission and shipping instructions.