# UCD CSN Technical Information #402D

# Troubleshooting

***Chemical Speciation Network***
***Air Quality Research Center***
***University of California, Davis***

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# 1. PURPOSE AND APPLICABILITY

The subject of this technical information document (TI) is troubleshooting issues encountered during carbon analysis of quartz fiber filters.

# 2. SUMMARY OF THE METHOD

Procedures for resolving common issues that may arise during daily operation of the carbon analyzers are outlined.

# 3. DEFINITIONS

**He+Ox:** Oxygen premixed with helium gas.

**Helium (He):** Gas used for carbon analysis.

**Hydrogen (H):** Gas used for carbon analysis.

# 4. HEALTH AND SAFETY WARNINGS

Not applicable.

# 5. CAUTIONS

Not applicable.

# 6. INTERFERENCES

Not applicable

# 7. PERSONNEL QUALIFICATIONS, DUTIES, AND TRAINING

Only trained lab personnel designated by the Laboratory Manager may operate instrumentation in the carbon laboratory.

# 8. EQUIPMENT AND SUPPLIES

Not applicable.

# 9. PROCEDURAL STEPS

1. **FID turns off during sample analysis**
   Click on “Cancel Run” on the software and re-ignite the FID. If the analysis is at “Safe to put in a new sample”, “Purging offline” or “Purging online” stages, the sample temperature should not have increased from room temperature yet, but double check to confirm. In that case, the filter punch is not destroyed and is good for new analysis after FID re-ignition. If FID is off *after* the “Purging online” stage, a new punch should be loaded into the instrument. Make a note in the paper logbook stating “FID turned off

during Sample xxxxx (ID #). A new punch is (or is not) taken". Add the lab flag "LE-1" and add a comment to the filter through the CSN Webapp.

2. **Oven pressure below threshold values**
   The software will display a warning message if the initial pressure or the pressure at the "Purging Online" stage is not met. The analysis will pause at this point. Re-adjust the ball joint and the clamp to get a good seal and the analysis will resume automatically once the threshold value is met.

3. **Sample punch is dropped outside the Sample Punching Area**
   Make a note on the paper logbook stating "Sample xxxxx (ID #) dropped on XXX (specify the location)". Carefully pick up the punch with metal forceps and load it into the instrument. Add the lab flag "LE-2" and add a comment to the filter through the CSN Webapp.

4. **Quartz spoon dropped during loading/unloading**
   Carefully examine if the spoon is broken. If there is no damage, slide the spoon into the instrument without a filter punch and close the oven door. Click on "Action" menu and select "Clean oven". After finishing, slide the spoon backwards into the oven and repeat the "Clean oven" cycle. If the spoon is damaged, notify the lab manager for a replacement spoon. Clean the new spoon as stated above before analysis.

5. **Quartz spoon flips and sample punch dropped inside the oven during loading/unloading**
   Try to retrieve the sample punch with the spoon. If successful, slide the spoon in backwards and close the oven door. Click on "Action" menu and select "Clean oven". When finished, take a new punch from the same filter and start the analysis. Add the lab flag "LE-2" and a detailed comment to the filter through the CSN Webapp. If unsuccessful, do not proceed and notify the lab manager.

6. **Typed in wrong Sample Name, Punch Area, or Operator's initial**
   The operator will make a note on the logbook stating "Sample xxxxx (ID #) name (or punch area or operator's initial) typed in wrong as XXXXX". The lab manager will correct the file name (or punch area or operator's initial) in the raw txt file at the end of day after finishing the analysis.

7. **Filter integrity issues**
   Add the lab flag "FI-1/2/3/4" and a detailed comment about the issue to the filter through the CSN Webapp. If possible, avoid the area that has filter integrity issues when taking the punch.

8. **Accidentally opened oven door while it's still hot and analyzing**
   Immediately click on "Cancel Analysis", leave the oven door open and notify lab manager. The lab manager or trained staff will examine if any water condensation collected near the quartz oven opening and will carefully wipe away any condensed

water. Remove the front oven thermal couple following the instruction manual and let the instrument dry out for at least 30 min. DO NOT put the quartz oven door back on until the dry-out process is completed.

9. **Laser replacement**
   Follow the shutdown instructions to turn off the methanator oven, back oven and the analyzer. Take the top cover of the analyzer off and set the FID box on top of the analyzer so that the laser readings are on. Loosen the screw that secures the laser in its housing and carefully disconnect the old laser. Put the new laser in and reconnect the wire. Turn on the main switch of the analyzer but keep back oven and methanator oven off. Watch the reflectance and transmittance signal readings on the software and slightly rotate the laser head to optimize the readings. The laser readings with a clean filter punch in the oven should be > 10000. Once achieved, screw in the laser and put the cover back on. Follow the start-up procedures to restart the back oven and methanator oven.

## 10. QUALITY ASSURANCE AND QUALTY CONTROL

Not Applicable.

## 11. REFERENCES

Not Applicable.