

Ion Exchange Chromatographic Column (IEC)

Instruction Manual

V1.0.2

1. Application

A series of columns with silica gel as the matrix and surface bonding SCX (strong cation exchange) and SAX (strong anion exchange) functional groups ion exchange chromatography (IEC, Ion Exchange Chromatography) packing materials.

2. Column connection

Column inlets and outlets are connected in the direction indicated by the column label arrows.

The port part of the column connection tube must be flat, without burrs and incision bevels.

If possible, the connecting tubing at both ends of the column should be as short as possible, and the inner diameter of the connecting tube should be as small as possible to prevent the occurrence of cases such as sample diffusion that does not reflect the true column efficiency of the column.

3. pH range

The pH range is 2.0-8.0.

4. Temperature range

Recommended operating temperature is not higher than 60 °C.

When using phosphate buffer solution and operating at medium or high pH value, it is recommended that the column temperature should not exceed 40 °C

Avoid sudden temperature increases during use.

5. Column storage

Overnight or short-term storage : pure water.

Long-term storage : can be stored in methanol or aqueous solution containing bacteriostatic agent *. Before storage, the chromatographic column must be transitioned with a certain proportion of organic phase / water phase, and then thoroughly cleaned to avoid residual buffer salt or sample impurities.

The best storage temperature is room temperature.

6. Column regeneration

Prolonged use and injection in buffer solution will result in reduced column ion exchange capacity. Flushing with dilute acid buffer solution (e.g., phosphoric acid solution, pH>2) can regenerate the cation column; Conversely, rinsing with dilute alkali buffer solutions (e.g., ammonia aqueous solution, pH<8) can regenerate the anion column. Each mobile phase flows through the column at least 20-30 times the column volume.

The regeneration method of the above chromatographic column is not an absolute standard method. Users can choose a suitable solvent that can dissolve the pollutants in the column to wash the mobile phase in the positive or reverse direction according to their actual experience and purpose. However, no matter what method is used to regenerate the chromatographic column, it is impossible to restore the column efficiency or other parameters to the new column level.

7. Column maintenance

High performance liquid chromatographic column is a consumable, and normal operation and maintenance are essential to prolong the life of chromatographic column.

(1) Precautions before using chromatographic column

Without special instructions, the chromatographic column storage liquid produced by the company is the mobile phase shown in the evaluation report. Before use, users must pay attention to the compatibility between the evaluation mobile phase of the chromatographic column and the actual use of the analytical sample.

(2) Mobile phase

The organic solvents used for the mobile phase must be chromatographically pure, and the water used in the mobile phase should preferably be ultra-pure water or double-distilled water for all glassware. The buffer salts must be filtered using a solvent filter (0.45 μm membrane) before use. The mobile phase should be prepared on the spot, the saline solution will breed bacteria or precipitate if it is placed for a long time.

(3) Samples

Impurities in the sample are one of the main reasons for column pollution and column efficiency decline. For complex samples, appropriate methods can be taken to pretreat and remove impurities. A 0.22μm or 0.45μm filter must be used before injection. If the sample is inconvenient to handle, it is recommended to use a protective column. Sometimes the mismatch between the sample solvent and the mobile phase (incompatibility, polarity difference, etc.) will lead to poor chromatographic peak shape, ghost peak and other phenomena. It is recommended to use the mobile phase to dissolve the sample as much as possible.

8. Problems and solutions in use

The problems that occur during the use of high performance liquid chromatography columns include a decrease in column efficiency and a sudden increase in column pressure. Possible causes are as follows:

(1) Filtration sieve plate pollution in chromatographic column head ;

(2) Chromatographic column head filler pollution ;

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

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

The solution is as follows:

When judging that the sieve plate or packing material at the column head is contaminated, the mobile phase that can dissolve pollutants can be used. Flush the chromatographic column (about 20 to 30 times the column volume, or depending on the specific situation; at this time, it is better not to connect the detector) in the opposite direction of the chromatographic column, flush the pollutants out of the chromatographic column, and then use it according to the arrow direction (flow direction) marked on the chromatographic column.

When it is judged that salt crystallization precipitates, wash the column with pure aqueous solution to dissolve and flush out all the salts in the column, and then replace it with a mobile phase containing high concentrations of methanol or other organic solvents.

If the pH value is used improperly, it is usually difficult to restore the chromatographic column.

When the above method cannot solve the problem, it is recommended to replace a new column.

9. Quality guarantee

(1) Factory inspection report

Each column undergoes strict quality inspection before leaving the factory and issues a corresponding evaluation report. The storage solvent in the ex-factory chromatographic column is pure methanol.

(2) Warranties

When you receive the column, check the outer wall of the column tube and the column efficiency immediately. If you do not have access to the guaranteed data, please contact the agent within two weeks or contact us directly. Note that the life of the

chromatographic column is related to the conditions used, the type of sample, the frequency of use, the experience of the operator, and the operating environment, there is no definite guarantee.

*Note : *, the aqueous solution containing bacteriostatic agents here generally refers to 20 % ethanol aqueous solution or 0.02 % sodium azide (because sodium azide is highly toxic, safety should be paid attention to during use, and protective measures should be taken.) aqueous solution, or other bacteriostatic agents with the same effect.*

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