

## PicoFrit® Mounting Adapter for the QSTAR® Electropray Source

The ADPC-PRO kit enables the use of industry-standard PicoFrit® columns with your existing QSTAR® nanospray stage. The integrated sheath gas module provides for the use of coaxial sheath gas when using PicoFrit columns or TaperTip™ emitters from New Objective. Just thread the PicoFrit or TaperTip (distal end first) through the sheath gas tee and mount the tee on the XYZ platform. Electrical contact is made at the distal end of the PicoFrit column inside the uncoated tip module (UTM) which is easily mounted to the platform on the XYZ stage.

For safety reasons, this module is not compatible with standard- or distal-coated PicoTips®.

**WARNING:** Electropray ionization involves the use of potentially lethal high-voltage electrical current. Observe all manufacturers' safety recommendations in the use of such equipment. No equipment modifications should be made except by trained personnel using methods approved by the manufacturer in accordance with all safety requirements. Installation of equipment should be performed by qualified personnel in accordance with all applicable electrical codes.

Never use this product with defective, damaged, or faulty equipment. Serious injury or death could result.

**WARNING:** Only qualified personnel should use this product. Provide a safe workplace equipped with all necessary safety equipment.

**CAUTION:** 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. Puncture- and chemical-resistant gloves should be worn at all times.

### Adapter Assembly

Before installing the ADPC-PRO slide the Protana source away from the source inlet and turn all voltages off.

#### Mounting the Adapter Plate to the XYZ Stage

- 1) Slide the ADPC-PRO adapter onto the metal rail located on the left side of the XYZ stage (Figure 1).
- 2) Using a hex key, lock the adapter into place by tightening the two 4-40 set screws as shown in Figure 2.

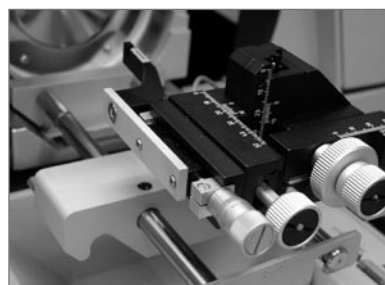


FIGURE 1

#### Mounting the Sheath Gas Tee Holder

- 1) Fasten the Sheath Gas Tee holder on the source arm using a thumb screw (see Figure 4).

#### Loading a Column into the Sheath Gas Module

- 1) Locate the Sheath Gas Tee.
- 2) Loosen the nut securing the SealTight™ fitting by one-half to two turns and feed a PicoFrit® or TaperTip™ through the PEEK™ nozzle, distal end first, until it comes through the SealTight sleeve (Figure 3).



FIGURE 2

- 3) Pull the distal end of the emitter through the sleeve until the tip protrudes 0.5 to 2 mm past the end of the PEEK nozzle. Tighten the nut to lock the tip in place and ensure a gas-tight seal.
- 4) Load the stainless steel tee into the sheath gas mounting fixture with the tip-end protruding towards the inlet of the mass spectrometer as shown in Figure 4. Tighten the set screw (on the right-hand side of the fixture) so that the tee is held firmly in place.

### Loading the Column into the UTM

High voltage will be applied through the uncoated tip module (UTM) to the distal end of the emitter.

- 1) If the UTM is not currently fastened to the adapter plate, fasten it to the plate using the long screw, as shown in Figure 5.
- 2) Remove the cover of the UTM using the thumb screw.
- 3) Trim the distal end of the TaperTip™ or PicoFrit® and connect to the MicroTee included with the UTM. See next section for further instructions on loading the MicroTee .
- 4) The other end of the MicroTee should be connected to your sample injector or mobile phase pumping system with fused-silica tubing.
- 5) Place the MicroTee into the UTM (Figure 6), replace the cover, and lock it into position.

**WARNING:** Reduce gas pressure to ambient before connecting to sheath gas line. Prior to pressurization, make sure components are tightened to specifications to prevent separation during use.

- 6) Connect the 1/16" OD sheath gas line to your mass spectrometer's sheath gas supply line. (Figure 7)
- 7) Reconnect the ESI high-voltage cable to the UTM (Figure 8). Carefully slide your nanospray source into the operating position. Use caution to make certain that the tip does not contact the mass spectrometer inlet before locking your source into operating position.
- 8) Adjust the position of the XYZ stage if necessary. You are now ready to initiate operation.

### Plumbing the MicroTee

The MicroTee joins the PicoTip® to the transfer line and supplies the high voltage.

