Using IntegraFrit™ Sample Traps with the Upchurch™ Sample Trap Column Assembly

IntegraFrit™ sample traps work with the UpChurch Scientific® Sample Trap Column Assembly to concentrate and purify LC-MS samples. **Proper assembly technique is critical to achieving a good seal and avoiding leakage.**

IMPORTANT: These instructions have been revised to accommodate recent modifications to the Upchurch Sample Trap Assembly hardware. Please read all instructions carefully before using the sample trap assembly to avoid damage to both columns and the assembly.

WARNING: Handling of fused-silica tubing and emitters can result in serious personal injury, including skin and eye injury. Use safety glasses or goggles meeting ANSI Z87.1-1989 requirements or the equivalent. Powder-free, puncture- and chemical-resistant gloves should be worn at all times.

Preparing the IntegraFrit Column for Insertion

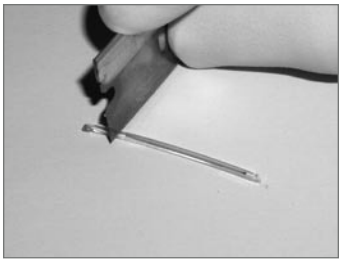

FIGURE 1

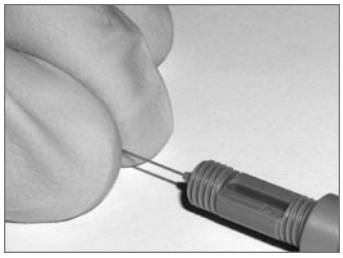

FIGURE 2

1) Using a razor blade or scalpel, carefully cut both ends of the protective sleeve around the IntegraFrit column without cutting into the fused silica column (Figure 1)
2) Using fused silica tubing, push the column out of the sleeve (Figure 2)

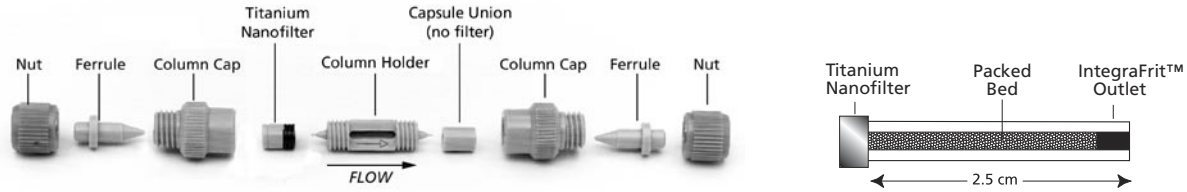

FIGURE 3

Product Description

The IntegraFrit™ Sample Trap contains multiple parts and is assembled using the component sequence illustrated in Figure 3.

Located in the center, the column holder contains an interior channel through which the IntegraFrit column is inserted; the arrow next to the channel indicates flow direction. A titanium nanofilter is located prior to the column holder (inlet), and a capsule union is inserted on the outlet side of the column holder inside the opposite column cap. Both sides of the sample trap contain a ferrule followed by a nut.

Initializing New Nanofilter Capsules for Use

Nanofilter capsules must be pre-swaged prior to use with the sample trap assembly in order to provide a proper seal and without damaging the sample trap column. Failure to do so may result in leaking, crushed fused-silica and contamination of the nanofilter.

You will want to have an old, or unusable column holder on hand as a swaging tool.

1) Without inserting any tubing, place a new, unused nanofilter into one of the assembly end caps. Insert an EMPTY column holder into the end cap and tighten the fitting until very snug. You may notice a slight audible cracking sound.
2) Loosen and remove the column holder. The nanofilter is ready to be used.

NOTE: The column holder used to perform the swage is now unusable, as compression of the ferruled-end has effectively sealed the through-path. Retain this column holder for future nanofilter swaging.

Inserting the IntegraFrit™ Column

The IntegraFrit™ column, complete with its packed bed and fritted outlet, is specifically designed for the sample trap assembly. It arrives in a ready-to-use form with no need for cutting or adjustment.

