

MS CLEANING

1) Go to the Tune program and turn the instrument on.

2) Go to the instrument control tab and set HESI at:

Sheath gas flow rate: 50

Aux gas flow rate: 15

Sweep gas flow rate: 1

Spray voltage: 3.50

Capillary temp. (C): 80

S-lens RF level: 50

Aux gas heater temp. (C): 0

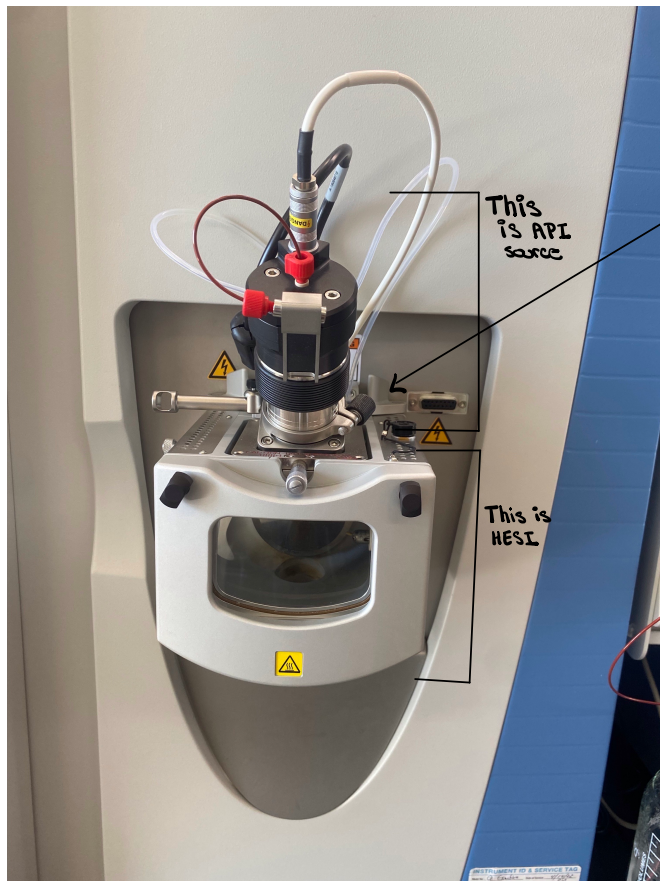
Note: the numbers will be in grey when you change them, you need to press apply

3. Wait until API source temperature falls below 100 degrees Celsius.

4. Place the machine on Standby. Remove tubing (vacuum) below HESI. Detach API source and HESI probe. A warning message will appear. Remove each sweep cone; use a fine screwdriver to loosen the three screws holding the sweep cones in place. Use a kimwipe to hold and place each cone (QEF1 and QEF2) in a beaker. Keep QEF1 and QEF2 sweep cones separate and label beakers so as not to mix which one is which.

5. Remove ion capillaries; use a special tool. Place each in separate labeled beakers (QEF1 and QEF2). Use back up cleaned capillary and insert into place. Put API source back on. Warning should disappear indicating electronics are connected properly.

Steps 4 + 5



These latches are on both sides — turn them to be able to remove HESI

Removing Sweep Cone + Ion Capillary



Note: use Kimwipe if you need to touch

- 1) Unscrew sweep cone using small screwdriver (3 places to unscrew)
- 2) Use special tool to unscrew ion capillary then use tool to slide under and pull out



Sonication

First clean water bath. Drain water into bucket. Spray inside of water bath with 70% ethanol and wipe all surfaces. Then fill bucket with distilled water to pour into water bath. Drain the distilled water. Finally, fill bucket again with distilled water and pour into water bath. You don't need a lot of water, just enough that the sweep cones and ion capillaries in their individual beakers can be submerged.

Sonication and Cleaning for Sweep Cones

1. Cover each sweep cone with 50/50 MetOH water—can use graduated cylinder to measure approximately 150 mL methanol and 150 mL water then swirl to mix and split evenly in the two beakers containing the individual sweep cones. Sweep cones should be submerged by mixture. Sonicate cones in water bath for 20 minutes. Carefully discard methanol/water mixture into designated hazardous waste container. Be careful not to lose the small screw on the side.
2. Cover each sweep cone with 100% methanol and sonicate in water bath for 20 minutes. Carefully discard methanol into hazardous waste.
3. Dry sweep cones under nitrogen gas. Pull tube that connects to needles and use to dry, without touching the tube to the sweep cones. Assemble sweep cones back onto correct machine; use kimwipe to hold and screw to tighten. Do not overtighten screws.

