# Protocol for quantifying CO2 in headspace samples with the Shimadzu GCMS-QP2010

# Equipment

* GCMS
* Shimadzu GCMS-QP2010
* Autosampler
* Shimadzu AOC-5000 Auto Injector

# GCMS start up

## WARNINGS:

* You should not need to start the floor vacuum pump (rotory pump) manually. This can be done using the GCMS software.
* If the GCMS has not been used in a while:
* Check the oil level in the rotory vacuum pump (on the floor).

## Procedure:

1. Turn on carrier gas (should be Helium)

* psi should be ~100

1. Turn on Shimadzu AOC-5000 Auto Injector

* Make sure this is done BEFORE turning on the computer!

1. Turn on computer
2. Turn on GC and MS
3. Start the GCMS Real Time Analysis software

### Next step done in GCMS Real Time Analysis software

1. Vacuum control

* Either Auto Startup or manual startup
  + Manual startup provides more control, option for safety checks, and may produce less wear and tear.
* For Auto Startup, just click
* Manual startup:
  1. Close vent valve
  2. Turn on rotory pump
  + Let the pressure drop to <3.1 pascals
  1. AFTER pressure is <3.1 pascals: turn on high pressure pump
  + A sound resembling a jet engine is normal, as long as it only lasts < a minute.
  1. Turn on ion source heater
  + GC and MS indicators in top right of screen should say 'ready'

1. Load a method or create a new method

* Make sure that GC and MS are heating up to the method's specified temps
* A batch file can then be created if needed

# GCMS tuning

## WARNINGS:

* If the GCMS has not been used in a long time (e.g., a year), wait ~1 day prior to tuning.
* This wait provides time for the column to be purged of contaminants.

## Procedure:

* Follow procedure starting on Page 21 of the GCMS-QP2010 Operation Guide.

### Leak check:

* Follow procedure outlined on Page 19 of the GCMS-QP2010 Operation Guide.

# GCMS sample processing

## Notes:

* The septum can be changed while the GC is on. The carrier gas flow will just need to be turned off very briefly prior to changing the septum.

# GCMS shut down

* Use auto shutdown or manual shutdown.
* Wait for the GC to cool before turning off the carrier gas.

# General notes

* The blue septa may provide a better seal than the green septa (for higher temps).
* The rotory vacuum oil should be changed every 6 months.