GC Procedure 2008

Turn on the GC before leaving for the field (follow these steps)

1) Start Helium flow – Open only horizontal knob to the right of the regulator – regulator on the left should read near the red mark (80 psi) and two carrier gas dials on the side of the GC should read at marks.
2) Make sure the following readings are set correctly:
    a. Inj./Det. Temp. = 110
    b. Column Temp. = 45
    c. Attenuation = 16
3) Turn on GC
4) Set current to 160 – turn up slowly, wait 1 second between clicks.
5) Start recorder

Check the tip and change if needed.

Run Helium –

1) Attach one end of long tubing to helium tank, turn on a light helium flow.
2) Attach other end of tubing to the GC intake.
3) Charge
4) Open 1
5) Open 2
6) Allow helium to flow for twenty seconds.
7) Close 1
8) Wait three seconds.
9) Close 2
10) Discharge
11) Start (Let sample run at least five minutes).
12) Detach tube (Make sure helium is turned off).
13) Stop

Check uV reading – should be between -1000 and +5000 uV. If not, use zero knobs on GC to fix.

Zero – press Command, N, then Enter. Press Monit to return to screen and check that it did zero.

Check slope and record it on data sheet - check slope by pressing command, SLP Test, and then Enter. After 20 seconds slope will be reported. Record on data sheet.

Prepare DIC syringes

1) Rinse syringe three times with the sample.
2) Submerge tip of syringe and slowly draw up about 20mL of the sample.
3) Tap out air bubbles and expel the liquid until about 12 mL remains.

☼ **Remember to write on the printout which samples or standards corresponds to each set of peaks.**

Run Gas Standards

1) Rinse syringe once with standard CO_2
    a. To fill syringe attach twist end of syringe to tank. Open green knob and close it. Open white knob and allow gas to fill syringe. Remember to close white knob.
2) Fill syringe with standard.
3) Attach syringe to GC
4) Charge
5) Open 1
6) Open 2
7) Inject sample
8) Close 1
9) Wait three seconds
10) Close 2
11) Discharge
12) Start
13) Repeat five times (you can insert the next sample when the previous sample begins to peak) Make sure dials read Charge, Open, Open then insert sample Close 1 wait three seconds Close 2, and Discharge.
14) Stop (when all samples have completely eluted).
15) Record values
16) Rerun any outliers (divide lowest number by the highest number. Correlation must be within 95%).

Run Air and PCO_2 Samples

1) Inject 10 mL of room air to clear out standards and start run (charge, open 1, open 2, inject, close 1, wait 3s, close 2, discharge, start)
2) Attach first Air syringe to GC
3) Charge
4) Open 1
5) Open 2
6) Inject 10 mL of air sample.
7) Close 1
8) Wait 3 seconds.
9) Close 2
10) Discharge
11) Start
12) Repeat for second syringe.
13) Stop
14) Set timer for five minutes.
15) Rerun with remaining 10 mL if the correlation is less than 95%.
16) Follow above procedures for pCO2 syringes (except step 1)

Run DIC Samples

1) Expel water until volume is 10mL
2) Inject 200 μL of 2N H_2SO_4 directly into tip of syringe.
3) Immediately inject He gas into the syringe until the total syringe volume is 30 mL.
4) Cap the syringe.
5) Repeat steps 1-3 for 2 more syringes
6) Shake the capped syringes vigorously for 1 minute.
7) Attach 1st syringe to GC tip
8) Charge
9) Open 1
10) Open 2
11) Inject gas – about 10 mL (be careful not to inject water into the GC).
12) Close 1
13) Wait three seconds
14) Close 2
15) Discharge
16) Start
17) Repeat steps 7-15 for other syringes.
18) Stop (When all peaks have eluted).
19) Wait 5 minutes from last peak before starting next run
20) Run additional replicates if correlation is less than 95%.

Rerun Gas Standards (same as above).

Check Slope

Run Helium (same as above).

Turn Off GC:

1) Slowly turn Current to zero.
2) Turn off recorder
3) Turn off GC
4) Shut off He flow (make sure both tanks are off).

Write the Date and Name of Lake on GC printout.