Sonication and Cleaning of Ion Capillary

1. Cover ion capillary in 25% Formic acid. Sonicate ion capillary in a water bath for 30 minutes.
Carefully discard formic acid into corresponding hazardous waste container.
2. Cover ion capillary in 100% LC-MS grade acetone and sonicate for 5 minutes. Carefully discard acetone into designated hazardous waste containers.
3. Cover ion capillary in 100% methanol and sonicate for 5 minutes. Carefully discard methanol into hazardous waste.
4. Dry ion capillary under nitrogen gas. These ion capillaries get stored into a backup container until subsequent cleaning day.

NOTE: Sweep Cone and Ion Capillary Sonication steps can be performed in parallel.

At the end of cleaning go to file and select load tune file. Then select the correct tune file and begin calibration.

NOTE: MS cleaning and LC cleaning can be done simultaneously.

Sonication Steps

After removal, use Kimwipe to place sweep cone and ion capillary in beakers



Label beakers according to the MS to which they belong (QEF1 or QEF2)



Red Circle: weight on beakers

Clean Injection Needles, to keep them submerged

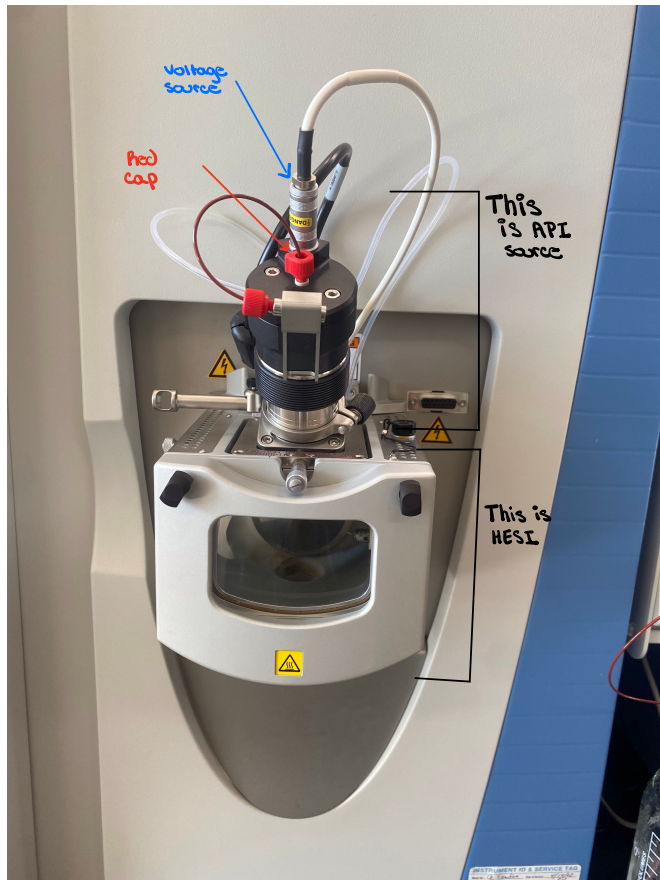
Simultaneous Sonication

- 1) Fill all beakers with respective first cleaning solution. Sonicate for 20 minutes.
- 2) Take out beakers with sweep cones to exchange cleaning solution. Put back in water bath and sonicate for 10 minutes.
- 3) Take out beakers with ion capillaries and exchange cleaning solution. Put back in water bath and sonicate for 5 minutes.
- 4) Repeat step 3.

Note: Do not need to do this every time cleaning occurs, but every once in a while and especially if calibration is wonky, this is an important first step.

1. Unscrew red cap on top of API source.
2. Detach high voltage.
3. Use a little screwdriver to unscrew the two screws on the black cap of the API source. Carefully remove black cap (use both hands so not pulling too much on the API source).
4. Twist plastic top to unscrew and remove injection needle. Once unscrew, pull straight out so as not to bend injection needle.
5. To clean injection needle, spray ethanol in Kim wipe and place needle in wipe in between your fingers and twist to clean.
6. Carefully place injection needle back in the hole (there are actually two holes, so you may need to gently tap around once you're through the first hole to correctly push the needle all the way through).
7. Twist to tighten and put injection needle in place (you should be able to see it peeking out in HESI). The plastic end of the needle must be either perpendicular or parallel for the cap to go on correctly.
8. Place the black cap back on and screw in screws. Alternate screwing in each screw a little at a time to get an even tightening.
9. Reattach high voltage.
10. Fill needle with short tubing with ACN and put through red cap tubing before screwing it back into place. This sort of cleans that tubing and allows you to feel for any sort of blockage of flow that may be occurring.
11. Screw back in the red cap on the top of the API source.

Access + Clean Injection Needle



Injection Needle

Access

1) Detach voltage source

2) Unscrew red cap



Clean in Kim wipe



Push methanol through
and feel for any resistance,
indicating potential blockage

