Supersil Coreshell Series Chromatographic Column Instruction Manual

V1.0.2

1. Introduction

The Supersil Coreshell series chromatographic column is a new type of core-shell chromatographic column, using silica gel as the matrix with a variety of functional groups that can be bonded on the surface. The non-polar bonded phases include C18, C18 plus, C8, C4, BP, Ph, Ph plus and PFP, etc., and the polar bonded phase is CN. The particle sizes are available in 2.6 μm and 1.7 μm, which can be widely used for the rapid analysis and detection of basic, acidic and neutral compounds.

The Supersil Coreshell series chromatographic columns are for laboratory use only.

2. Column inspection

After receiving the chromatographic column, please confirm that the received chromatographic column is exactly the same as the information you ordered.

Confirm that the mobile phase direction is printed on the chromatographic column label and that there is no damage during transportation.

The storage solvent for the new Supersil Coreshell series chromatographic column is the mobile phase in the factory evaluation. Please evaluate the new chromatographic column immediately to verify its performance and record the evaluation results of the new chromatographic column.

3. Column connection

The inlet and outlet of the chromatographic column are connected according to the direction indicated by the arrow on the chromatographic column label.

The port part of the chromatographic column connecting pipe must be flat, and there should be no burrs, cut bevels and other phenomena.

Under possible conditions, the connecting pipelines at both ends of the chromatographic column should be as short as possible, and the inner diameter of the connecting pipe should be as small as possible to prevent the situation that the true column efficiency of the chromatographic column cannot be reflected due to sample diffusion.

4. Operating temperature and pH range

The pH operating range of most chromatographic columns is 2 - 9, and the pH operating range of the C18 plus and PH plus bonded phase chromatographic columns is 1 - 12.

The maximum operating temperature is 90 °C.

When the operating temperature is 60 °C, it is recommended to use a medium pH not exceeding 6 to prolong the life of the chromatographic column.

To maximize the life of the chromatographic column, when the pH is 6 - 9, the maximum temperature should not exceed 40 °C.

Avoid sudden temperature increases during use.

5. Column storage

The Supersil Coreshell reversed-phase chromatographic column should be stored in 90% acetonitrile, and the normal-phase chromatographic column should be stored in n-hexane. It can be stored in the mobile phase for a short time (3 - 4 days). If the mobile phase contains a buffer solution, in order to eliminate the corrosion of the buffer salt and ensure the re-equilibration of the chromatographic column with the original mobile phase, it is necessary to store it with the original mobile phase without buffer solution.

Before storing the chromatographic column, please ensure that the plunger is tightly sealed with the column head to avoid drying of the column bed.

The storage temperature is preferably room temperature.

6. Column application

It is recommended to use the Supersil Coreshell series chromatographic columns for the analysis and separation of basic, acidic and neutral compounds. For non-polar bonded phases, it is best to use a solution with different proportions of organic phase (methanol or acetonitrile) and aqueous phase as the mobile phase. A higher proportion of organic phase usually shortens the retention time of the compounds in the sample. The recommended operating temperature is between 40 - 60 °C to reduce the viscosity of the mobile phase and the working pressure, thus allowing the chromatographic column to work at a higher flow rate. In the gradient elution mode, it is recommended to start with an organic phase composition of 5 - 10% and then gradually increase to 100% for gradient elution, so as to quickly separate the mixture of complex samples in the shortest time.

When separating ionizable compounds (such as acids and bases), it is best to use a mobile phase with a pH of 2 - 3 and a buffer salt solution concentration of 20 - 50 mM to obtain the best separation effect and long-term stability.

7. Column maintenance

To maximize the life of the chromatographic column, please ensure that both the sample and the mobile phase are free of solids. It is recommended to add a guard column or an in-line filter with a pore size of 0.22 μm or 0.45 μm between the injector and the chromatographic column.

High-performance liquid chromatographic columns are consumables, and proper operation and maintenance are crucial to prolong the life of the chromatographic column.

(1) Precautions before using the chromatographic column

Unless otherwise specified, the storage solution of the chromatographic columns produced by our company is the mobile phase shown in the evaluation report. Before use, users must pay attention to the compatibility of the chromatographic column evaluation mobile phase and the actual mobile phase used for sample analysis. If the storage solvent is not miscible with the mobile phase to be used, isopropanol should be used for transition to avoid damage to the column.

(2) Mobile phase

The organic solvents used in the mobile phase must be chromatographically pure, and the water used in the mobile phase is preferably ultrapure water or double-distilled water in all-glassware. The buffer salt must be filtered through a solvent filter (0.45 μm filter membrane) before use. The mobile phase should be prepared freshly, and salt-containing solutions left for a long time may breed bacteria or form precipitates.

(3) Sample

Impurities in the sample are one of the main reasons for chromatographic column contamination and column efficiency decline. Complex samples can be pretreated by appropriate methods to remove impurities. The sample must be filtered through a 0.22 μm or 0.45 μm filter membrane before injection. If the sample is inconvenient to handle, it is recommended to use a guard column. Sometimes, the mismatch between the sample solvent and the mobile phase (immiscibility, polarity difference, etc.) may lead to poor chromatographic peak shape and the appearance of ghost peaks. It is recommended to dissolve the sample in the mobile phase as much as possible.

8. Problems and solutions in use

The problems that are easy to occur in the use of high-performance liquid chromatographic columns are the decline of column efficiency and the sudden rise of column pressure. The possible reasons are as follows:

(1) Filtration sieve plate contamination in column head;

(2) Contamination of column head packing;

(3) The salt in the buffer solution in the chromatographic column forms crystals and precipitates;

(4) The pH value of the mobile phase exceeds the range of use of the chromatographic column, causing the structure of the stationary phase to be destroyed or dissolved.

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