

Storing Cogent Diamond Hydride HPLC Columns - Tech Information

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How to Properly Store, Condition, and Maintain Cogent Diamond Hydride™ HPLC Columns

The Cogent Diamond Hydride™ column is a specialized TYPE-C™ silica-hydride stationary phase engineered for Aqueous Normal Phase (ANP), Reversed Phase (RP), and multi-mode chromatographic environments.

To ensure long column life, reproducible retention, and consistent peak shapes, proper conditioning, cleaning, and storage are essential.

This expanded guide provides a detailed, technical explanation of the procedures outlined in the original MICROSOLV Knowledge Base article.

1. Initial Conditioning Before First Use

Before running any samples, the column must be hydrated to stabilize the silica-hydride surface and establish consistent chromatographic behavior.

Procedure:

- Flush the column with 50:50 methanol / deionized water for 30 minutes.

Why this matters:

- Proper hydration ensures a stable water layer on the hydride surface, which is essential for ANP retention mechanisms.
 - This step eliminates shipping solvent residues and prepares the column for method-specific equilibration.
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2. Conditioning Procedures Based on Sample Type

A. Biological Samples (urine, plasma, serum, tissue extracts)

These matrices contain proteins, phospholipids, lipids, and other strongly retained components.

Recommended routine conditioning:

- Flush with 80% acetonitrile / 20% DI water + 0.2% acetic acid (or 0.1% formic acid) for 20 minutes.
- After every 10 injections, clean with 50:50 methanol / water for 5 minutes.

Rationale:

- High-organic solvent with weak acid enhances removal of matrix debris and prevents hydrophobic fouling.
 - Frequent short cleans minimize buildup before it becomes performance-impacting.
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B. Standard Samples (small molecules, routine QC)

These samples generally produce fewer strongly retained residues.

Recommended routine conditioning:

- Same as biological sample conditioning:
- 80% acetonitrile / 20% DI water + 0.2% acetic acid (or 0.1% formic acid) for 20 minutes.
- Clean every 100 injections, or sooner if performance drifts, using 50:50 methanol / water for 5 minutes.

Rationale:

- Consistency across methods allows predictable surface equilibration.
 - Infrequent contamination risk still warrants periodic cleaning.
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3. Recommended Storage Conditions

Proper column storage prevents drying, microbial growth, and stationary-phase degradation.

A. Long-Term Storage

- Store in 100% acetonitrile.
- Rinse with 10 column volumes before sealing.

Why:

- Pure acetonitrile inhibits microbial growth and ensures a fully organic environment that protects the hydride surface.

B. Medium-Term Storage

- Store in 90:10 acetonitrile / DI water containing 0.1% formic or acetic acid.
- Rinse with six column volumes before sealing.

Why:

- Suitable when switching between aqueous and non-aqueous phases more frequently.
 - Maintains hydration without risking buffer crystallization.
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4. Removing Adsorbed Compounds (Deep Cleaning)

Over time, strongly retained sample components may adsorb to the stationary phase, reducing efficiency or increasing back-pressure.

Primary Cleaning Method

- Rinse with 50:50 methanol / water + 0.1% formic acid

- Duration: 60 minutes
- Use a reduced flow rate compared to analytical runs.

Secondary (Overnight) Cleaning if Performance Requires Further Recovery

- Flush with 50:50 isopropyl alcohol / DI water + 0.1% formic acid
- Run overnight at low flow rate.

Reverse-Direction Cleaning (Advanced Recovery)

- Uninstall column and reinstall in the reverse flow direction.
- Wash with 50:50 methanol / DI water + 0.1% formic acid for 60 minutes.

Purpose:

- Reverse flow dislodges material trapped at the inlet frit or top of the bed.
- Acidified solvents dissolve hydrophobic and ionic contaminants.

5. Critical Handling Rule: Never Allow the Column to Dry Out

- The column must remain filled with solvent at all times.

Why this is critical:

- Drying causes crystallization, bed deformation, and irreversible loss of performance.
- TYPE-C™ surfaces rely on hydration equilibria that are disrupted by dryness.

**Never let the column dry out.
Use correct end plugs when storing the column.**



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