Using Trap'nTips™ for Offline Sample Purification

Trap'nTips™ provide the combined advantage of aspirating liquid samples directly into a pipette tip followed by immediate sample desalting and concentration onto an inner coating of reverse-phase sorbent. The Trap'nTip's novel capacity for offline LC-MS facilitates manual aspiration-expulsion cycles with increasing organic modifier concentrations and subsequent MS analysis by static nanospray.

Product Description

The Trap'nTip is comprised of a standard gel-loader pipette tip containing one of three reverse-phase sorbents adsorbed to the inner wall; New Objective offers Trap'nTips containing C18, carbon, and a C18/carbon moiety. Figure I illustrates components of the Trap'nTip.

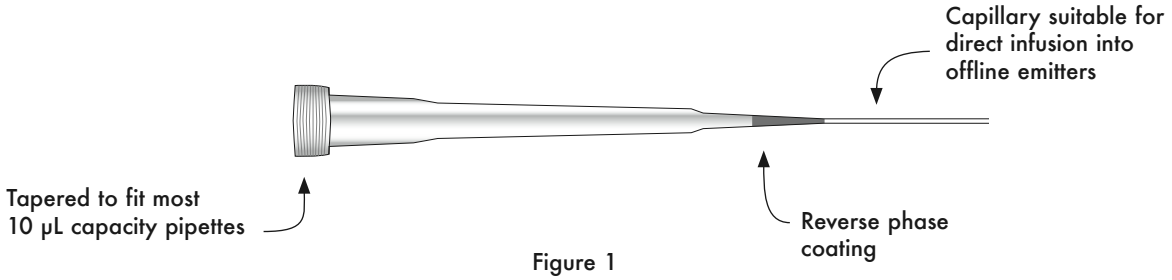

Figure 1

Tip Conditioning

Trap'nTips™ require a brief conditioning step before sample loading. Trap'nTip conditioning requires both binding solution (~2% organic modifier) and an eluent (10-60% organic modifier). New Objective recommends the Trap'nTip conditioning procedure below.

1.) Aspirate and expel five consecutive 10 µL aliquots of eluent into the Trap'nTip.
2.) Follow eluent flush with five consecutive aspiration/expulsion cycles of 10 µL binding solution (2% organic modifier).

Sample Loading

Trap'nTips™ are ready for sample loading immediately after conditioning. The following steps illustrate the sample-loading procedure.

1.) Aspirate 10 µL sample onto the Trap'nTip coating and expel into a waste receptacle. Repeat ten times.
2.) With analyte bound to the tip, desalt by aspirating 10 µL binding solution and expelling back into the sample vial. Repeat ten or more times.

Loading a PicoTip® Using the Trap'nTip™

Trap'nTips™ can be used to load sample into any New Objective Offline PicoTip®. The following steps describe filling a PicoTip with the Trap'nTip.

1.) Aspirate 2 µL eluent into the Trap'nTip™ containing loaded sample
2.) Insert the end of the Trap'nTip into the distal end of the PicoTip
3.) Exert slow pressure on pipette plunger to empty sample into the PicoTip
4.) Invert loaded offline emitter and allow the self-filling capillary action of the PicoTip® to guide the liquid sample to the tip
5.) Mount the offline emitter onto the nanospray source with voltage supply
6.) Proceed with static nanospray analysis

Figure 2 Trap'nTip™ fitted onto 10 µL pipette

Offline Chromatography with the Trap'nTip™

The presence of reverse-phase sorbent permits the use of Trap'nTips™ in manual chromatographic separations. For analytes loaded onto the Trap'nTip, aspirating and expelling eluents of different organic modifier concentrations through Trap'nTips produced excellent peptide separation ability[1].

Figure 3 Sample loaded into the Trap'nTip

The procedure below illustrates how to employ the Trap'nTip in the offline chromatographic separation of a peptide. This manual gradient begins with an eluent of low organic modifier concentration (i.e. 10% ACN) and concludes with an eluent of higher organic modifier concentration (i.e. 60% ACN).

1.) Repeat the conditioning and sample-loading procedures previously outlined
2.) Repeat steps 1-6 under *Loading a PicoTip® Using the Trap'nTip* with an eluent containing 10% organic
3.) For the same Trap'nTip, repeat steps 1-2 above using eluents of successively higher organic concentrations (i.e. 20%, 40%, 60%)

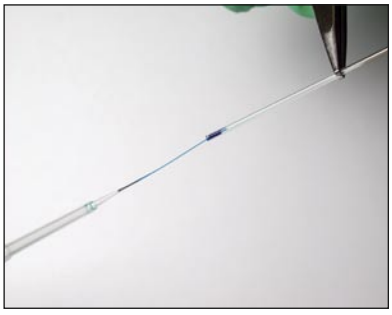

Figure 4 Insert the Trap'nTip into the distal end of the PicoTip®

For more information on filling New Objective offline nanospray emitters, please refer to Tech Note PT-1 "Tips on Tips: Using Offline PicoTips®."

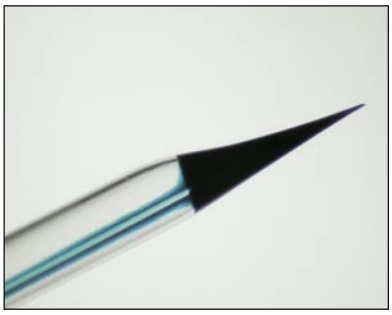

Figure 5 Capillary action draws the sample into the tip-end of the PicoTip emitter

Reference
1. Toher, C.J.; Perala, A.W.; Shukla, A.K.; Valaskovic, G.A. "Sample Purification for Static Nanospray MS Using Wall-Coated Pipette Trap'nTips," Poster presented at American Society for Mass Spectrometry, San Antonio, TX, **2005**.