CARE AND USE MANUAL

Xtimate XB-SCX HPLC Column Care and Use Manual

Welch

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Xtimate XB-SCX HPLC Column
Care and Use Manual

Dear User:

Thank you for choosing our liquid chromatography column products! This manual is designed to help you use our products under optimal conditions and maximize column lifespan. Please read the usage instructions carefully before operation.

Xtimate XB-SCX column is a strong cation-exchange bonded silica column designed primarily for the separation of metformin hydrochloride. It provides a resolution greater than 10 between melamine and metformin while ensuring an excellent peak shape for dicyandiamide, completely eliminating solvent peak interference.

Preparation Before Use

Column Identification

To ensure the quality of every column, each column sold by Welch Materials is assigned a unique identification code. This code allows us to trace quality-related issues. Upon receiving your column, please follow these steps:

1. Verify that the packaging is intact and matches the ordered column model.
2. Ensure the package contains a COA report with the inspector's signature.
3. Check the column surface for any damage and confirm that the protective plugs on both ends are intact.
4. Verify that the column body bears a Welch Materials identification label. Confirm that the model and serial number on the box match those on the column label.

Note:

The packing material inside the column is composed of fine particles. Do not attempt to open the column arbitrarily, as the material may become airborne and pose a health risk. If opening is necessary, use appropriate protective measures.

Installation

To achieve optimal column efficiency, use narrow-diameter tubing for connections. The connections to the column inlet and outlet must be tightly sealed, with the tubing ends polished and free of burrs or bevels. Use professional tools to cut and trim tubing.

1. Remove the column from its packaging. Check the direction of the eluent flow indicated by the arrow on the column body. Unscrew the protective plugs at both ends of the column. Position the column so that the eluent flow aligns with the direction indicated, as shown in Figure 1.

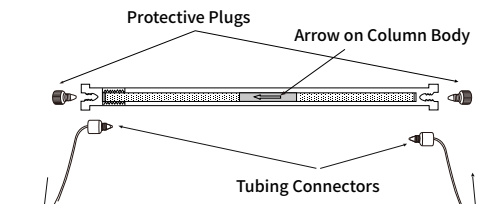


Figure 1. Column Installation

2. Carefully screw stainless steel or other compatible material fittings into both ends of the column. Ensure tight, zero-dead-volume connections to prevent leakage during operation.

Product Specifications

Column	Xtimate XB-SCX
USP Code	L9
Pore Size	120 Å
Specific Surface Area	350 m^2/g
pH Range	2.0-8.0
Max. Temperature	60 °C
Max. Pressure Tolerance	40 MPa

Note:

When using silica-based columns at pH ＞7, use buffers with concentrations not exceeding 20 mM and temperatures not exceeding 40 °C to maximize column lifespan. Extreme pH or temperature conditions can significantly reduce column durability.

Column Activation

(Recommended for new columns or those unused for over a month)

Xtimate XB-SCX columns are shipped in a solution of 50% methanol. Activation should follow these steps:

Step 1: Activation

Activation Procedure	
Specification	4.6×250 mm, 5 μm
Flow Rate	0.5 mL/min
Mobile Phase	100% Water
Time	5 hours
Temperature	30 °C

Routine Column Washing

Washing Mobile Phase	10% Methanol
Flow Rate	Method Flow Rate
Time	60 mins
Storage	Store the column in 50% methanol in water. Place in a refrigerator at a temperature of 4 °C.

Column Regeneration:

If the column exhibits increased pressure, abnormal peak shapes, reduced efficiency, or decreased resolution, please wash as follows:

Flow Rate	Method Flow Rate
Mobile Phase	100% Water → 100 mmol/L $NaClO_4$ (adjust to pH=3 with H_3PO_4) → 100% Water → 50% Methanol
Temperature	30°C
Time	80 mins each

Precautions:

1. Ion-exchange columns require longer equilibration times. It is recommended to follow the activation procedure above and then equilibrate the column overnight with the sample mobile phase at a flow rate of 0.2 mL/min.
2. When analyzing related substances, the sample concentration is relatively high, leading to broader peaks. As long as the impurities are well separated, the method is effective.
3. During formulation analysis, variations in excipients from different manufacturers may result in inadequate separation of impurities from excipients.
4. After removing the column from refrigeration, allow it to reach room temperature before installing it on the instrument and increasing the column temperature.

Glossary of Terms:

pH Range: The pH range tolerable for the column's mobile phase and sample solutions.

Specific Surface Area: The surface area per gram of silica.

Pore Size: The diameter of pores within silica particles, selected based on analyte molecular weight.

Carbon Loading: The percentage of carbon content in bonded functional groups relative to the total silica mass.

USP Code: Universal code for bonded phases in the USP chromatography column database.

Transition Procedure: A procedure to ensure miscibility between activation mobile phase and method mobile phases using transition mobile phase.

Maximum Pressure Tolerance: The upper pressure limit the column can withstand. Long-term use is recommended at pressures below 30 MPa. Monitor the instrument's pressure for safe operation.

Storage Solvent: Solvent used during storage or transport to maintain the activity of packing material. Handle with appropriate protective measures.