1) With the flow arrow pointing to the right, remove both column caps with the ferrules, and nuts still attached
2) Insert the clear (fritted) end of the IntegraFrit column into the column holder so it enters in a direction parallel to the arrow (Figure 4)

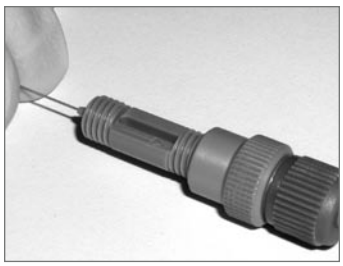

FIGURE 4

NOTE: The fritted end contains no polyimide coating and is fragile.

3) Inspect the outlet end of the column holder so the frit end of the column slightly protrudes (Figure 5)

FIGURE 5

Sealing the Column in the Column Holder

1) With the IntegraFrit™ column in place inside the column holder, insert the capsule union onto the outlet end of the column cap as shown in Figure 6. Place an end cap over the capsule union, and screw onto the column holder only until minimum resistance is felt. (The sample trap column inside the column holder must be able to rotate within the column holder and end cap.)
2) Insert the nanofilter onto the inlet end of the column cap as shown in Figure 7. Place the second end cap over the nanofilter and tighten securely onto the column holder. This end should be fully tightened (Figure 8).
3) Proceed to tighten the end cap on the outlet end of the assembly until fingertight (Figure 9).

CAUTION: Prematurely tightening the outlet end of the trap results in poor sealing and leakage and can cause damage to the column.

4) Inspect the channel for a slight bend in the IntegraFrit column. This indicates a successful watertight seal (Figure 10).

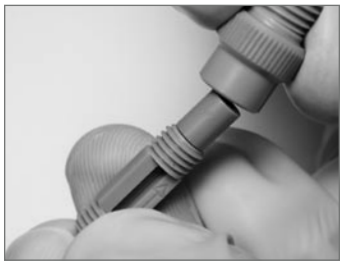

FIGURE 6 Set the capsule union on the inlet end of the column holder. Cover with an end cap and very loosely tighten.

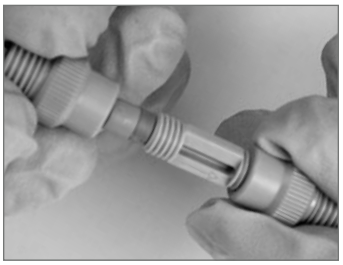

FIGURE 7 Set the nanofilter on the outlet end of the column holder assembly. Cover with the second end cap.

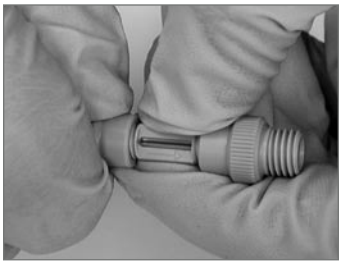

FIGURE 8 Gripping the column holder, securely tighten the end cap containing the nanofilter (inlet end of the assembly)

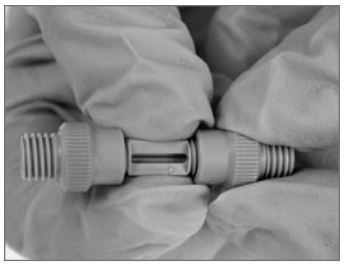

FIGURE 9 Gripping the column holder, securely tighten the end cap on the outlet end of the assembly

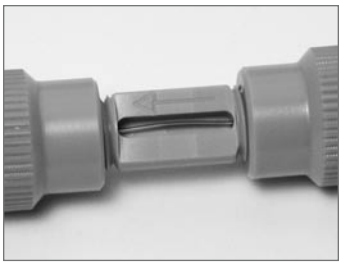

FIGURE 10 A slight bend in the installed column indicates a successful seal

Installing the Sample Trap in Your System

1) Thread a segment of fused silica tubing through the nut and ferrule until the end of the tubing protrudes from the pointed end of the ferrule
2) Insert Ferrule into the end cap
3) Press lightly against the fused silica so it butts against the inside of the end cap
4) Tighten the nut around the fused-silica tubing while holding the end cap so the cap does not move (Figure 12)
5) Repeat Steps (1)-(4) for the other side of the sample trap assembly

FIGURE 11

FIGURE 12