- 1) Remove the MicroTee from the UTM. Orient the MicroTee so that the platinum electrode is facing away from the user and the setscrews are visible. Unscrew the nuts on each side and remove the black ferrules from the posts of the MicroTee.

**WARNING:** Do not loosen the setscrews or remove the electrode cap, as this may damage the electrode. The solvent will not become charged and an electrospray will not form.

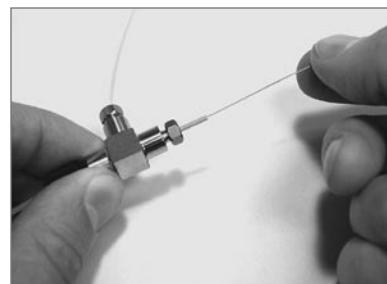


FIGURE 3



FIGURE 4



FIGURE 5

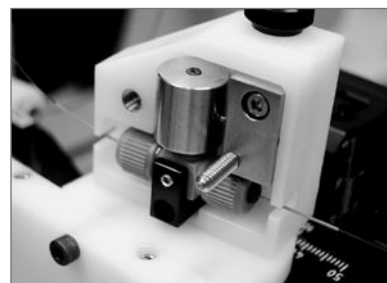


FIGURE 6

- 2) Thread the end of the transfer line tubing through a green MicroTight® sleeve, which is used for assembly with 360 µm OD tubing. Make sure the fused-silica transfer line does not extend past the tubing sleeve end that will be inserted into the MicroTee. Thread the sleeved transfer line through the fitting nut and a black ferrule (Figure 9A).
- 3) Cleave the end of the fused-silica transfer line after the tubing is threaded through the sleeve, nut, and ferrule. Slip the end of the tubing through the right post of the MicroTee, as viewed in Figure 9B, until the tubing and sleeve seat against the bottom ledge inside the post. Screw the nut finger-tight onto the MicroTee.
- 4) Insert the distal end of the PicoTip through a green MicroTight sleeve, then through the nut and the black ferrule, as shown in Figure 9C. Carefully trim the end of the PicoTip. Refer to the accompanying Technote FS-1 for proper method of cleaving fused silica. After trimming, insert the assembly back into the MicroTee, seat the PicoTip, ferrule, and sleeve against the transfer line, and finger-tighten the nut, as shown in Figure 9D. Gently pull on the tubing ends to ensure the connection is tight. Check for leaks by running solvent through the tubing at the expected operating pressure. Leaks will be apparent if solvent collects at the exposed ends of the sleeves.

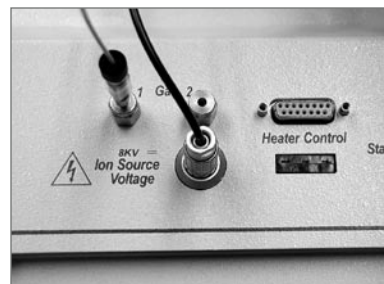


FIGURE 7



FIGURE 8



FIGURE 9A



FIGURE 9B



FIGURE 9C



FIGURE 9D

### Tuning Hints

- For initial setup and system parameter tuning (sheath gas flow, ESI voltage, emitter position), it is best to work with a well characterized standard. Delivery of a standard by continuous infusion is preferred, as this method provides sufficient time to optimize each parameter.
- Sheath gas is best used with the emitter mounted at an angle to the MS inlet.
- Use the minimal amount of sheath gas to achieve the desired effect. Too high a gas flow setting will reduce ion current, reducing sensitivity.
- Using sheath gas will change both the optimal emitter position and the ESI voltage. Optimal emitter location is usually farther from the MS inlet (typically 20-30% greater than the non-sheath set point).
- Optimal settings will be a function of mobile-phase flow rate. Higher mobile-phase flow rates will typically require more sheath gas and higher operating voltages.
- Optimal settings will also be a function of mobile-phase composition. For use with gradient chromatography, it is best to optimize conditions using a standard prepared in an average mobile-phase elutant, such as one prepared with 20% organic cosolvent.

PEEK is a trademark of Victrex plc. QSTAR is a registered trademark of Applied Biosystems, Inc. PicoTip, TaperTip, PicoTip Powered, and PicoFrit, are trademarks or registered trademarks of New Objective, Inc. All other trademarks are the property of their respective owners. The information contained in this circular is believed reliable and accurate; however, nothing set forth herein constitutes a warranty or representation of any kind or nature. ©2004 New Objective, Inc. All rights reserved.